

**Date and Time:** Monday 9 September 2024 17:54:00 CEST

**Job Number:** 233037037

**Documents (29)**

1. [*Towards better social statistics for a #SocialEurope*](https://advance.lexis.com/api/document?id=urn:contentItem:5KJ4-29C1-F03R-N0R6-00000-00&idtype=PID&context=1516831)

**Client/Matter:** -None-

**Search Terms:** statistics and data or statistics and eurostat or statistics and surveys or statistics and census or data and eurostat or data and surveys or data and census or eurostat and surveys or eurostat and census or surveys and census

**Search Type:** Terms and Connectors

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| **Content Type** | **Narrowed by** |
| News | Timeline: 09 dec 2015 tot 09 dec 2016; Locatie: International; Plaats van publicatie: Europe; Taal: English |

2. [*Bureau of Statistics says economic reports could be axed without extra funding ABC chief David Kalisch says retail, housing and international trade data could be published less frequently after budget cuts*](https://advance.lexis.com/api/document?id=urn:contentItem:5KXR-6171-JCJY-G103-00000-00&idtype=PID&context=1516831)

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3. [*Sierra Leone completes 'successful' post-Ebola census*](https://advance.lexis.com/api/document?id=urn:contentItem:5HNJ-S341-DY93-M13G-00000-00&idtype=PID&context=1516831)

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4. [*Australian Bureau of Statistics to slash jobs despite census bungle Agency to cut up to 150 jobs as union says redundancies caused by budget cuts contributed to census controversy*](https://advance.lexis.com/api/document?id=urn:contentItem:5M3C-TYJ1-JCJY-G4YW-00000-00&idtype=PID&context=1516831)

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5. [*-CBSL-Economic and Social Statistics of Sri Lanka - 2016 Publication*](https://advance.lexis.com/api/document?id=urn:contentItem:5KFH-V1C1-F0K1-N193-00000-00&idtype=PID&context=1516831)

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6. [*-Call for Abstracts Announced for 2016 URISA GIS and Health Symposium*](https://advance.lexis.com/api/document?id=urn:contentItem:5J2H-B4S1-JD3Y-Y0N3-00000-00&idtype=PID&context=1516831)

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7. [*-Bank of Estonia-The anniversary of statistics in Estonia is to be celebrated with an international conference*](https://advance.lexis.com/api/document?id=urn:contentItem:5JKN-3K61-JD3Y-Y35M-00000-00&idtype=PID&context=1516831)

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8. [*Preliminary results of the June Agricultural Census 2016*](https://advance.lexis.com/api/document?id=urn:contentItem:5KJB-2Y51-F15K-23SM-00000-00&idtype=PID&context=1516831)

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9. [*IMF report endorses Argentine governments' measurement of economic growth*](https://advance.lexis.com/api/document?id=urn:contentItem:5J2R-GSK1-DYRV-34V5-00000-00&idtype=PID&context=1516831)

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10. [*Bosnian demographics expert comments on delays in census results publication*](https://advance.lexis.com/api/document?id=urn:contentItem:5J9Y-P1W1-DYRV-34R5-00000-00&idtype=PID&context=1516831)

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11. [*House of Cards —An analysis of Macao 's resident support for tourism and casino development*](https://advance.lexis.com/api/document?id=urn:contentItem:6BM4-FYP1-JBMY-H0HK-00000-00&idtype=PID&context=1516831)

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12. [*A Comparative Analysis of Contraceptive Use in Africa: Evidence from DHS*](https://advance.lexis.com/api/document?id=urn:contentItem:6BH2-VXY1-JBMY-H3X4-00000-00&idtype=PID&context=1516831)

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13. [*Bangladesh ’s stellar growth*](https://advance.lexis.com/api/document?id=urn:contentItem:5S1W-2J81-JDSH-210G-00000-00&idtype=PID&context=1516831)

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14. [*Are blue skies back?*](https://advance.lexis.com/api/document?id=urn:contentItem:5HT1-9F71-JCF5-B2JJ-00000-00&idtype=PID&context=1516831)

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15. [*Are Chinese workers compensated for occupational risk?*](https://advance.lexis.com/api/document?id=urn:contentItem:6BM3-69X1-DY41-74FK-00000-00&idtype=PID&context=1516831)

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16. [*Consumption and Population Dynamics in Nigeria : Analysis and Micro simulations using Fertility Rate Variants*](https://advance.lexis.com/api/document?id=urn:contentItem:6BM3-50R1-JBMY-H1MN-00000-00&idtype=PID&context=1516831)

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17. [*Public trust in the Chinese police: The impact of ethnicity, class, and Hukou*](https://advance.lexis.com/api/document?id=urn:contentItem:6BNK-9K41-DY41-733G-00000-00&idtype=PID&context=1516831)

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18. [*Perceived quality of private education and fears of stratification: Investigating the propositions of human capital theory by exploring the case of Colombia*](https://advance.lexis.com/api/document?id=urn:contentItem:6BNK-7DJ1-DY41-73KH-00000-00&idtype=PID&context=1516831)

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19. [*Poland in the migration chain: causes and consequences*](https://advance.lexis.com/api/document?id=urn:contentItem:6BM4-FYP1-JBMY-H3MR-00000-00&idtype=PID&context=1516831)

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20. [*Biases in multicriteria decision analysis: The case of environmental planning in Southern Nevada*](https://advance.lexis.com/api/document?id=urn:contentItem:6BGY-HK51-JBMY-H3M6-00000-00&idtype=PID&context=1516831)

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21. [*Food Insecurity and Coping Strategies: A Tale of Two Particularly Vulnerable Tribal Groups in Karnataka*](https://advance.lexis.com/api/document?id=urn:contentItem:6BM3-50R1-JBMY-H1MP-00000-00&idtype=PID&context=1516831)

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22. [*Public housing and educational attainment in Asia's global city: An empirical study of Hong Kong*](https://advance.lexis.com/api/document?id=urn:contentItem:6BGY-HK51-JBMY-H3MJ-00000-00&idtype=PID&context=1516831)

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23. [*A new co-operative revolution in South Africa ? Reflections on the outcomes of state support in the Free State Province*](https://advance.lexis.com/api/document?id=urn:contentItem:6BNK-C111-DY41-746X-00000-00&idtype=PID&context=1516831)

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24. [*The econometric analysis of retail rents in Singapore*](https://advance.lexis.com/api/document?id=urn:contentItem:5TW9-S371-DXF1-T18H-00000-00&idtype=PID&context=1516831)

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25. [*Shocking History of workhouse life was a project worth sharing*](https://advance.lexis.com/api/document?id=urn:contentItem:5HM2-8V11-JCG2-C33B-00000-00&idtype=PID&context=1516831)

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26. [*Rising prices: the high cost of living in 1916 Ireland A recently published CSO survey paints a vivid picture of the cost of living in the country a century ago. Overall, today's consumers have it much better than those of yesteryear*](https://advance.lexis.com/api/document?id=urn:contentItem:5JD7-KR91-DYS1-01KH-00000-00&idtype=PID&context=1516831)

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27. [*Oman 's increasing domestic production in agriculture and fisheries to reduce imports*](https://advance.lexis.com/api/document?id=urn:contentItem:5WS6-C4N1-DXYV-7452-00000-00&idtype=PID&context=1516831)

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28. [*Employment relations and growing income inequality: Causes and potential options for its reversal*](https://advance.lexis.com/api/document?id=urn:contentItem:6BM3-69X1-DY41-72XH-00000-00&idtype=PID&context=1516831)

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29. [*No Headline In Original*](https://advance.lexis.com/api/document?id=urn:contentItem:5JP4-8T21-DYX4-71GJ-00000-00&idtype=PID&context=1516831)

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# [***Towards better social statistics for a #SocialEurope***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5KJ4-29C1-F03R-N0R6-00000-00&context=1516831)

EU Reporter

August 24, 2016 Wednesday 12:31 PM EST

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**Length:** 1213 words

**Byline:** EU Reporter Correspondent

**Body**

Aug 24, 2016( EU Reporter: [*http://www.eureporter.co*](http://www.eureporter.co) Delivered by Newstex) Today (24 August) the European Commission adopted a proposal for a regulation on new, integrated ways to collect and use ***data*** from social ***surveys*** so as to better support policy making in general and social policy in particular.A more solid evidence base in terms of social indicators will improve the analysis of social developments and contribute to a social triple-A for Europe. As Employment, Social Affairs, Skills and Labour Mobility Commissioner Marianne Thyssen, also responsible for European ***Statistics*** (***EUROSTAT***) said: 'Today we take an important step to modernise social ***statistics***. Yet this is not about numbers, this is about people. Good policies start with good ***data***.

We need the most accurate information in the social field. We need more up to date ***data*** and receive it faster in order to design social policies that correspond to the real needs of citizens in Europe today. Today's proposal is another example of how this Commission puts the social dimension at the heart of its agenda.' The proposed framework Regulation will allow ***data*** to be published faster, as it reduces the transmission deadlines in a number of areas. It will also increase the comparability and coherence of EU social ***statistics***, by bringing together seven existing household ***surveys*** that are currently carried out in the EU and harmonizing variables that are common to two or more ***surveys***. This will, in addition, facilitate joint analysis of social phenomena, based on new ***survey*** methods. Finally, we will a richer and broader ***data*** set at our disposal, thanks to the use of innovative approaches and methods by national statistical authorities and the combination of ***data*** from several sources. Background This initiative is part of a major programme for the modernization of social ***statistics*** undertaken in close co-operation with the Member States. It addresses the increased challenges in this area of ***statistics***, which include rapid innovation in methodologies and uses of IT, the availability of new ***data*** sources, emerging needs and expectations of ***data*** users as well as continued pressure on available resources. It will also support the planned European Pillar of Social Rights[1] which requires a solid evidence base in subjects such as inequalities, skills, access to employment for all and social protection expenditures - all of which should be better described with sound and timely ***statistics***. This initiative is also part of the Regulatory Fitness and Performance Programme (REFIT) and aims to streamline the European social ***statistics*** collected from samples and to make the ***data*** collection process more efficient and the statistical output more relevant. Similar initiatives are being developed in other areas of ***statistics***, such as business and ***agricultural*** ***statistics***. Seven household ***surveys*** are targeted with this framework Regulation: the Labour Force ***Survey*** (LFS)[2], European ***Statistics*** on Income and Living Conditions (EU-SILC)[3], the Adult Education ***Survey*** (AES)[4], the European Health Interview ***Survey*** (EHIS)[5], the ***Survey*** on Information and Communications Technologies (ICT) usage in households (ICT-HH)[6], the Household Budget ***Survey*** (HBS)[7] and the Harmonized European Time Use ***Survey*** (HETUS)[8]. It should also be noted that this initiative will reduce the costs for Member States involved in carrying out sample ***surveys*** and the burden on EU residents responding to them. The Commission aims at gradually implementing the framework Regulation starting from 2019. The Proposal is the result of extensive consultations with all interested parties: ***data*** producers, ***data*** providers and ***data*** users. The results of the consultation are summarised in an impact assessment publicly available here[9]. The European Statistical System (ESS)[10] produces the statistical ***data*** used to assess Member States' performance in the context of the European semester, to monitor the key targets of Europe 2020, to implement many Commission evaluation frameworks on employment and social developments, and to pave the way for a future strategic vision for Europe beyond Europe 2020. Additionally, the Union's political priorities require good analytical and monitoring tools in the fields of jobs, growth and investment, the digital single market, a deeper and fairer European Monetary Union (EMU), migration, internal market, energy union and climate. Over the years, the ESS has set up advanced tools to provide improved and comparable ***statistics*** for better policy making at the European level and in the Member States. Nevertheless, the ESS is increasingly confronted with a growing need for statistical information for analysis, research and policy-making. Furthermore, statistical ***data*** should continue to meet the high quality standards of official ***statistics***, including timeliness. Social ***statistics*** are covering a wide range of domains (demography, employment, income and consumption, well-being and quality of life, education, health etc.) and they are taken from a variety of sources (***data*** on persons and households collected at individual level from samples, population ***censuses***, aggregated administrative ***data*** and ***data*** from businesses). All these aspects are being analysed in a consistent manner under the modernisation programme for social ***statistics***. The current proposed framework Regulation is an important step forward in the modernisation of social ***statistics*** notably in terms of social ***survey*** ***data***. More information See also MEMO/16/2868[*http://europa.eu/rapid/press-release\_MEMO-16-2868\_en.htmFor*](http://europa.eu/rapid/press-release_MEMO-16-2868_en.htmFor) more information on ***Eurostat***   [*http://ec.europa.eu/****eurostat****/Follow*](http://ec.europa.eu/eurostat/Follow) ***Eurostat*** on Twitter   [*https://twitter.com/EU\_EurostatHomepage*](https://twitter.com/EU_EurostatHomepage) of Commissioner Thyssen [11] Follow Marianne Thyssen on Facebook[12] and twitter   [*https://twitter.com/mariannethyssenSubscribe*](https://twitter.com/mariannethyssenSubscribe) to the European Commission's free e-mail newsletter on employment, social affairs and inclusion[13] Questions and Answers: Towards better social ***statistics*** for social Europe   [*http://europa.eu/rapid/press-release\_MEMO-16-2868\_en.htm*](http://europa.eu/rapid/press-release_MEMO-16-2868_en.htm) [ 1]:   [*http://ec.europa.eu/priorities/deeper-and-fairer-economic-and-monetary-union/towards-european-pillar-social-rights\_en*](http://ec.europa.eu/priorities/deeper-and-fairer-economic-and-monetary-union/towards-european-pillar-social-rights_en) [ 2]:   [*http://ec.europa.eu/****eurostat****/web/microdata/european-union-labour-force-****survey***](http://ec.europa.eu/eurostat/web/microdata/european-union-labour-force-survey) [ 3]:   [*http://ec.europa.eu/****eurostat****/web/income-and-living-conditions/overview*](http://ec.europa.eu/eurostat/web/income-and-living-conditions/overview) [ 4]:   [*http://ec.europa.eu/****eurostat****/web/microdata/adult-education-****survey***](http://ec.europa.eu/eurostat/web/microdata/adult-education-survey) [ 5]:   [*http://ec.europa.eu/****eurostat****/web/microdata/european-health-interview-****survey***](http://ec.europa.eu/eurostat/web/microdata/european-health-interview-survey) [ 6]:   [*http://ec.europa.eu/****eurostat****/****statistics****-explained/index.php/Information\_society\_****statistics****\_-\_households\_and\_individuals*](http://ec.europa.eu/eurostat/statistics-explained/index.php/Information_society_statistics_-_households_and_individuals) [ 7]:   [*http://ec.europa.eu/****eurostat****/web/household-budget-****surveys***](http://ec.europa.eu/eurostat/web/household-budget-surveys) [ 8]:   [*http://ec.europa.eu/****eurostat****/web/products-manuals-and-guidelines/-/KS-RA-08-014*](http://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-RA-08-014) [ 9]:   [*http://ec.europa.eu/smart-regulation/impact/ia\_carried\_out/cia\_2016\_en.htm*](http://ec.europa.eu/smart-regulation/impact/ia_carried_out/cia_2016_en.htm) [ 10]:   [*http://ec.europa.eu/****eurostat****/web/european-statistical-system*](http://ec.europa.eu/eurostat/web/european-statistical-system) [ 11]:   [*http://ec.europa.eu/commission/2014-2019/thyssen\_en*](http://ec.europa.eu/commission/2014-2019/thyssen_en) [ 12]:   [*https://www.facebook.com/mariannethyssen*](https://www.facebook.com/mariannethyssen) [ 13]:   [*http://ec.europa.eu/social/e-newsletter*](http://ec.europa.eu/social/e-newsletter)

**Load-Date:** August 24, 2016

**End of Document**



[***Bureau of Statistics says economic reports could be axed without extra funding; ABC chief David Kalisch says retail, housing and international trade data could be published less frequently after budget cuts***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5KXR-6171-JCJY-G103-00000-00&context=1516831)

The Guardian

October 13, 2016 Thursday 8:54 AM GMT

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**Section:** AUSTRALIA NEWS

**Length:** 574 words

**Byline:** Gareth Hutchens

**Body**

The Bureau of ***Statistics*** is considering cutting key economic ***statistics*** to absorb recent funding cuts.

David Kalisch, the head of the ABS, revealed the news on Thursday, warning retail ***data***, housing and lending finance ***data***, and international trade ***data***, could soon be published less frequently. He also admitted a slew of ***data*** could cease being collected altogether.

He said ***data*** collection of foreign ownership of ***agricultural*** businesses, industrial disputes, motor vehicle sales, livestock slaughter, and crime offenders and victims, could stop if extra funding cannot be secured.

Related: ABS says release of names linked to 5,000 businesses was 'human error'

The childhood education and care ***survey***, and the internet activity ***survey***, could also stop.

The revelation can be found in the ABS's Forward Work Program 2016-17.

Kalisch said the ABS would be forced to cut its staffing levels "significantly" over the next three years, by about 400 staff in 2016-17, 300 staff in 2017-18 and 40 staff in 2018-19, to absorb recent funding cuts.

He said the Turnbull government had agreed, in its 2015-16 budget, to give the ABS an extra $257m in funding for critical infrastructure improvements until 2019-20, but after that the ABS's budget would be cut by another 10% (worth about $25m per year).

Its average annual budget is currently $259m per year, excluding the ***census***.

Kalisch said the ABS's workload was due to expand next year, despite recent funding cuts, and that would make some ***data*** collection unaffordable within his existing budget.

The ABS would have to "free up" some resources to pay for the extra work, he said, by cutting some ***data*** collection.

"Over the last 15 years the ABS has had falling resources to deal with a bigger and more complex world to measure," he said. "In contrast, staff numbers in the wider Australian Public Service have increased during this time."

Andrew Leigh, the shadow assistant treasurer, has attacked the Turnbull government following the news, saying critical economic ***statistics*** were facing the axe.

Related: Australian Bureau of ***Statistics*** lays blame for ***census*** bungle on IBM

"The retail ***data*** is often a leading indicator of whether there's an economic downturn coming along," Leigh said.

"And we know that the housing finance ***statistics*** are critical, too. Those housing finance numbers tell us the debt load that Australians are facing and also give us an indicator as to how the housing markets themselves are tracking.

"[The ABS] deserves better than a Turnbull government that is cutting away its ability to collect the ***data*** that Australians rely on."

Following Leigh's criticism, the ABS released a statement on Thursday afternoon. It said the ABS had not made any decision about which statistical series would be cut from 2017-18.

"No decisions on the ABS' work program for 2017-18 and beyond have yet been taken," an ABS spokesman said. "Future consultation will consider our broad legislative obligations and options regarding the value, usefulness and frequency of some indicators."

The ABS was forced to apologise two months ago after websites crashed during peak time on ***census*** night. It was forced to take down the online ***census*** form website for 40 hours after distributed denial of service (DDoS) attacks.

Last month, in a submission to a senate inquiry into the ***census*** debacle, the ABS blamed service provider IBM for the disruption, saying it had not properly prepared for the risk of a DDoS attack.

**Load-Date:** October 13, 2016

**End of Document**



[***Sierra Leone completes 'successful' post-Ebola census***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5HNJ-S341-DY93-M13G-00000-00&context=1516831)

Agence France Presse -- English

December 21, 2015 Monday 6:21 PM GMT

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**Length:** 271 words

**Dateline:** Freetown, Dec 21 2015

**Body**

Sierra Leone praised its resilient population of six million on Monday for cooperating in an "exceptionally successful" nationwide ***census*** seen as a benchmark of the country's post-Ebola recovery.

Almost 13,000 surveyors fanned out across the country for two weeks up to Friday, collecting a slew of ***data*** on population demographics, housing provision, ***agriculture*** and the impact of the deadly virus.

"The ***census*** was exceptionally successful as people readily gave details to our enumerators," Sullay Kamara, the director-general of the government's ***statistics*** council, told AFP.

"When one thinks that the ***census*** came barely a month after Sierra Leone was declared Ebola-free... and many people were at the point of rebuilding their lives after the death of loved ones, we had no case of people being rude to our enumerators."

The count is seen as a key test of Sierra Leone's recovery from an epidemic that killed almost 4,000 people before the west African nation was declared free of transmission last month.

The $10.5 million ***survey*** was postponed twice because of the outbreak but finally set in stone several months ago, as the country was still fighting Ebola.

"People look at the ***census*** with hope that their living conditions will improve and that more development -- in terms of health, education and basic social life -- will improve after the devastating destruction caused by Ebola," Kamara said.

The ***statistics*** council says provisional results are expected in March, while a final report will not be available until the end of 2016.

The 2004 count put the population at 4.9 million but this is expected to rise to 6.5 million.

**Load-Date:** December 22, 2015

**End of Document**



[***Australian Bureau of Statistics to slash jobs despite census bungle; Agency to cut up to 150 jobs as union says redundancies caused by budget cuts contributed to census controversy***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5M3C-TYJ1-JCJY-G4YW-00000-00&context=1516831)

The Guardian

November 4, 2016 Friday 3:46 AM GMT

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**Section:** AUSTRALIA NEWS

**Length:** 477 words

**Byline:** Michael Slezak

**Body**

The Australian Bureau of ***Statistics*** has told staff it will be cutting up to 150 jobs, after government cuts to its budget.

In an email to staff, the ABS said it would be accepting applications for voluntary redundancy until 18 November, to take effect before 9 March 2017.

"The ABS's preference is for the [leaving] date to occur as early as possible but this can be negotiated," ABS management said in a document sent to staff.

In a statement a spokeswoman for the ABS said the staff cuts were "part of a planned approach to transform its workforce for the future".

The Community and Public Sector Union, which represents public service workers, blamed the "Turnbull government's shortsighted cuts to ongoing funding" for the job losses.

Related: Lesson of #CensusFail: continued funding cuts mean agencies can't do their job | Greg Jericho

The CPSU's deputy national secretary, Melissa Donnelly, said: "The ABS is an absolutely critical national institution. Its ***data*** is a cornerstone not just of effective government but is also extremely valuable to the private sector."

Donnelly said the CPSU was calling on the government to restore funding to the ABS and resource it properly.

Donnelly said the staffing levels of the ABS had been shrinking even before this large cut. In 2010-11 the ABS had an average of 3,030 staff, a number that dropped to 2,871 in 2015-16.

"There were significant problems around the recent ***census*** and the job cuts undoubtedly contributed to this," Donnelly said.

The ABS has had its budget cut under several governments. The ALP, under Kevin Rudd, cut its budget in 2008, resulting in the ABS halting its job vacancy ***survey*** just as the global financial crisis was about to hit the Australian economy.

The Abbott government further cut the ABS budget in 2014 and the Turnbull government continued the ongoing "efficiency dividends", which have been eroding the organisation's budget.

Donnelly said: "We are seriously concerned that the ABS is continually being forced to make decisions solely based on its meagre budget. The bureau needs adequate funding to provide robust, accurate ***data*** and that's clearly not currently the case.

"These job cuts have been announced just weeks after the ABS admitted budget pressures were also forcing it to consider scaling back its collection of retail and housing ***data*** and scrapping altogether ***statistics*** ranging from prison and ***agricultural*** ***data*** to car sales and lending finance."

The ABS spokeswoman said: "With the government's $257m investment to modernise the ABS's ageing IT systems and processes, the agency will achieve efficiencies and require fewer staff in coming years. As the ABS shifts from manual processes and identifies efficiencies, staff with skills that are not essential for the future [including staff in roles that are no longer required] may apply for packages."

**Load-Date:** November 4, 2016

**End of Document**



[***-CBSL-Economic and Social Statistics of Sri Lanka - 2016 Publication***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5KFH-V1C1-F0K1-N193-00000-00&context=1516831)

ENP Newswire

August 12, 2016 Friday

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**Length:** 334 words

**Body**

The 'Economic and Social ***Statistics*** of Sri Lanka - 2016' an annual publication of the Central Bank of Sri Lanka, is now available for public access.

The publication contains economic and social indicators of Sri Lanka in the areas of Gross Domestic Product (GDP), ***agriculture***, industry, external trade and finance, government finance, banking and financial institutions, money and capital markets, prices and wages, labour force, transportation, education, health, telecommunication services, population, climate and selected information on economic and social indicators of other countries. In addition, information on living conditions, poverty and household characteristics in Sri Lanka from Household Income and Expenditure ***Survey*** (HIES) conducted by the Department of ***Census*** and ***Statistics*** also available in the publication.

Further, it includes disaggregated information at the provincial level on key economic variables. The ***statistics*** in this publication has been presented in various breakdowns and in time series / cross sectional basis to serve the diverse needs of users. The ***data*** can be used for analysing recent trends in the economy, and will be useful to entrepreneurs, policy makers, researchers, teachers, students and the general public. This publication can be purchased in three languages (English, Sinhala and Tamil) from the Sales and Distribution Counters of the Central Bank at its Central Point Building (Chatham Street, Colombo 01), Centre for Banking Studies (No. 58, Sri Jayewardenepura Mawatha, Rajagiriya), Regional Offices of the Central Bank (Matara, Matale, Nuwara Eliya, Jaffna, Kilinochchi, ***Statistics*** Department Trincomalee and Anuradhapura) and from leading bookshops. Electronic version of this publication is also available at aforesaid outlets. In addition, this publication can also be downloaded from the Central Bank official website ([*http://www.cbsl.gov.lk*](http://www.cbsl.gov.lk)) in three languages.

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[***-Call for Abstracts Announced for 2016 URISA GIS and Health Symposium***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5J2H-B4S1-JD3Y-Y0N3-00000-00&context=1516831)

ENP Newswire

February 11, 2016 Thursday

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**Length:** 565 words

**Body**

The Urban and Regional Information Systems Association (URISA), in partnership with the American Public Health Association (APHA), invites abstract submissions for the 2016 GIS and Health Symposium.

The theme for this year's Symposium is 'Mapping the Way to Healthy Communities'. The event will take place June 1-3, 2016 in Washington, DC.

Abstract submissions are due on March 15, 2016.

The Symposium program will be developed, in large part, from abstracts submitted by the community through this Call. The Committee welcomes the submission of individual papers, complete sessions, and panel discussions on a variety of topics. We are specifically interested in abstracts related to the following topics.

Connecting health with spatial relationships (and ***data***) - thinking about health in a more spatial format

Tools for policy-makers, planners, researchers.

Role of GIS in communicating health information/issues

Health impact assessments

Metrics/measuring health outcomes through GIS

Creating synergy between the public health realm and urban and regional entities carrying out planning, research and policy.

Focused policy session - cross-sector session addressing the Surgeon General's National Prevention Strategy 'Health in All Policies' approach

Access to healthcare / health facilities and services

***Agriculture*** and food systems (access to healthy foods, food safety)

Active living, recreation, and physical activity from transportation; obesity strategies and interventions

Health equity (include income considerations, minority groups, aging, persons with disabilities, etc.)

Urban ecology/urban health - natural and human systems (social ecology; humans and environment)

Climate change/resiliency - effects on natural and human health/systems

Emergency preparedness and response

Health and hazards

Crime, violence, personal safety/health

Injuries, disabilities, risk

Built environment - land use, transportation, resource management systems, Complete Streets, infrastructure, 'Healthy Communities' (Applying GIS to Build a Healthy Community); also livability; active communities (transportation and recreation)

Epidemiology; disease vectors; spread of infectious diseases - emerging technologies and health issues (Ebola response, Zika virus/PAHO)

Exposures (air quality, water quality, lead, etc.)

Chronic diseases and the environment, including cancers, diabetes and obesity

Mobile field ***data*** collection mobile field ***data*** collection (examples: homeless point in time counts, food safety/restaurant inspections, facility inspections that includes things like hospitals, nursing homes, foster care sites, etc.)

Community mapping; crowd-sourcing health-related ***data***

***Data*** privacy, confidentiality

Other related topics

Individuals will be asked to further classify their proposal by indicating the applied methods and ***data*** sources for each submission:

Basic statistical or GIS-based analysis

Multivariate statistical models or mathematical models

Spatial modeling and cluster detection

Web-based delivering of ***data***

Mapping techniques

Geocoding

***Surveys***, vital ***statistics*** or ***census*** ***data***

Surveillance ***data***

Environmental spatial ***data***

Network analysis and site optimization

GPS, handheld/mobile device, and other ***data*** collection tools

Remote sensing

Other

For further details and the online abstract submission form, [*http://www.urisa.org/URISAHealth*](http://www.urisa.org/URISAHealth)

[Editorial queries for this story should be sent to [*newswire@enpublishing.co.uk*](mailto:newswire@enpublishing.co.uk) ]

**Load-Date:** February 11, 2016

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[***-Bank of Estonia-The anniversary of statistics in Estonia is to be celebrated with an international conference***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5JKN-3K61-JD3Y-Y35M-00000-00&context=1516831)

ENP Newswire

April 22, 2016 Friday

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**Length:** 404 words

**Body**

The anniversary of ***statistics*** in Estonia is to be celebrated with an international conference.

On Monday 25 April, experts on ***statistics*** from Estonia and neighbouring countries will speak at an international conference in the Estonia opera hall about the role of ***statistics*** in a modern information society, the expectations and needs of users of ***statistics*** today, potential developments for ***statistics***, and concerns about an ageing society.

The conference will be opened with video presentations by Stefan Schweinfest, Director of the ***Statistics*** Division at the United Nations, and Walter Radermacher, Director General of ***Eurostat***.

There will be presentations from the ***statistics*** offices of Estonia and Sweden and from the University of Tartu on the history of ***statistics*** in Europe and Estonia, the path from ***agricultural*** and population ***data*** to the first population ***census***, and the development of ***statistics*** in Estonia from independence to the turn of the century. The session will be chaired by Professor Kalev Parna of the Institute of Mathematics and ***Statistics*** of the University of Tartu.

Staff of Tallinn University, Nordregio and the OECD and a panel of Estonian experts will talk on international relations, the needs and expectations of users of ***statistics*** and the use of ***statistics*** in decision-making in a session chaired by Ardo Hansson, Governor of Eesti Pank.

The conference will end by looking to the future as experts from the Dutch statistical office, SEB and Tallinn and Tartu universities speak on exciting possible developments in ***statistics***, the problems of an ageing society, specific features of the countries round the Baltic Sea, and ***statistics*** as seen through the prism of politics. The session will be chaired by Andres Oopkaup, Director General of ***Statistics*** Estonia.

The conference is being organised by ***Statistics*** Estonia, Eesti Pank and the National Institute for Health Development on the 95th anniversary of the Estonian statistical system.

The conference programme and information about the speakers can be found on the website of ***Statistics*** Estonia.

The conference will also be broadcast live from 10.00 on Monday on the website of ***Statistics*** Estonia.

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**Load-Date:** April 22, 2016

**End of Document**



[***Preliminary results of the June Agricultural Census 2016***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5KJB-2Y51-F15K-23SM-00000-00&context=1516831)

Farming Life

August 25, 2016 Thursday

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**Length:** 485 words

**Body**

The preliminary results of the June 2016 ***Agricultural*** ***Census*** have been released by the Department of ***Agriculture***, Environment and Rural Affairs.

The ***statistics*** are compiled from a ***survey*** of farm businesses augmented by administrative ***data***. The preliminary results were based on the first 9,000 returns and, whilst they should give an indication of the main trends, are liable to be amended in the light of returns received and processed later. Final results will be published in November 2016 by which time all returns from farmers will have been processed.

The main changes between June 2015 and June 2016 are:

Cereals: The area of cereals grown increased by 2% to 33,600 ha with winter wheat, winter barley and oats all increasing in 2016. Spring barley fell by 3% but still remains the most popular cereal crop with 15,200 ha planted across Northern Ireland.

Other crops: The area in other field crops is 4% lower than last year, which is partly due to a reduction in the areas planted under arable crop silage and forage maize. The area of arable crop silage fell by 5% to 3,100 ha, whereas, the area of forage maize fell by 8% to 1,400ha. This fall in the forage maize area continues a downward trend that began in 2008 when 3,500 ha was grown. The area of potatoes increased by 4% to 3,700 ha, a slight recovery from 2015 which had the lowest area ever recorded for the crop.

Cattle: Total cattle numbers were 3% higher than in June 2015.The number of dairy cows increased by 2% to 317,100 head, which is an all time high. The number of beef cows increased by 4% to 269,700.

Sheep: There was a 1% rise in the number of breeding ewes compared with 2015. Numbers have fluctuated in recent years, falling to a 20 year low of 876,000 in 2010 before increasing to 950,100 this year, which is the highest level since 2007. Lamb numbers have increased by 2% which links in with the increase in ewe numbers. Overall, the total number of sheep recorded surpassed 2 million which again is a level not seen since 2007.

Pigs: In comparison with 2015, sow numbers increased by 2% to 39,100, whereas, the overall pig herd was 4% larger. Most pig categories are showing an upward trend but the growth in the number of fattening pigs has caused the most increase in total numbers.

Poultry: Laying birds recorded for the 1 June 2016 increased by 20% to 3.8 million birds while broiler poultry numbers increased by 4% at that date. The laying bird population has shown strong growth since 2013 and this is partly due to new producers who have entered the industry.

Farmers and workers: The size of the ***agricultural*** labour force decreased by 1% per cent from the previous year to 47,400. Within this, the number of farmers decreased by 2% to 29,500 due to decreases in both the full-time and part-time farmer categories. In terms of other full-time workers, both paid and unpaid categories showed a decrease of 5% compared to 2015.

**Load-Date:** August 25, 2016

**End of Document**



[***IMF report endorses Argentine governments' measurement of economic growth***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5J2R-GSK1-DYRV-34V5-00000-00&context=1516831)

BBC Monitoring Latin America - Political

Supplied by BBC Worldwide Monitoring

February 12, 2016 Friday

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**Length:** 1736 words

**Body**

Text of report by Argentine newspaper Pagina 12 website on 9 February

[Report by Javier Lewkowicz: "The IMF Says No More Excuses for ***Statistics*** Blackout"]

[Note: The translation below is machine based with limited editorial intervention.]

The blackout surrounding ***statistics*** that was decreed by the administration collides squarely with the recommendations made months ago by the IMF regarding most of the official ***data*** published by the Indec [National Institute of ***Statistics*** and ***Census***]. Pagina/ 12 gained access to a confidential document sent to the national authorities where the Fund carefully evaluated several official indicators, including the price index, the GDP, the indicator for the industrial sector, for construction, utilities, and of the financial system. The IMF staff highlighted the work on improving the indicator for the GDP despite the shortcomings noted, some of which were addressed by the Indec over the last year. They also compare each indicator of the level of sector activity with private estimates. This shows that the "statistical emergency" is an overreaction by the new authorities of the institute of ***statistics***. In the case of the CPI [Consumer Price Index], the Fund questions that the way to measure rents, utilities and the sample selection affects the permanent gap with private price estimates and criticizes other methodological issues.

"With the publication of the new GDP in May and December 2014, the Indec completed a six-year project aimed at improving the quality of Argentine national accounts," begins the IMF document issued on 2 April 2015. It bears the signature of Roberto Cardarelli, chief of the North American division of the Western Hemisphere department of the body, and it is directed at Sergio Chodos, then the country's representative to the IMF, and Bernardo Lischinsky, of the permanent staff in the international organization. The Fund notes that the improvement in the calculation of the GDP is explained by the inclusion of the latest ***data*** as a source for national accounts, change of base year (1993 to 2004), changes in concepts, definitions, and classifications, and improved statistical methods. "As a result, the methodology of the GDP has improved and converged with international standards," the IMF summarizes.

The request from the IMF [subhead]

This statement, however, is accompanied by a series of recommendations that the Indec applied, but did not publish during the previous government. The most important is the measurement of the financial sector. With the changes proposed by the Fund, the GDP would have grown between 0.1 and 0.3 percentage points less since 2004, except for 2009, which would have remained unchanged. The Indec measured the level of activity in the financial sector by deflating deposits and loans by an average of the consumer price index and the wholesale price index. Using this estimate, the weight of the financial sector in the economy increased considerably in recent years, from 3.1 per cent in 2010 to 5.3 per cent of GDP in 2014. In Argentina, the activity of banks also exceeded by far the average advance that the sector showed in Brazil, Chile, and Bolivia, as studied by the Fund. In addition, the financial sector grew in the opposite direction to the rest of the economy in 2014.

Due to the causes just described, the IMF found that the Indec should change the method of measurement of the financial sector. It asked that the deflator formed from a mix of retail and wholesale prices be replaced by one of a more general nature, such as the GDP deflator or the deflator of demand, technical concepts which can be summarized as follows: that the questioned CPI does not interfere in calculating financial activity. However, it was not about going to calculate a new price index but to clear variables through mathematical methods through the use of theoretical deflators.

Revised numbers [subhead]

The Indec did not take long to accept the change in the measurement methodology for the banking activity, which was completed by the end of last year, but never published. This newspaper had access to the values of GDP arising from the new methodology, calculated by the IMF itself. While there is a reduction in the growth in each year, they are not significant changes. In 2005, the GDP had grown 0.1 per cent less, as in 2006 and 2010. In 2007, growth was down 0.2 percentage points, as in 2008, 2011, and 2012. The biggest adjustment occurred in 2013, down 0.3 per cent, while in 2009 the GDP suffered no changes.

With this, the growth of Argentina's economy would have been revised from 9.2 to 9.1 per cent in 2005, from 8.4 to 8.3 in 2006, from 8 to 7.8 in 2007, and from 3.1 to 2.9 in 2008. It would have been unchanged at 0.1 in 2009, fallen from 9.5 to 9.4 in 2010, from 8.4 to 8.2 in 2011, from 0.8 to 0.6 in 2012, and from 2.9 to 2.6 per cent in 2013. The cumulative fall in GDP between 2004 and 2013 was 1.4 per cent. The numbers who bear this correction already include a downward revision due to change in the basis year for measuring GDP, from 1993 to 2004, endorsed by the Fund. This base change made the cumulative growth between 2006 and 2012 to be 8.5 percentage points below the figure calculated with the base year of 1993. The new GDP based on 2004 was published in May 2014.

Other minor questions [subhead]

The Fund noted other problems in measuring GDP, but without noticeable effect in the aggregate calculation. It warned that in the sector comprising restaurants, hotels, and other businesses such as hairdressers, the Indec does not perform a ***survey***. Instead, it uses the consumption ***data*** provided by the National ***Survey*** of Household Spending and then applies an indicator of price elasticity and income. This means that it calculates at the theoretical level the demand for restaurants, hotels, and hairdressers before changes in prices and income levels. The result is an indicator of demand that is not solid enough, says the IMF, and warns that between 2009 and 2012 the sector grew at a rate above the average of the economy. It proposes comparing the calculated ***data*** with direct observations, i.e. ***surveys*** on the premises.

The Fund also warned that in 2009 the automotive sector registered a decline of 15 per cent in production, according to Adefa [Association of Motor Vehicle Manufacturers], which brings together the automakers. However, the Indec recorded for the year a slight increase in vehicle purchases in the local market. From the ***statistics*** institute they responded that in that year exports fell 20 per cent, which had a strong impact on production, and there was some replacement in the local market of imported cars for the surplus of vehicles not exported to Brazil. As Argentina exports midsize cars and imports small vehicles, in terms of value it would have produced the phenomenon of a slight increase in purchases coupled with a sharp drop in production.

Comparison with private sector measurements [subhead]

"The comparison with other indicators of activity does not show a systematic deviation in GDP growth. Evidence shows that GDP ***data*** shows deviations up and down relative to the information provided by the chambers of commerce and business," says the Fund. The agency compared the information provided by the EMI (indicator of industrial activity by the Indec) with estimates from the FIEL [Latin-American Economic Research Foundation] and Orlando Ferreres. The Indec reported an increase in industrial activity for the period 2010 to 2012 higher than the private sector estimates, but the three agreed when measuring the industrial slowdown since.

The IMF also noted that "the Indec information on the metallurgical, cement, and steel sector is consistent with the quantity indicators of the corresponding sector chambers." It also noted that "the automobile sector in 2010-2011 grew much faster in the national accounts than the number of vehicles produced, but the difference is much smaller in 2012-2013." "Growth in the sector of electricity, gas, and water closely follows the generation of electricity for the domestic market," said the IMF, while it validated that "the pattern of growth in the construction sector shows a good historical relationship with the index published by Construya, a consultant firm in the construction sector." The official index of the construction sector was below the private rate between 2012 and 2014. Meanwhile, the Fund says that "the retail business activity closely follows the volume of goods sold for domestic use."

Furthermore, in its report of April 2015, the IMF detailed and gives its approval to the official measurement methods that result from the change of base year from 1993 to 2004. Regarding this point, it analyses the ***statistics*** in strictly methodological terms (without taking into account the results compared with consultants). In the area of ***agriculture***, livestock and fisheries, it says that "the information used is very detailed and exceeds the level of detail in many other countries." It details the changes made in the field of mining and oil and also in each of the manufacturing subsectors. In the construction sector it warns that the measurement through the consumption of materials and the number of employees "is not the best estimate, but it is an accepted method." In the retail sector, it proposes to update periodically the measurement from the side of household spending with the National ***Survey*** of Household Spending, which took place in 2012-2013 and whose next edition is planned for 2017-2018. Finally, the IMF points out that the sources of the ***statistics*** for the calculation of public consumption, investment in construction, in machinery and equipment, exports and imports, and the trade balance of services "are in line with international practices."

In short, the IMF warned of several problems in measuring the level of aggregate and sectoral activity, but also highlights progress and in no way invalidates all calculations by the Indec. In this context, the administration of Mauricio Macri is implementing a total statistical blackout, which will prevent for several months from having the slightest notion of what is happening in the national economy, in a context of strong acceleration of inflation, deterioration of real wages and, predictably, a fall in aggregate demand and the level of activity.

Source: Pagina 12 website, Buenos Aires, in Spanish 9 Feb 16

**Load-Date:** February 12, 2016

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[***Bosnian demographics expert comments on delays in census results publication***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5J9Y-P1W1-DYRV-34R5-00000-00&context=1516831)

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**Body**

Text of report by Bosnia-based Al-Jazeera Balkans TV on 14 March

[Interview with demographics expert Hasan Zolic by Snjezana Mulic-Softic; place and date not given: "B-H Will Not Have Only Millions To Regret Without ***Census***"]

The population ***census*** in Bosnia and Hercegovina [B-H], which was carried out in October 2013, has reached a critical point. If the document "Single Programme for Processing ***Data*** from the B-H 2013 ***Census*** of Population, Households, and Apartments" is not adopted this week (March 15), the statistical institutions in this country will not be able to finish their job by July 1, which is the final deadline for the announcement of results, and this means that the ***census*** will be proclaimed invalid.

Hasan Zolic, ***statistics*** and demographics professor and former director of the B-H ***Statistics*** Agency, is speaking for Al Jazeera about how it came to this - that the largest statistical project in B-H, which had been awaited for full 20 years, is brought to a dead end, and what will be the consequences of the ***census*** annulment.

[Mulic-Softic] Mr Zolic, could you briefly explain the reasons for delays in the processing of 2013 ***census*** ***data***?

[Zolic] The key reason is the fact that the colleagues from the entities' statistical institutions cannot agree on the criteria for defining which population needs to be excluded from the contingent of present population. The number of present population, according to preliminary results, was roughly 3,793,000.

The International Monitoring Operation (IMO), which was assigned to this task by ***Eurostat*** in Luxembourg, has tried to reach an agreement between the state Agency and the Serb Republic ***Statistics*** Bureau by proposing criteria in June 2015 and saying what is relevant for defining the non-resident part of the population.

In sum, this means that the status of resident population is determined solely on the basis of responses to the questions one to seven from the P1 form, and that the question 40, which is related to places of work and education outside B-H cannot be used for determining the number of permanent population. However, the Serb Republic wants to include the question 40 as relevant, as they believe that the responses to questions one to seven would not give the accurate picture.

I agree with IMO that the responses to question 40 are not relevant for extracting the non-resident population. However, the Serb Republic ***Statistics*** Bureau asked the Serb Republic Government in February 2015 to define this question as relevant. So, this entity's Government imposed this question as relevant for the whole of B-H, without consulting anyone on this. This is why there have been clashes and delays.

[Mulic-Softic] If the model advocated by the Serb Republic were to be applied, what would this entity get with this?

[Zolic] I do not know, but I am guessing that they want around 400,000-450,000 residents of B-H to be excluded from the contingent of 3,793,000. They want to exclude everyone who is getting education abroad, occasionally working abroad, and so on. However, this should not be done. People should not be erased if they have certain documents, which are recognized by the European and UN standards. They have proven their residence in B-H.

[Softic-Mulic] It is often said that the Serb Republic actually wants to reduce the number of Bosniaks in that entity. Is that true?

[Zolic] No one wants to say that, but since the Bosniak community is the largest, it could be concluded, following the law of large numbers, that this is the case. But, I say that this is not important, the total population is important. The IMO team said three times that there were no grounds for elimination and that should be it.

[Mulic-Softic] If IMO decided what was relevant and what not, why have the state and entity agencies been meeting all this time, delaying the process, and bringing into question the whole ***census***?

[Zolic] The state ***Statistics*** Agency is probably trying to reach a consensus with the entities' agencies. This is hardly possible, as we could see from the meeting on Wednesday [March 9], but perhaps there will be more sense on Monday [March 15], when this meeting is scheduled to continue.

[Mulic-Softic] It has been reported continuously that the key documents, such as the "Single Programme for Processing ***Data*** from the B-H 2013 ***Census*** of Population, Households, and Apartments" and "Revised ***Census*** ***Data*** Processing Work Plan" cannot be adopted. Why had they not adopted these documents before the ***census***?

[Zolic] That was a big mistake. They should have set the criteria when the ***data*** collection started, but they failed to do this. The Agency management failed in this matter. I know that they will resent this, but this is a fact.

It is important to say that they had agreed on the test ***census*** and everything went smoothly, but this changed later. Why is this the case? You should ask Zdenko Milinovic, who managed the B-H ***Statistics*** Agency at the time. He left, and he left the state of affairs as it is now. It is a also a fact that something that should have been dealt with by the statistical profession has moved to the political arena, so the Government of one entity took the liberty of deciding which criteria are relevant, and which are not.

[Mulic-Softic] Taking into account the B-H ***Statistics*** Agency's technology, how much time is needed for the ***data*** analysis?

[Zolic] The Agency's technology now, in relation to the technology used in 1991, when we had the last ***census***, is really modern. Objectively speaking, it should not take more than several months after the poll for the results to be announced. The ***census*** was completed in September 2013, and they had the first results in November. Had they continued this way, they could have started announcing the results already at the end of that year.

[Mulic-Softic] You headed the ***Statistics*** Agency in B-H in 1991, when the previous ***census*** took place. How much time did you need for ***data*** processing and publication?

[Zolic] We did that in several months' time. The problem then was that this was just before the beginning of the war, and there was commotion already at that time. We had power cuts, we could not turn on the devices, and we could not continuously announce results as they were coming. We were using the optical readers and we processed the ***data*** from 109 municipalities in B-H at the time in only several months' time.

[Mulic-Softic] In comparison with countries of similar size in Europe, how much time would they need for summing up the ***census*** results?

[Zolic] It depends on the ***census*** structure, and what we want to get from ***census***. In Europe, in western countries, there are population registers. For example, Denmark and Norway have population registers and they know the population numbers at any time, as well as where people live and work, and so on. When they have ***censuses***, they do not ask many questions. They are only checking the ***data*** and asking additional questions based on their current interests. Our situation is more complex, as we want to get different information from the ***census***. We do not know how many families are leaving B-H, we have no register, and we do not know anything. We find out by chance that 30 families left Livno, and so on.

[Mulic-Softic] This means that the CIPS [Citizens' Identity Protection System] ***data***, which should be the single register of citizens, which was paid for with tens of millions of euros, is not helpful either?

[Zolic] No, absolutely not. I have a feeling that CIPS is not updated at all. I have been telling them this, but they only resented it. CIPS says that B-H has the population of 3,900,000. It does not include people who died, moved, and so on. I think that people who work there do not know the situation very well.

[Mulic-Softic] Have the delays been caused by a lack of competent staff, among other things?

[Zolic] I am not sure that the Agency management at the time of the ***census*** was competent either, and that it was up to this big task of population ***census***, that it had a grasp of the statistical principles, and so on. ***Census*** is not a political, but statistical matter. There is no debate about this, and one has to know what is what. Many people who worked on that project were only beginners. There was no training, no agreement on the methodology. Then the issue of question 40 surfaced and politics started to interfere.

I heard one journalist report that Dodik said that the Bosniaks wanted to fix the numbers so that they would be 50 per cent. People cannot be erased, and I am again coming back to the total population. Everything has come down to how many Bosniaks, Serbs, Croats, and others there are. That is, essentially, the least important, because we still do not have the economic and other indicators, which are the most important for every ***census***.

[Mulic-Softic] How deeply has politics interfered in this matter?

[Zolic] Nowhere has politics interfered in ***statistics*** as much as here. As soon as the entity agencies involved the Government and asked the Serb Republic Government to decide, the politics interfered. The profession said that question 40 was not necessary, and this was confirmed by the IMO team. This was not the Croat, Bosniak, or the Serb position, but the position of an international team. This situation is favourable for someone, I do not know who, but the ***census*** could be proclaimed invalid because the ***data*** will become unusable on July 1.

[Mulic-Softic] How was this final deadline set?

[Zolic] There are certain statistical norms, the duration of a demographic cycle, when it turns, and so on. The validity of ***data*** changes by time. What is valid today is no longer valid after some time. This is obvious. Those who were students at the time of the ***census*** are no longer students; someone was going to school at the time of the ***census***, and now they are in college, and so on.

[Mulic-Softic] If the ***census*** is annulled, what will be the consequences for B-H, apart from the 50 million marks spent?

[Zolic] If it were only the millions spent! The issue is what ***data*** are we going to give to the EU. This is not only the matter of the population numbers, or ethnic composition, that is the least important. We have to have ***data*** about ***agriculture***, cultivated and non-cultivated land, forests, apartments, quality, size, infrastructure, health care, doctors, specialists, educational structure, the number of children, schools, teachers, students, and so on. These are the most important ***data***. Without this, we cannot progress on the path towards the EU.

[Mulic-Softic] Has B-H spent only 50 million, or even more, considering that the ***data*** processing has been delayed for two and a half years?

[Zolic] Absolutely. I do not know how much the country spent, but I know that they have been paying rent for storage of the ***census*** material in East Sarajevo. I do not know how much this costs, but I know that it is not cheap. There is another problem. This material has to be kept in the state institutions in line with the Law on ***Statistics*** for 15, and in some cases 20 years. This is how it is done in the world. According to our legislation, the ***census*** material can be in one entity, but when it is processed, it has to be placed in a single safe spot. If we allowed just anyone to manage this, who knows what could happen. These are individual ***data*** that cannot be revealed.

There are different situations. For example, in a mixed marriage, someone does not want their spouse to know what they said under ethnicity. If this ***data*** were revealed, their marriage could suffer. There are people who do not want their children or spouse to know what they put down under real estate, property, and so on. People are people, while it seems that this ***data*** could easily be abused.

[Mulic-Softic] Will anyone be held to account for the delays in ***data*** processing and results publication, as well as for the extra spending?

[Zolic] No, I do not think so. You see that no one here is held accountable for anything. Who will be held to account? Who?!

Source: Al Jazeera Balkans TV, Sarajevo, in Bosnian 0000 gmt 14 Mar 16

**Load-Date:** March 17, 2016

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[***House of Cards—An analysis of Macao's resident support for tourism and casino development***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:6BM4-FYP1-JBMY-H0HK-00000-00&context=1516831)

Tourism and Hospitality Research

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**ABSTRACT**

Tourism contribution to Macao's gross domestic product in 2013 was 86% positioning it as a global leader in terms of reliance on tourism revenues, to which casinos contribute over 90%. Most Macao residents are linked to tourism's economic success yet this study shows the rapid development has created negative sentiment toward the industry and specifically casinos. While acknowledging economic benefits, this study showed residents were concerned more about traffic congestion, overcrowding, and living costs with a greater wish for improved public transportation and leisure offerings and less casino development emphasis. A tourism development strategy firmly focused on tourism diversification issues was urgently suggested.

**FULL TEXT**

**Introduction**

It is well established in tourism research that the perceived benefits and costs by residents toward travel and tourism will determine their support for particular tourism development projects (Sirakaya et al., 2002). The perceived negative impacts will also have greater significance and influence on resident support for tourism (Schofield, 2011). These generally evolve around the decline of the physical environment such as land deprivation, increased pollution, and threats to natural resources and endangered species. Impacts can also be psychological with stress caused when in contact with tourists and increased tension toward tourist activities and annoyance caused by congestion and crowding.

Macao is ranked number one globally in terms of tourism's direct contribution to employment at 47.1% and to total capital investment in the destination (42.4%) (World Travel and Tourism Congress (WTTC), 2014). The city is also placed second by the WTTC as a destination relying on the tourism industry for government revenues. The issue therefore of Macao resident support toward ongoing tourism development takes on greater relevance and significance. The total contribution of travel and tourism to Macao's gross domestic product (GDP) in 2013 was estimated at USD43.2 billion, being 86% of total GDP. Not accounting for the multiplier effect of those servicing the casino industry, direct gaming taxes to the Macao Government totaled also USD18 billion in 2013 (Macau Gaming Inspection and Coordination Bureau, 2014). This increasing reliance on one industry to grow Macao's economy is concerning given that any negative impact to the casino industry could have greater ramifications for the economic and social stability of Macao. Only 1.5% of Macao's tourism revenues in 2013 were generated from domestic travel (World Travel and Tourism Congress, 2014). With 29.3 million visitors to Macao in 2013 and a resident population of 607,500 representing a visitor-to-resident ratio of 48:1 compared to a ratio of 17:1 (7.4 million visitors and 437,455 residents) in 1999 (Macau ***Statistics*** and ***Census*** Service, 2015a) the year of Macao's Handover to China, this rapid expansion in tourism and gaming has brought both positive and negative impacts to the community.

While Macao's economic prosperity through tourism is significant be it through employment creation or international investment, the issue that Macao's tourism development is unsustainable on its present trajectory has been reflected in a growing number of conflicts between local residents, tourists, and the tourism products and services established around this (Wan and Li, 2013). Dissatisfaction of citizens and grievances of displaced local workers have also been increasingly played out in the public domain due to the rise in property prices and costs of daily necessities, as well as the large importation of migrant workers perceived to take away employment opportunities of local workers. There is growing sentiment that the grievances and discontent of local residents could mount up and potentially jeopardize social stability (Zheng and Hung, 2012). Therefore, this research investigates and measures Macao residents' attitudes toward tourism and their acceptability with different development options. This research and findings are of importance given Macao's significant reliance on its tourism economy where the continued support of the community toward tourism will be a critical feature in the city's future success.

**Literature review**

Studies have shown that resident attitudes toward tourism development are dynamic and may change over time due to their perceived impacts. Nunkoo et al. (2013) concluded in their longitudinal examination of several resident impact studies conducted between 1984 and 2010 that it was of utmost important to understand resident attitudes toward tourism and take their wants and desires into consideration when developing tourism in a destination. Deery et al. (2012) consolidated a number of key social impact variables toward tourism from the literature mostly underpinned by social exchange theory and the argument that tourism development influences qualify of life. Examining resident attitudes in a community dealing with a transition from fisheries to tourism, Huh and Vogt's (2008) longitudinal study showed attitudes toward economic impacts changed over time depending on perceived financial rewards and benefits from tourism. Age was found to be the most dominant variable with young adults being more favorable to the new economic environment. Reviewing Asian tourism impact literature from the early 1990s, the economic gains from tourism were generally acknowledged by resident respondents in Hong Kong (Mok et al., 1991) and in Singapore (Khan et al., 1990) with both research outcomes showing that while negative impacts were cited by residents such as traffic congestion, crime, and a decline in morality, tourism brought more revenue, positive tourism destination image impressions, and infrastructure development benefits. In more recent Asian tourism impact studies, it was found that in the Thailand island of Phuket while acknowledging the downside of rising land prices, inflation, cost of living, and overcrowding and congestion challenges, the generally consensus and support for tourism by residents was positive with higher incomes and benefits through domestic and foreign investments along with an improvement in infrastructure and public facilities (Marzuki, 2012). A similar sentiment was not shared though by residents on the tourism island of Boracay in the Philippines. Economic benefits were recognized but there was greater concern on the slow erosion of white beaches and water pollution as well as cultural problems exacerbated between a growing number of tourists, migrant labor, and permanent population (Ong et al., 2011). A common thread in the impact research was that although tourism maybe viewed positive or negative, it was the tourism products and services installed or developed that had the ability to sway resident opinion. An imbalance can occur where tourism and the amount of visitors to the destination begin to overshadow the community setting (Andereck et al., 2005).

Andereck and Vogt (2000) found that regardless of the potential for tourism to result in negative impacts, residents could still support the development due to the products and services that were developed or enhanced in tandem to this. The research by Andereck and Vogt showed that outdoor recreation facilities, museums, historical attractions, restaurants, transportation, and retail offerings were more acceptable development options. Services such as tours operations and camping sites were less acceptable. Gaming establishments, bars, and clubs were found to be unacceptable products for greater tourism development focus. This research on Macao also took this approach on examining resident attitudes toward tourism in general and the influence of particular tourism products and services. The research also considered whether the Macao resident was working or not within tourism as there is reasonable agreement in the literature that the social impact variables should also be examined with those variables that influence resident perceptions such as their economic dependency on tourism (Deery et al., 2012). Several tourism impacts studies support the position that those personally benefiting from tourism through employment or business ventures would generate more positive perceptions toward tourism (Látkova and Vogt, 2012). Personal benefits could also involve noneconomic considerations such as community enrichment, neighborhood conditions, improved facilities, and increasing choices such as events and programs for residents (Nunkoo and Ramkissoon, 2011; Wang and Pfister, 2008). Diedrich and García-Buades (2009) linked local perceptions as possible indicators of destination decline. Examining five coastal villages in Belize at difference stages of development, their study found that resident opposition was a leading indicator of decline found at the development stage of tourism and not necessary before the critical and possible stagnation stage as suggested in Butler's (1980) tourism area life cycle. In line with the conclusion by Diedrich and García-Buades (2009) on Belize's tourism, given the dramatic increase in the Macao visitor-to-resident ratio from 17:1 in 1999 to 48:1 in 2013, this indicates greater need to assess Macao resident perceptions as possible early warning signs of possible destination decline before rather than after reaching critical levels of capacity.

Previous research on Macao's tourism development found that resident impact perceptions were dynamic with the ability to move along the negative and positive impact spectrum (Vong and McCartney, 2005; Wan, 2012). It was found using the social exchange theory that those who were enjoying personal benefits from tourism and particular the casino development had more positive perceptions and greater tolerance for various impacts of gaming development. Social exchange theory purports that a resident will use self-interest to seek out the highest net benefit from tourism. It is also a position that can evolve over time along the various stages of tourism development being influenced by resident tourism involvement and how the residents' own values condition personal attitudes (Wang and Pfister, 2008). Through this rapid tourism expansion period in Macao, residents have been increasingly aware of the increases in cost of living, general inflation, and the deterioration of the local environment with resident attitudes toward casino development, at the core of Macao's tourism success, becoming increasingly conservative in their view toward tourism (Vong, 2009). There is greater need therefore to understand not only Macao resident support toward tourism development but also those products and services that have greater ability to influence community individuals and groups perceptions. The strategy for increased community support would be to ensure positive impressions are augmented while those products deemed to produce negative impressions are limited. As suggested in the literature, it is important that support is harnessed across the various demographic profiles in the community including if they work or not for the tourism industry. The development options that were chosen in this research were determined both on their economic and noneconomic importance. These included the economic significance of casinos to the coffers of the Macao Government, Macao's geographical setting (gardens, pedestrian walkways, cycling tracks), the diversification of Macau's tourism economy (meetings, incentives, conventions, exhibitions (MICE), historical attractions, and hotels), entertainment experiences to both residents and tourists (performances, amusement parks, cinemas, retail stores, festivals, and fairs), and importance to residents' daily life (dining, hospitals, public transportation, and car parks). Several of these development options were within the integrated resort complex such as casinos, cinemas, retail stores, hotels, dining, car parks, festivals and fairs, MICE, and performances. With some overlap, other options such as gardens and hospitals existed outside these entertainment complexes.

**Macao's emergence as a casino city**

Macao's tourism development has been primarily due to the growth of casino gambling. In 2002, Macao had 11 casinos run by only one casino company with a total of 339 gaming tables yet by 2013 six casino companies ran 35 casinos and 5750 casino tables (Table 1). In just over a decade, the number of casinos in the city had tripled while the number of gaming tables had increased 17 times (1600%). Macao's rapid global leadership in gaming in terms of gross gaming revenues took just a decade after casino liberalization when the enclave surpassed all the gross gaming revenues for commercial casinos in America, including that of the State of Nevada. In 2013, Macao generated USD45.1 billion in gross gaming revenues, 96% of which was generated from table games (Macau ***Statistics*** and ***Census*** Service, 2014a) while America's commercial casinos in total generated USD37.34 billion (American Gaming Association, 2013). The Macao Government receives 40% casino taxation (Gu et al., 2012) elevating the city to fifth globally in terms of GDP per capita. Therefore as a casino community, Macao residents must grapple with the negatives impacts often construed with casinos in close proximity to resident populations. Examining the social cost of local problem gambling to Macao's public sector, Fong, Fong, and Li (2011) reported that in general, social costs related to gambling in Macao (such as treatment and prevention costs, promotional efforts, training, regulatory, and legal costs) were USD106.31 million, an increase of 163% since 2003 which had recorded social costs of USD40.45 million. This figure is also underreported as this did not take into consideration the low awareness of treatment services in Macao, and that Chinese gamblers are generally reluctant to discuss and report gambling problems. In 2013, out of an employed labor force of 370,400, 87,600 were employed in Macao's gaming industry (Macau ***Statistics*** and ***Census*** Service, 2014b). This included 25,250 casino dealers who by law must only be Macao residents (Macau ***Statistics*** and ***Census*** Service, 2014c). As well as living in close proximity to casinos many in the community will be in constant contact through employment. Table 1.Number of casinos and table games in Macao (2002–2013).

| **Year** | **Total Number of gaming tables** | **Casino companies** | **Total Number of casinos** |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S.J.M** | **Galaxy Casino** | **Venetian Macau** | **Wynn Resorts Macau** | **Melco Crown Macau** | **MGM Macau** |  |  |  |
| 2002 | 339 | 11 | – | – | – | – | – | 11 |
| 2003 | 424 | 11 | – | – | – | – | – | 11 |
| 2004 | 1092 | 13 | 1 | 1 | – | – | – | 15 |
| 2005 | 1388 | 15 | 1 | 1 | – | – | – | 17 |
| 2006 | 2792 | 17 | 5 | 1 | 1 | – | – | 24 |
| 2007 | 4375 | 18 | 5 | 2 | 1 | 1 | 1 | 28 |
| 2008 | 4017 | 19 | 5 | 3 | 1 | 2 | 1 | 31 |
| 2009 | 4770 | 20 | 5 | 3 | 1 | 3 | 1 | 33 |
| 2010 | 4791 | 20 | 5 | 3 | 1 | 3 | 1 | 33 |
| 2011 | 5302 | 20 | 6 | 3 | 1 | 3 | 1 | 34 |
| 2012 | 5485 | 20 | 6 | 4 | 1 | 3 | 1 | 35 |
| 2013 | 5750 | 20 | 6 | 4 | 1 | 3 | 1 | 35 |

Source: Macau Gaming Inspection and Coordination Bureau (2014).

Government actions toward Macao's problem gambling concerns have emerged later in the casino tourism development cycle. In 2013, it was reported that nearly 3% or 13,000 Macao residents had a gambling problem (Ho, 2013). In 2012 the Macao Government introduced new legislation to close slot machines parlors in residential areas. Five of Macao's 11 slot-machine parlors that operated independently of casinos had to close or move (Macau Business, 2015). Also in 2012, the Macao Government raised the casino entry and working age limit from 18 to 21 years old (Macau Government, 2012). These measures were implemented in the hope to alleviate growing negative perceptions from the community toward Macao's tourism trajectory which was essentially casino based.

As a casino city, Macao relies essentially on two visitor markets—Mainland China and Hong Kong. As can be seen from Table 2, together these two markets made up nearly 90% of total visitation in 2013. A close neighbor geographically to Macao, Hong Kong visitation has been historically constant dating from before the Macao Handover. However, this contest for limited resources in their allocation and use is an increasing source of friction and conflict between local residents and visitors (Wan and Li, 2013) who are essentially from China. The influx of tourists has caused vehicle and crowd congestion around Macao raising increasing concerns about Macao's physical and social carrying capacities and the ability to keep absorbing these large numbers of visitors. Most of these visitors are also day-trippers with most visitors not staying overnight in a Macao hotel (Table 2). In 2002, 24% of Macao visitors stayed in a hotel rising to 36% in 2013. The casino industry dominance and large casino revenues have created limited incentive to deviate from the present casino tourism model. The perception of Macao is still one entrenched as a gaming destination and where visitor spending is primarily on gambling (McCartney, 2014). There has been limited tourism diversification into other important economic drivers beyond casinos. Table 2.Number of visitor arrivals to Macao and hotel guests (‘000) (2002–2013).

| **Year** | **Total number of visitors** | **Total overnight hotel guests** | **Hotel rooms/beds** | **Occupancy** | **Visitors from Mainland China** | **Visitors from Hong Kong** |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Number of Visitors** | **Percentage of total** | **Number of Visitors** | **Percentage of total** |  |  |  |  |  |
| 2002 | 11530.8 | 2766.9 | 8954/18628 | 62 | 4240.4 | 37 | 5101.4 | 44 |
| 2003 | 11887.9 | 3043.5 | 9185/19117 | 64 | 5742.0 | 48 | 4623.2 | 39 |
| 2004 | 16672.6 | 3956.2 | 9168/18591 | 76 | 9529.7 | 57 | 5051.1 | 30 |
| 2005 | 18711.2 | 4121.1 | 10,832/21460 | 71 | 10463.0 | 56 | 5614.9 | 30 |
| 2006 | 21988.1 | 4680.9 | 12,978/26851 | 72 | 11985.6 | 55 | 6940.7 | 32 |
| 2007 | 26993.0 | 5739.7 | 16,148/36467 | 77 | 14866.4 | 55 | 8174.1 | 30 |
| 2008 | 22933.2 | 6537.7 | 17,490/48890 | 74 | 11613.2 | 51 | 7016.5 | 31 |
| 2009 | 21752.8 | 6714.4 | 19,259/45487 | 71 | 10989.5 | 51 | 6727.8 | 31 |
| 2010 | 24965.4 | 7755.2 | 20,091/48386 | 80 | 13229.1 | 53 | 7466.1 | 30 |
| 2011 | 28002.3 | 8612.1 | 22,356/54666 | 84 | 16162.7 | 58 | 7582.9 | 27 |
| 2012 | 28082.3 | 9541.4 | 25,436/65324 | 84 | 16902.5 | 60 | 7081.2 | 25 |
| 2013 | 29324.8 | 10670.6 | 27,128/70969 | 83 | 18632.2 | 64 | 6766.0 | 23 |

Source: Macau ***Statistics*** and ***Census*** Service (2014d).

A Macao quality of life (QOL) study in 2012 found that 64% of Macao residents were mostly satisfied with the economic situation but were less satisfied with the state of the living environment that was being created (Macau Daily Times, 2012). A major concern for Macao as a jurisdiction almost entirely dependent on tourism is that any negative sentiment or backlash by residents toward visitors particularly from Mainland China could have a major impact on Macao's economy. As such Macao's National Tourism Office, the Macau Government Tourist Office, relaunched the tourism awareness campaign in 2013 aimed at educating locals about tourism and cultivating a warm and welcoming tourism environment for visitors (Macau Government Tourist Office, 2013). As evident in social exchange theory, a key goal of this Macao Government campaign is to convince the Macao community of the importance and benefits of tourism to them.

The Macao Government's response to negative sentiment by residents has been reactionary and recent. There are concerns that these impacts will only be amplified further if adequate and timely actions are not put in place by the government given the predicted expansion plan on the Cotai Strip with multiple additional casinos and integrated projects opening in the future (McCartney, 2013). There is also concern that the gaming industry is negatively impacting family life and the psychological well-being of individuals and family relationships in Macao with early exposure to gambling activities and employment as well as activities such as prostitution and illegal drugs consumption (Van Schalkwyk et al., 2006).

While this research sets out to investigate and measure Macao residents' attitudes toward tourism and their acceptability with different development options, the implications are on whether current government tourism direction and intervention are acceptable to Macao residents in creating a future for the city in which the community is more rather than less supportive. As suggested in the literature, this research examined several noneconomic considerations that could enrich community life such as parks, cycling paths, and events and entertainment. The emerging integrated resorts can provide several nongaming facilities such as performances, festivals, retail, and restaurants. However, a decade of attractive casino growth and revenues has meant limited attention on these based on instilling community support. Given recent community disquiet on the living environment that is being created in Macao, the issue will be on how to address growing community concerns and in creating a diversified tourism economy in the future that continues to receive community support. Importantly, this research not only examined resident attitudes toward Macao's tourism industry but those products if developed could help maintain positive sentiment in the community toward Macao's future tourism growth.

**Methodology**

In order to gauge community attitudes toward tourism, the use of a questionnaire is supported in the literature (Andereck and Vogt, 2000) and on previous resident impact studies in Macao (Vong, 2004; Vong and McCartney, 2005). In their examination of personal benefits sought from tourism development in a small community setting, Wang and Pfister (2008) randomly mailed a questionnaire ***survey*** to a sample of households on a billing list provided by a local utility company. Andereck et al. (2007) also used a mail ***survey*** sent to a random selection from a voter list, after telephoning first to ensure that the recipient fitted the ethnic profile. A questionnaire ***survey*** was also designed for the Macao research and conducted online and through face-to-face discussion. In the research, three key hypotheses were examined: H1. That Macao residents were generally supportive of Macao's tourism industryH2. That Macao residents who worked in tourism compared to those who did not, have different attitudes towards tourismH3. That Macao residents who worked in tourism compared to those who did not, have different ratings of acceptability towards various tourism product development options. A positivist approach was taken to the research as resident attitude toward tourism literature has clearly demonstrated the possibility that residents with some level of attachment to the industry such as employment may have differences in attitudes (Deery et al., 2012). In the Macao research, the question on employment was based on whether the resident respondent felt they worked or had worked in tourism, or were not working in tourism.

By comparing the responses to these three hypotheses, a better understanding of the tourism products that certain resident groups would favor and be more supportive of could be found. Based on the literature (Andereck and Vogt, 2000; Wang and Pfister, 2008), the questionnaire was designed around the following framework: With a focus on the attitudes of Macau residents toward tourism and various tourism options, the questionnaire had initial screening questions to ensure the respondent was a Macao resident and over the age of 20 years. The legal age to enter or work in a Macao casino is 21 years old (Macau Government, 2012). As some of the resident respondents could be near to this legal threshold, 20 years old was chosen rather than a younger age range.A five-point Likert type scaling (with 1 strongly disagree to 5 strongly agree) was used to measure residents' attitudes toward tourism. The list of attitude items was based on the literature (Andereck and Vogt, 2000; Vong, 2002; Vong and McCartney, 2005) with questions such as “the overall benefits of tourism outweigh the negative impacts,” “in recent years, my neighbourhood has become overcrowded because of tourists,” and “tourism promotes cultural exchange and education.”Residents' acceptability of specific tourism development options within the city and the casino resorts was rated on a five-point Likert type scaling (with 1 not acceptable and 5 very acceptable). Upon review several development options were chosen: specifically on their economic significance to Macao Government coffers being the casinos, accommodation, retail, and convention and exhibition facilities; Macao's geographical, historical, and environmental background with products such as gardens, pedestrian walkways, and cycling tracks; entertainment experiences to both residents and tourists which included performances, amusement parks, cinemas, festivals, and fairs; and importance to resident's daily life such as dining, public transportation, hospitals, and car parks. Among these development options, casinos, cinemas, retail stores, hotels, dining, car parks, performances, festivals, conventions and exhibitions, performances, and concerts were housed within the casino “integrated resort” complex while others were outside within Macao. The development options also considered comments in the local media by community groups on what services and products were lacking in Macao and resulting in growing perceptions of a declining QOL (McCartney, 2013).

After designing the questionnaire in English, the questions were translated into Chinese. The questionnaire was again translated back to English to ensure that question meaning was unchanged. With over 90% of Macao residents being ethnic Chinese and the reminder a mix of nationalities such as Portuguese and Filipino (Macau Government Tourism Office, 2015a, 2015b), the Internet questionnaires were written and distributed in both traditional Chinese and English. A pilot test conducted with 30 random resident respondents resulted in a few amendments. Development options were clearly defined if within or outside the integrated resorts as where future development options might be developed could influence level of acceptability.

With the online rate for Macao residents at 70% (Macao Internet Project and E-Research Lab, 2011) questioning was completed mostly via the Internet. Internet ***survey*** collection has been supported in the literature as it receives feedback quicker and cuts down on error by providing only one response to single-choice questions. It also permits the respondents to have more time to complete the ***survey*** and express their attitudes freely (Gingery, 2011) with no difference found in the contamination of ***data*** between online and face-to-face ***survey*** styles (Dolnicar et al., 2009). The ***data*** were collected through a snowball effect by sending the ***survey*** link to Macao residents biweekly via multiple Internet communication tools, including Whatsapp, Line, WeChat, and Facebook Messenger during the period from November 2013 to February 2014. The ***survey*** link was first sent to potential respondents from one of the researcher's local social networks with a request to forward the ***survey*** link to others for their participation. In addition, the ***survey*** link was shared on a dedicated Facebook page in order to extend the reach of the ***survey***. By gathering responses via links to additional friends and networks, the snowball sample was created. The resident respondents were requested to complete the questionnaire online and submit to the researcher upon completion. The purpose of the research was stated at the beginning of the online ***survey*** and respondents were encouraged to contact the researcher for any questions or concerns. Questions about demographic information and respondents' acceptability toward tourism and tourism development options were included in the ***survey***, and respondents were asked to provide the answer to each of these questions. The ***survey*** instrument was set up in a way that all the questions had to be answered before being able to proceed to the next section and making the final submission at the end of the ***survey***. With many in Macao over 55 years old not using the Internet (Macao Internet Project and E-Research Lab, 2011), to ensure a representation of resident participation, face-to-face questioning was also conducted with this age group during the period November 2013–February 2014. The face-to-face questioning was first conducted with the target respondents from one of the researcher's personal network who were over 55 years old and not using the Internet. The respondents were asked to refer other potential interviewees. Before the interview started, a screening question asking whether they used the Internet or not to determine if the resident respondent should be interviewed face to face. The researcher then explained the research purpose to the respondents telling each that their identity would be kept confidential. To allow the respondents to disclose their attitudes and feelings comfortably, the face-to-face questioning took place in either the respondents' homes or in a local coffee shop. The same questions were asked of all interviewees. Conducting the ***survey*** both online and face to face ensured that the questionnaires were distributed more widespread among Macao residents and a valid sample could be obtained.

**Results**

A total of 351 valid resident responses were recorded. The majority of the respondents were female representing 57.8% of the respondent sample (see Table 3). The sample gender mix was fairly representative of Macao's resident population with 51.4% being female in 2013 (Macau ***Statistics*** and ***Census*** Service, 2014d). Table 3.Demographics of Macao resident respondents (n=351).

| **Respondents** | **Number (percentage)** |
| --- | --- |
| Gender |  |
| Male | 148 (42.2) |
| Female | 203 (57.8) |
| Age |  |
| 20–29 | 171 (48.7) |
| 30–39 | 78 (22.2) |
| 40–49 | 44 (12.5) |
| ≥50 | 58 (16.6) |
| Birthplace |  |
| Macau | 335 (95.4) |
| Others | 16 (4.6) |
| Education level |  |
| Primary school | 32 (9.1) |
| High school | 70 (19.9) |
| College | 217 (61.8) |
| Postgraduate | 30 (8.5) |
| Others | 2 (0.6) |
| Currently employed |  |
| Yes | 294 (83.3) |
| No | 57 (16.2) |
| Working in tourism industry |  |
| Yes | 162 (46.2) |
| No | 189 (53.8) |

Many of the respondents were aged 20–29 years with most born in Macao (95.4%) and employed (83.8%). Macao's local employment rate in 2013 was high at 72.7 and 1.8% unemployment (Macau ***Statistics*** and ***Census*** Service, 2014d). Of the total respondents, there was a balance between those who had or are currently working in tourism compared to those who had not. From an employed labor population of 370,400 (which includes migrant labor), the principal employer was the gaming industry with 86,600 staff. The other four major sectors were the hotel sector with 27,900 employees, restaurants with 28,000 employees, retail with 34,200 employees, and the construction sector with 40,500 staff (Macau ***Statistics*** and ***Census*** Service, 2014b). Given Macao's tourism economy a significant portion of Macao's retail, restaurant, and construction will rely on tourism. The research did not seek to question the respondent further on their work role and whether in fact their job was linked to tourism while they may have perceived it differently.

A reliability test on the collected ***data*** was high with Cronbach's Alpha at 0.912. Using the scaling of 1 (strongly disagree) to 5 (strongly agree) residents were able to provide their perceptions of Macao's tourism development to date (Table 4). A fairly neutral response was recorded with a few statements such as “Because of tourism, communities develop more parks and recreational areas that local residents can use” (2.45), “I am happy and proud to see tourists coming to my community” (3.09), and “the quality of public service and life in my community has improved due to tourism development” (3.13). There was greater agreement on the occurrence of negative impacts that “tourism development increases the traffic problems of my neighborhood area” (4.60), “in recent years, my neighbourhood has become overcrowded because of tourists” (4.49), and “tourism results in an increase in the cost of living” (4.22). However, some positive impressions did rank high such as “tourism provides important tax revenues which benefit my neighbourhood” (4.16) and “the tourism industry can help my community grow and provide many job opportunities for residents” (4.03). While the Macao resident respondents acknowledged the economic benefits through tourism tax revenues and job creation, there is greater negative sentiment created by traffic congestion, overcrowding, and inflation. Hypothesis 1 is rejected in that there are in general a greater perception of negative community attitudes from the respondents toward Macao's tourism development both financially (cost of living) and mostly noneconomic factors (traffic congestion, overcrowding, increase in crime, and an increase in friction between locals and visitors). There was also a call from the community for the Macao Government to do more to promote tourism within the community and plan and manage tourism better. This has significant implications given the growing reliance on this single industry for Macao and the quality of the social exchange between resident and visitor. Some positive responses are recorded such as the vital role that tourism plays in the community and in preserving cultural identity. However, these do not reach as strong an agreement as several negative attitudes. Table 4.Macao resident attitudes toward tourism development.

| **Impact variables** | **Mean** | **Standard deviation** |
| --- | --- | --- |
| Tourism development increases the traffic problems of my neighborhood area | 4.60 | 0.620 |
| In recent years, my neighborhood has become overcrowded because of tourists | 4.49 | 0.732 |
| Tourism results in an increase in the cost of living | 4.22 | 0.628 |
| Tourism provides important tax revenues which benefit my neighborhood | 4.16 | 0.792 |
| The tourism industry can help my community grow and provide many job opportunities for residents | 4.03 | 0.667 |
| Tourism development increases the amount of crime in the community | 3.98 | 0.810 |
| I favor building new tourism facilities that will attract more tourists | 3.96 | 0.764 |
| Macau Government Tourist Office should do more to promote tourism within the community | 3.88 | 0.706 |
| My community should plan and manage more the development of tourism | 3.88 | 0.453 |
| A further increase in tourists will lead to friction between local residents and tourists | 3.88 | 0.735 |
| Tourism results in more litter in my neighborhood | 3.83 | 0.828 |
| Tourism has a vital role in the community and holds great promise to my community's future | 3.82 | 0.781 |
| Tourism provides incentives for the restoration of historic buildings and improves the appearance of my neighborhood | 3.78 | 0.605 |
| The overall benefits of tourism outweigh the negative impacts | 3.63 | 0.684 |
| Tourism increases the shopping opportunities for the community | 3.62 | 0.772 |
| Tourism helps preserve the cultural identity of my community | 3.46 | 0.880 |
| Tourists affect a community's way of life negatively | 3.40 | 0.753 |
| I would personally benefit from tourism development | 3.36 | 0.812 |
| Tourism causes too much change in my traditional local culture | 3.35 | 0.824 |
| Tourism promotes cultural exchange and education | 3.28 | 0.751 |
| The quality of public service and life in my community has improved due to tourism development | 3.13 | 0.928 |
| I am happy and proud to see tourists coming to my community | 3.09 | 0.820 |
| Because of tourism, communities develop more parks and recreational areas that local residents can use | 2.45 | 1.073 |

**Attitudes toward tourism between those who work in tourism and other industries**

An examination was carried out to determine if attitudes toward tourism differed depending on whether a Macao resident had worked or were presently working in the tourism industry or were working into another sector. An independent sample t-test was conducted to compare the means of these two groups revealing statistically significant differences (≤0.05) in 14 of the original 23 impact variables (Table 5). A comparison of the means showed that respondents who had worked or currently were working in the tourism industry had a higher rating on the personal benefit from tourism development (3.71) than those who were not working in tourism (3.06). There was greater distinction between the two group profiles on the economic and community benefits of tourism. Those working or who had worked in industry felt much stronger economic benefits (tax revenues, job creation) and noneconomic benefits (community growth and as a vital role for the community) than those who didn't work in the industry. Those who worked or had worked in tourism felt that the overall benefits from the industry outweighed the negative impacts (3.81) compared with those who didn't work in the industry (3.48), but also felt that the national tourism office, the Macau Government Tourist Office should do more to promote tourism within the community. Hypothesis 2 is therefore supported. With over half of the resident respondents confirming they did not work in tourism and were more inclined to be negative on tourism development compared to those in the industry, any government actions to address perceived impacts should specifically address this split in community opinions. Table 5.Resident attitudes toward tourism with statistical differences (working or had worked in tourism compared to working in another sector).

| **Impact variables** | **Work in tourism industry (mean)** | **Not working in tourism industry (mean)** | **P value** |
| --- | --- | --- | --- |
| Tourism provides important tax revenues which benefit my neighborhood | 4.32 | 4.03 | 0.000\* |
| The tourism industry can help my community grow and provide many job opportunities for residents | 4.14 | 3.94 | 0.005\* |
| I favor building new tourism facilities that will attract more tourists | 4.12 | 3.82 | 0.000\* |
| Tourism has a vital role in the community and holds great promise to my community's future | 4.00 | 3.67 | 0.000\* |
| Macau Government Tourist Office should do more to promote tourism within the community | 3.98 | 3.80 | 0.019\* |
| The overall benefits of tourism outweigh the negative impacts | 3.81 | 3.48 | 0.000\* |
| Tourism increases the shopping opportunities for the community | 3.78 | 3.49 | 0.000\* |
| I would personally benefit from tourism development | 3.71 | 3.06 | 0.000\* |
| The quality of public service and life in my community has improved due to tourism development | 3.41 | 2.88 | 0.000\* |
| Tourism promotes cultural exchange and education | 3.37 | 3.21 | 0.048\* |
| I am happy and proud to see tourists coming to my community | 3.29 | 2.92 | 0.000\* |
| Tourists affect a community's way of life negatively | 3.23 | 3.56 | 0.000\* |
| Tourism causes too much change in my traditional local culture | 3.22 | 3.46 | 0.007\* |
| Because of tourism, communities develop more parks and recreational areas that local residents can use | 2.60 | 2.33 | 0.018\* |

\*Statistically significant (≤0.05).

**Acceptability of tourism options**

Literature has shown that while residents may be less or more supportive of tourism development, residents can also display different levels of support for certain tourism product and service development options. The introduction, enhancement, reduction, or elimination of tourism products or services could be strategically used to harness greater support for tourism development. With this in mind, Macao resident respondents were asked on their acceptance of tourism options in the casino resorts (Table 6) and within the city (Table 7). This was again examined according to whether the respondent worked or had worked in Macao's tourism industry, or was employed in another sector. A scaling of 1 (not acceptable) to 5 (very acceptable) was used. Table 6.Acceptability of tourism development options in the casino resorts.

| **Variable** | **Overall mean** | **Work in tourism industry (Mean)** | **Not working in tourism industry (Mean)** | **P value** |
| --- | --- | --- | --- | --- |
| Performances and concerts | 3.95 | 3.97 | 3.94 | 0.748 |
| Dining | 3.94 | 3.89 | 3.98 | 0.289 |
| Hotels | 3.88 | 3.92 | 3.85 | 0.445 |
| Retail stores | 3.83 | 3.88 | 3.80 | 0.394 |
| Meetings, incentives, conventions, exhibitions (MICE) | 3.51 | 3.54 | 3.49 | 0.580 |
| Festivals | 3.42 | 3.43 | 3.41 | 0.900 |
| Cinemas | 3.22 | 3.22 | 3.22 | 1.000 |
| Car parks | 2.91 | 3.89 | 3.98 | 0.289 |
| Casinos | 2.54 | 2.98 | 2.16 | 0.000\* |

\*Statistically significant (≤0.05).Table 7.Acceptability of tourism development options within the city.

| **Variable** | **Overall mean** | **Work in tourism industry (mean)** | **Not working in tourism industry (mean)** | **P value** |
| --- | --- | --- | --- | --- |
| Public transportation—light rail | 3.92 | 3.95 | 3.89 | 0.611 |
| Amusement parks | 3.82 | 3.87 | 3.78 | 0.444 |
| Hospitals | 3.82 | 3.70 | 3.92 | 0.051 |
| Cycling tracks | 3.65 | 3.59 | 3.70 | 0.307 |
| Historic and cultural attractions | 3.55 | 3.51 | 3.58 | 0.428 |
| Gardens and parks | 3.44 | 3.24 | 3.60 | 0.001\* |
| Public transportation—taxi | 3.27 | 3.24 | 3.30 | 0.619 |
| Pedestrian walkways | 3.15 | 3.03 | 3.24 | 0.038\* |
| Public transportation—bus | 2.69 | 2.63 | 2.74 | 0.407 |

\*Statistically significant (≤0.05).

Within the casino resorts, performances and concerts (3.95), dining (3.94), hotels (3.88), and retail stores (3.83) were highly supported with casinos least supported (2.54) by the resident respondents. Casinos were the only tourism development option that recorded a statistical difference (≤0.05) in the level of support with those working in the tourism industry more supportive than those not. Outside the casino resorts, there was support for a light rail public transportation mode (3.92), amusement parks (3.82), hospitals (3.82), and cycling tracks (3.65). There were statistical differences (≤0.05) in the level of support for gardens and parks and pedestrian walkways between those who worked in tourism compared to those who did not. Those who did not work in tourism found these products more acceptable for Macao. Hypothesis 3 is therefore rejected as there is a large degree of consensus between those residents who were working or had worked in tourism compared to those working in another sector in Macao on those products more acceptable to the community looking to the future of Macao.

Macao has developed into a major casino city and with this a significant level of economic dependency on casino revenues. Yet resident respondents have shown this product to be less acceptable for ongoing tourism development compared with high support for nongaming products such as events, entertainment (amusement park), dining, and shopping which Macao residents can also consume. Moving away from the reliance on getting around Macao's increasingly congested roadways by car, taxi, or bus (with bus public transportation rated neutral and the lowest as a product to develop), a light rail public transportation system and cycling tracks were viewed with greater acceptance.

**Discussion**

In the past decade, Macao has rapidly emerged as a casino city and global leader in the casino industry in terms of gross gaming revenues. With envious gaming revenues and significant tax contributions to Macao Government coffers to be invested in a city of just over a half a million, resident disquiet and irritation has set in. This study revealed that resident attitudes toward tourism were generally negative although this industry represents most of Macao Government's GDP and a major employer of local residents. This sentiment was based on noneconomic factors of the environment that was being created in Macao through overcrowding and traffic congestion as well a negative sentiment to the rising costs of living. While there was agreement that tourism was good for community growth and employment, there was a wish to see the Macau Government Tourist Office do more in the community to promote tourism. As postulated by social exchange theory in tourism, residents will evaluate the costs and benefits of the tourism exchanges. There can be a mix of some residents evaluating a positive exchange while others view it negatively. The net outcome from this research for Macao is in general more negative, which based on social exchange theory can mean that tourism is delivered with less positive enthusiasm to visitors. There should be greater positive sentiment and support toward Macao's tourism industry considering Macao's economic reliance on this sector. Residents who had or currently working in the tourism industry perceived greater benefits than social costs from tourism development compared to those not working in the industry. This split in opinion suggests that less of the perceived benefits from Macao's significant tourism growth and tax revenues to government coffers in recent years are reaching those working in other industries.

This study also found that some development options were perceived as more acceptable while others, in particular casinos, were viewed with less acceptability. Nongaming elements were widely accepted by resident respondents such as performances, concerts, dining, and retail. These are also products and services suitable for all age groups and family backgrounds. The present traffic congestion issues were viewed with fewer acceptances with a call for a train system and less reliance on cars, buses, and car parks. More entertainment through amusement parks was also viewed highly along with more hospitals. This result is in line with current public sentiment as Macao residents regularly experience traffic congestion with an increasing number of vehicles on the streets caused by more resident cars, construction vehicles, casino buses and limos, and cars with Chinese registration permitted to enter Macao from China. Despite being a global leader in the gaming industry in terms of revenue, Macao has no theme park. There are also concerns on an inadequate health system and hospitality care in line with the expanding number of Macao residents, migrant workers, and tourists.

Resident respondent views for more nongaming facilities are also in line with the call by the Macao and Chinese Governments for Macao tourism industry to hasten the diversification of tourism beyond gaming. The development or introduction of products and services shown to be more supportive in this research by Macao residents could be used tactically to influence resident attitudes. The findings have shown that while Macao has been witness to the largest casino growth and gross gaming revenues globally this has not translated down to community endorsement of a tourism direction that they fully wish to see continue in its present form. To ignore and not solve issues such as traffic congestion, overcrowding, and inflation, this could create further negative impressions toward tourism in the future and support for future casino resort development that attaches minimal attention to nongaming diversification. It is also a scenario that could further diminish factors such as the quality of exchanges between resident and visitor.

**Conclusion and implications of the findings**

Residents' acceptability toward tourism development and tourism options is dynamic and as such should be monitored over time. Based on social exchange theory, the negative sentiment by Macao residents could impact the delivery of tourism services as many in the community work in tourism or live in a community close to tourism locations. Resident respondents acknowledge tourism as a significant contributor to government coffers and employment opportunities, yet several negative attitudes persist. This research showed the resident sample concerned more on noneconomic environmental and declining esthetic conditions such as traffic congestion, overcrowding, and living costs with the hope of improved public transportation and leisure offerings with less emphasis on casino developments. The development of various products and services could impact resident attitudes toward tourism creating more favorable impressions. The research highlighted development options favored both inside the integrated resorts and within the city based on better transportation infrastructure, further leisure and entertainment options and more hospitals. Although not the basis of this research, casino development could still be supported by Macao residents if this was more proportionate to the growth on other nongaming facilities viewed important by Macao residents. However, this would be an issue for future research.

Having a better understanding of residents with certain demographic backgrounds and their perceptions toward tourism and tourism development options could assist the Macao Government in better predicting the reactions of community groups in the future and what measures could more strategically increase the level of support. This study found that residents who had not worked in the tourism industry were significantly less supportive of casino development. Given the economic importance of Macao's growing casino industry and to minimize these perceived negative impacts of gaming by this large group of residents, the Macao Government should proactively engage this group to listen to their concerns and launch appropriate measures to lessen worries and adverse impressions. The aim would be to achieve and maximize perceived net benefits from tourism a central issue in social exchange theory.

A decade of rapid tourism development in Macao has shown more residents are becoming irritated by an increasing number of tourists and resulting congestion. With a tourism master plan being considered by Macao (Macau Government Tourism Office, 2015a, 2015b), it is imperative that addressing and continually monitoring resident concerns be part of this plan. The policies that the tourism master plan suggests should be in line with influencing and limiting community and environmental impacts. A Light Railway Transit sky train is currently under construction but heavily delayed by nearly three years and with costs increasing from an initial projection of USD0.53 billion in 2007 to USD1.79 billion in 2013. Phase 1 of the project is expected to open in late 2017 (Filipe, 2015). Such delays and surges in construction costs to Macao's infrastructure will do little to quell negative resident sentiments found in this study. This study has shown that greater attention should be given to noneconomic factors as a framework to instill greater positive community sentiment around Macao's future tourism development. The research findings show that an overreliance and continued focus on casino development may only create further negative feelings toward Macao's tourism development if not offset by an appropriate development of nongaming related facilities. Some of the positive responses on the vital role that tourism plays in the community and in preserving cultural identity (Table 4) need greater reinforcement while those creating strong negative attitudes such as traffic congestion, overcrowding, and rising cost of living would need corrective action to appease resident sentiment.

By measuring resident attitudes toward tourism and their acceptability among different development options, this study has provided important implications and direction for the Macao Government as well as other tourism entities who profited from the expansions such as the six casino operators, and in creating the possibility of a tourism industry better aligned to the needs and concerns of Macao's resident community. Macao residents ultimately are the destination hosts and therefore in the long run it is this tourism stakeholder and their value domains that can have significant influence on the success of Macao's future visitation and tourism industry.

**Limitations and future research**

The sample could be expanded to question more in the community. Further research could be conducted on various demographic clusters to determine the levels of support between neighborhood districts, age ranges, education, and household structure. With so many working in Macao's tourism industry, there is a possibility of several in the family hierarchy being involved and with different tourism roles and therefore with a variation in attitudes based on these profiles. Actions and messages could therefore be designed based on various community cluster views.

In this research the level of attachment to Macao's tourism industry was judged on whether the resident had worked in tourism (and therefore was aware to some degree on tourism benefits) or was working in tourism and comparing this to those who were not working in tourism. This could be further developed based on length of time in the industry, level of engagement with the industry, and benefits received from the industry such as remuneration packages. With nearly 90% of Macao's revenues generated from tourism a greater categorizing of which sectors and job roles in Macao benefit from tourism would be needed. Some who answered that they didn't link their employment to the tourism industry may benefit significantly from it as shown by Macao's mega integrated resorts which rely on multiple industries such as IT, automobile, ***agriculture***, security services, legal services, real estate, construction and engineering, and public utility companies. Macao residents will also include overseas nationals who have qualified for Macao residency. Place attachment, on whether the resident was born in Macao or not, could be investigated to see if those born in Macao compared to recent Macao residents who may also have residency in their home country, differ on their view toward Macao's tourism development.

While relatively small geographically compared to its global casino footprint there is still the possibility that the benefits of Macao's tourism development are not reaching all of Macao's neighborhoods proportionately. Future research could measure Macao residents' attitude toward tourism in each neighborhood and development options preferred in order to better strategize how more support can be harnessed from the community for the overall tourism development in Macao.

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[***A Comparative Analysis of Contraceptive Use in Africa: Evidence from DHS***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:6BH2-VXY1-JBMY-H3X4-00000-00&context=1516831)

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**ABSTRACT**

The aim of this article is to show a comparative analysis of contraceptive use in areas of traditionally high fertility that have gone through profound changes. ***Data*** have been taken from the latest Demographic and Health ***Surveys*** (DHS). Logistic regression models were adopted for four selected representative countries, namely Egypt, Mali, Namibia and Niger. There were two selection criteria: ***data*** should be recent, and selected countries should have high (Egypt 57.4%; Namibia 46.4%) or low (Mali 7.5%; Niger 10.0%) contraceptive use. The probability of using contraception when a woman has had one to four children is 2.4 times higher than when they have had no children. Contraception ***data*** are always gathered at a point of time, but cross-sectional ***data*** are not sufficient to understand all the mechanisms hidden behind contraceptive use. Different contraceptive behaviours need good estimation tools to develop specific family planning programmes.

**FULL TEXT**

**Background**

The objective of the global action plan of the Cairo conference was to favour economic and social development through the control of demographic growth. To achieve this aim, African countries will have to manage to reduce their general mortality, infant mortality and maternal mortality and to decrease their high fertility to finally favour a certain stabilization of the world population. To achieve such aims, family planning was one of the most preferred tools, through better contraceptive use. To understand the levels and trends of contraception use (Montgomery and Casterline, 1996), it is important to have a good idea of the social situation and the social issues on the continent.

Different policies put in place here and there consist of developing family planning activities (training of health personnel, educational activities, clinical services, etc.). Today, one can see that such policies were not implemented everywhere with the same vigour (Bongarts and Sinding, 2009; Clement and Madise, 2004). The gap is revealed by comparing urban and rural areas. One can therefore justifiably wonder about the causes of these discrepancies. The more important means of contraception were developed in the urban areas where the fertility levels were the lowest (Bongaarts, Mauldin and Phillips, 1990). Together with the urbanization and dispersal of better education strategies, the level of instruction rose in the urban areas, leading to easier access to information, especially medical information related to contraception (Caldwell and Caldwell, 1988; Cleland and Rutstein, 1986; Oyedokun, 2007; Tankoano, 1989). Rural areas are devoid of such structures (sanitary and education infrastructures) which could facilitate people’s knowledge and practice of contraception. The inadequacies in educational structures increase difficulties in accessing contraceptive information (Sathiya Susuman, 2009). As a consequence, there is a great necessity for additional efforts and means of communication related to this matter.

In addition to this lack of educational structures, there is an inadequacy of healthcare structures in many African countries. They are not only limited, but the population has restricted access to them. The rural population is generally scattered in huge geographical areas with sometimes a single inadequate and poorly equipped health centre (Podhisita, 1998; Sahran, and Valente, 2002). The aim of a real diffusion of contraception practices pre-supposes easy access to family planning centres dedicated to the specific issues of each population and staffed by health workers, matrons and sanitary educators who are well trained. The advance in favourable behaviours towards family planning seems to be partly due to the effects of the crisis and one could think that it should reach the rural regions. Aspirations for a reduced family can be perceived in the premises of fertility decline in rural areas (Delaunay, 1998), though one cannot affirm that the decrease in fertility is only due to contraception.

Family planning is perceived by international authorities as the most effective means to ameliorate the general quality of life while developing the health status of the mother and the child. By the same token, it gives governments a chance to lighten the pressure on themselves regarding the social and economic needs that they will not have to carry (Population Reference Bureau, 2008). The implementation of such policies is not without problems. On the one hand, there are some factors which facilitate the changes of behaviours and, on the other hand, factors which require the intervention of governments through big institutional measures (economic incentives or family planning, for instance). The continuing development of African capitals makes urbanization become a precursor element of change and constitutes the base of diffusion of new ideas and new demographic behaviours (Ross and Winfrey, 2001).

Use of contraception is generally very limited in most of Africa except in a few east African and southern African countries like Kenya, Botswana, and Zimbabwe which benefitted early from the introduction of clinics (Muhwava, 2003). These countries were the first ones to admit their high levels of fertility. Everywhere else, the conscientiousness grew, but family planning programmes were very dissimilar. There were indeed some countries which were very late implementing any programmes (Locoh and Makdessi, 1996). Following the Knowledge Aptitude Practice ***surveys*** (KAP), the Demographic and Health ***Survey*** (DHS) were implemented and permitted to gauge the results of these policies. These ***statistics*** revealed strong disparities among countries. One has to recognize that huge efforts were made in a variety of ways, but efficacy, especially in rural areas, could not always be assured.

Why would African countries have an interest in controlling their populations’ growth? What are the stakes in terms of employment, health and education? What is the role of family planning for their economic development? Most of the developing countries have finally considered the rapid growth of their populations and its consequences as a big challenge (Amegee, 2001; Charbit, 2002; Demographic and Health ***Survey***, 2003). The principal problem of this growth is the aggravation of pauperization. The fear of its intensification exists in particular in African capitals with high urban growth. This observation is essential to understanding family planning programmes. The economic crisis has been a pre-condition for implementation of birth control policies, and understanding the economic issues is a pre-requisite to understanding the stakes of contraception and unsatisfied needs for contraception in Africa (Westoff, 1974; Wilder, 2007).

The United Nations ran their first ***survey*** in 1976, when 37% of African governments considered that their national fertility was too high. These ***surveys*** showed the evolution of the positions. The gap between partisans of reduction and the ones in favour of ‘laissez faire’ continued to mount (United Nations, 2009a). A wider consensus was indeed obtained at the African Population Conference in Arusha (Tanzania) in 1984, with the adoption of the ‘Kilimanjaro action programme’ (United Nations, 1998). Between the Bucharest conference and just before the second conference in Mexico, the proportion of countries in favour of an intervention for diminution went from 38% to 49%. This proportion rose to 61% two years after the Mexico conference. In the meantime, there was a deterioration of the principal rates of basic products (petrol, minerals, and metals) as well as ***agricultural*** production (fishing, cattle rearing, and forestry resources) together with a heavier external debt. In parallel, the demographic burden was rising higher and higher (3% of the annual population growth). Times after the Mexico conference are marked by an important change in the attitude of governments towards family planning. As a first concrete action which reflected this change of attitudes, public authorities gave official support for the utilization of modern contraceptives (United Nations, 2004).

In this situation, the study of relationships between individuals and the social environment is essential for one to understand the diffusion of new values in a rural society (Van de Walle, and Foster, 1990). In particular, regarding a comparative analysis of contraception and fertility, several studies carried out in Africa (Amegee, 2001; Caldwell, and Caldwell, 1988; Donadje, 1992; Mokima, 1992) show the impact of the family circle in the couple’s decision making. A couple’s choices of fertility and education of their children are, at the same time, individual and collective. The individual is influenced by an organized and structured social framework. The place of the couple in this environment is dictated by laws and customs which have their sources in the family’s traditions. This way of life allows the close extended family a say in family matters and in particular on all questions related to fertility (Ezeh, and Mboup, 1997; Mesganaw, 2006). The patriarchal system is the base of this social ideal. The man has all the rights pertaining to the constitution of his descent. And because a large descent is venerated, he will try to maximize it (Freedman and Berelson, 1976; Westoff and Bankole, 2000). The community makes sure that this optimization is effective. The female only exists in this society through conforming with strict rules. Yet, a large descent is a guarantee for social recognition of the husband but also of the wife. As a consequence, the biological reproductive conception of the community sphere translates necessarily into procreation decisions (Lapham and Mauldin, 1972). The levirate, sororate and polygamous traditions are examples which show the fertility perspective of these populations.

The factor of contraception appears to be more and more necessary to approach the fertility decline in Africa. One cannot speak today of the decrease of fertility in certain African countries without taking note of the upsurge of contraceptive practices. The beginning of the decline of fertility, even if largely attributable to first marrying at a later age, cannot be mentioned without reference to contraception which has slowly entered African customs. The retrospective ***surveys*** run within the frames of international programmes make it possible to follow the evolution of the knowledge and practice of contraception in Africa. We now turn to ***data*** and methodological issues involved in testing the change in contraceptive use and fertility we have just presented.

***Data* and Methods**

The Demographic and Health ***Surveys*** are household ***surveys*** which are designed to be nationally representative. These ***surveys*** provide a large range of ***data*** in the areas of health, nutrition and general population issues. The aim of the DHS was to provide comprehensive information on fertility and mortality, maternal and child health, family planning, fertility preferences, and on knowledge and behaviour concerning HIV/AIDS. Such ***surveys*** are ideally implemented every five years to allow comparisons in time, yet several countries do not offer a ***survey*** every five years. The DHS are large ***surveys*** covering in general between 5000–30,000 households, and can be complemented by interim ***surveys*** with smaller samples. Analysing the DHS, we present an overview of the contraceptive situation in Africa (Gribble, 2003; Ministry of Health and Social Services, 2003) and we would like to highlight in more detail the potential factors that could influence contraceptive use. To do so, we have chosen certain countries as examples. Our choice was based on two criteria: ***data*** should be recent, and the selected countries should have high or low contraceptive use.

**Variable Selection**

The analysis is made country by country before grouping them into regional areas as northern, western, central, eastern and southern Africa, and by other critical variables such as main religion or main language spoken. Finally, it is a global African overview that we develop. For each country and each ***survey*** we consider variables on contraceptive use. The point is to create tables by age and contraceptive methods used. Using these comprehensive tables as a starting point, we create summary tables which highlight the type of users to put emphasis on the category of background characteristics. The analysis, thanks to the large sample, is a direct analysis based on cross tabulations (not shown). The cross-tabulations are mainly organized around contraceptive behaviour and age, as one point of this study is to look at the technical aspect of the estimation of contraceptive use and fertility. To consider the reasons and variables influencing contraception, we use logistic regression to go into a more detailed analysis of socio-economic factors such as, for instance, education of respondent, education of partner, wealth status, place of residence, religion, and so on.

The specific variables we used can be categorized as follows:

*Sample weight* (variable V005 in the ***data*** sets): the variable is used to obtain a representative sample of women aged 15–49 in each country.

*Year of interview* (variable V007 in the ***data*** sets).

*Age* (variable V013 in the ***data*** sets): the variable selected for the study was a five-year age group, sorted into seven specific age groups: 15–19, 20–24, 25–29, 30–34, 35–39, 40–44 and 45–49.

*Type of residence* (variable V025 in the ***data*** sets): type of residence was sorted into rural or urban place of actual residence, as well as the region of residence.

*Highest educationlevel of the respondent* (variable V106 in the ***data*** sets) and *her partner* (variable V704 in the ***data*** sets): the education level was the highest attended type of schooling. It was sorted into: never attended school, primary education, secondary education, tertiary or higher education.

*Professional status of the respondent*: the professional status was sorted into working or not working (without going into labour categories, as the great majority of the working females in Africa were employed in the ***agricultural*** sector).

*Size of the household* (variable V136 in the ***data*** sets): the size of the household was expressed in terms of number of household members.

*Relationship between respondent and head of household* (variable V150 in the ***data*** sets): this category was considered as the respondent being the head of household or not.

*Gender of head of household* (variable V151 in the ***data*** sets): this category was sorted into household head male or female.

*Decision-making for contraceptive use*: this category showed the degree of decision of the female in the household (low, middle, high).

*Religion* (variable V130 in the ***data*** sets): the religion considered is the religion which the respondent considered they belonged to. The categories were: Animist, Catholic, Christian (when the difference was not made among Christians groups), Muslim, Orthodox, Protestant, other and no religion.

*Number of childrenever born* (variable V201 in the ***data*** sets): this variable was asked to the respondent to establish the number of children born alive that she had ever had.

*Number of living children* (variable V213 in the ***data*** sets): this variable was asked to the respondent to establish the number of children still alive that she had.

*Age at first birth* (variable V212 in the ***data*** sets): the respondent was asked her age in completed years at first birth, if she had ever given birth.

*Pregnancy* (variable V218 in the ***data*** sets): the respondent was asked if she was pregnant at the time of the interview (yes or no). This variable was particularly important for the category ‘reason not to use contraception’.

*Use of contraception* (variable V312 in the ***data*** sets): the respondent was asked which contraceptive methods she used at the time of the interview. The respondent had the choice between several methods: pill, condoms, the intrauterine device (IUD), injections, implants, diaphragm, male sterilization, female sterilization, rhythm abstinence, withdrawal or other methods.

Also, a host of new variables were created, recoded from existing variables. For instance, current contraceptive use was a key variable and it has been re-coded into current contraceptive users and non-current contraceptive users. Users were subdivided into users of modern methods and traditional methods and non-users were themselves sorted into non-users with reason not to use, and non-users with no reason not to use (non-users not presented here). The logistic regression model by contraceptive users was for four selected representative countries: Egypt, Mali, Namibia and Niger.

**Statistical Analysis**

The analysis summary ***statistics*** were obtained to see which variables were significant for further analysis, and means, standard deviations, chi-square and degrees of freedom were calculated for the selected variables. Cross tabulations were run in examining the association between contraceptive use, the type of contraceptive use and the age of the females. These cross-tabulations were of the utmost importance as they show the evolution of rates of contraceptive use by age, and also permit us to understand the structure of the population under study (not presented here). Moreover, it enables the researcher to show the evolution in time when at least two ***surveys*** were available. Logistic regressions analysis was used for four countries: Egypt, Mali, Namibia and Niger. These countries were chosen because of their high (Egypt and Namibia) and low (Mali and Niger) contraceptive use. From these four countries, which we considered representative of the different situations one can find in the continent, we tried to understand the impact of demographic and socio-economic variables on the use of contraception in Africa.

**Findings**

**Descriptive Analysis**

Table 1 shows the four countries we chose which we believe give a good picture of the continent: two countries with high contraceptive use (Egypt 57.4%; and Namibia 46.4%), and two countries with low contraceptive use (Mali 7.5%; and Niger 10.0%).

**Table 1.**

Africa: summary table of use and non-use of contraception by country and year of ***survey***.

| **Country** | **Year** | **Population size** | **Users of modern methods** | **Users of traditional methods** | **Total users** | **Total non-users** | **Non-declared** | **Total** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Benin | 2006 | 17,789 | 6.7 | 10.6 | 17.3 | 82.6 | 0.1 | 100 |
| Burkina-Faso | 2003 | 12,463 | 10.2 | 3.7 | 13.9 | 86.1 | 0 | 100 |
| Chad | 2004 | 6032 | 1.4 | 1.1 | 2.5 | 91.2 | 6.3 | 100 |
| Congo | 2005 | 7036 | 13.4 | 30.5 | 43.9 | 55.5 | 0.6 | 100 |
| DRC | 2007 | 9995 | 6.6 | 13.5 | 20.1 | 79.9 | 0 | 100 |
| **Egypt** | **2008** | **14,678** | **54.9** | **2.5** | **57.4** | **40.8** | **1.7** | **100** |
| Ethiopia | 2005 | 14,070 | 9.5 | 0.8 | 10.3 | 89.6 | 0.1 | 100 |
| Ghana | 2003 | 5691 | 14.8 | 5.9 | 20.7 | 79.2 | 0.2 | 100 |
| Guinea | 2005 | 7954 | 5.5 | 5 | 10.5 | 89.5 | 0 | 100 |
| Kenya | 2003 | 8195 | 22.7 | 5.6 | 28.4 | 71.6 | 0.1 | 100 |
| Lesotho | 2004 | 6495 | 27.3 | 1.4 | 28.6 | 70.5 | 0.9 | 100 |
| Liberia | 2007 | 7091 | 11.7 | 1.6 | 13.3 | 86.7 | 0 | 100 |
| Madagascar | 2004 | 8383 | 12.8 | 8.6 | 21.4 | 78.6 | 0 | 100 |
| Malawi | 2004 | 11,692 | 22.4 | 3.2 | 25.7 | 74.3 | 0 | 100 |
| **Mali** | **2006** | **14,583** | **5.6** | **1.9** | **7.5** | **92.3** | **0.2** | **100** |
| Morocco | 2003 | 17,050 | 26.2 | 6.6 | 32.8 | 65.7 | 1.5 | 100 |
| Mozambique | 2003 | 12,587 | 15.1 | 4.2 | 19.3 | 71 | 9.7 | 100 |
| **Namibia** | **2007** | **9836** | **45.2** | **1.3** | **46.4** | **53.2** | **0.4** | **100** |
| **Niger** | **2006** | **9222** | **4.5** | **5.5** | **10** | **90** | **0** | **100** |
| Nigeria | 2003 | 7615 | 7.7 | 5.5 | 13.2 | 86.2 | 0.6 | 100 |
| Rwanda | 2005 | 11,317 | 4.8 | 4.8 | 9.6 | 90.2 | 0.2 | 100 |
| Senegal | 2005 | 14,602 | 7 | 1.7 | 8.7 | 91.3 | 0 | 100 |
| Swaziland | 2007 | 4987 | 35.4 | 2.4 | 37.9 | 62.1 | 0 | 100 |
| Tanzania | 2004 | 10,289 | 20.5 | 1.7 | 22.1 | 77.9 | 0 | 100 |
| Uganda | 2006 | 8528 | 15.3 | 4.2 | 19.5 | 80 | 0.5 | 100 |
| Zambia | 2007 | 7146 | 20.4 | 9.5 | 29.9 | 70.1 | 0 | 100 |
| Zimbabwe | 2006 | 8907 | 38.4 | 1.7 | 40.1 | 59.8 | 0.1 | 100 |

*Sources*: Demographic and Health ***Surveys***

Because of wealth issues and the socio-economic development of these countries, females might have problems in accessing contraception for financial and logistic reasons. Yet females could use a natural method to prevent unwanted pregnancies, methods which do not require money, or particular medical advice (Gribble, 2003). But it is very interesting to note that, when females use contraception, they use more modern methods above traditional ones.

The same proportions are found in Mali with 2.6% of females using the pill, 2.2% injections, and only 0.7% periodic abstinence, or 0.5% the withdrawal method. In other words, in Mali 5.6% of the females use a modern method while 1.9% use a traditional method. In Ethiopia, 9.5% of females choose modern methods, with only 0.8% choosing a natural one, and in Senegal 7% of users employ modern contraception, against 1.7% of users employing traditional methods. Egypt is indeed the country with the highest contraceptive use (57.4%). Namibia, with a high contraceptive use (46.4% in 2007) represents the southern African countries in terms of contraceptive behaviours.

These results show that contraceptive use is not only a matter of access to contraception, as potentially everyone can access natural methods, but rather a matter of socio-political choices of public authorities to focus on diffusion of modern contraception on the one hand, and a matter of influence of culture and society itself over the fertility preferences of the individuals, on the other hand. For the four countries, we controlled for the following variables: age of respondent, number of living children, religion, education level of the respondent and her partner, wealth category, work status, place and region of residence. For clarity, we kept in our tables, displayed in this section, the variables which were meaningful; in other words, only the variables which were statistically significant and had an impact on the contraceptive use. For each significant variable we looked at the odd ratios, which inform us about the probability to use (or not to use) according to different categories inside the same variable, when compared to a control group. For instance, if we look at the role of education, we will see whether the chance to use contraception increases with education level or not. This regression analysis will be first presented for countries with high contraceptive prevalence (Egypt and Namibia) and then for countries with low contraceptive prevalence (Mali and Niger).

Figure 1 shows the geographical distribution of the different level of contraceptive use and enables us to locate the different type of countries according to their attitude towards contraception. Countries of type I are essentially concentrated in West Africa.

**Figure 1.**

Africa: map of proportions of females 15–49 years old who use any contraceptive methods.

*Sources*: Demographic and Health ***Surveys***

The map in Figure 1 depicts the proportions of users of contraception regardless of modern or traditional methods in Africa. The results shown on this map correspond to the latest ***survey*** for each country where a Demographic and Health ***Survey*** was available. The four different groups of countries found on this map indicate four different levels of contraceptive use. As one can see, contraceptive use is very low in countries belonging to the category of group I. Contraceptive use is almost non-existent in Chad in 2004 with a mere 2.5% of users of all methods. The level of contraceptive use is also particularly low in Mali in 2006 with 7.5% of females using contraception. In Rwanda in 2005 the contraceptive use rate is also below 10% (9.6%). Niger just reached 10% in 2006. We decided to include Ethiopia with 10.3% as well as Guinea 10.5% in this category, as the level of contraception was very close to 10% and because the characteristics of these two countries were similar to the other countries belonging to this first group. Indeed, these countries are among the poorest in Africa.

**Regression Model by Selected Background Characteristics on Contraceptive use in Selected Countries**

**Egypt 2008**

Egypt is a country with a high proportion of users. It is interesting to first look at the factors that can influence this use. In this first model, we tried to understand which variables had a potential impact on contraceptive use. For instance, we wanted to understand if working status plays a role and, if so, whether working or not working makes females use more contraception. By looking at each variable and its categories, we will be able to see what will be the best tools for family planning programmes. The probability of being a contraceptive user changes among the age groups. When females are 20–24 years old they are 7.2 times more likely to use contraception than when they are 15–19 years old (see table 2). When we compare the older ages to this youngest reference group, one can observe that the probabilities are always higher, but seem to decrease after 25 years old. Indeed, at 25–29, females are 5.5 times more likely to use contraception and the probability will decline to around 3.0 times for the older groups. This trend is normal and similar to the one that one can find in developed countries, with the highest probabilities to use contraception concentrated between the ages of 25 and 39 years old.

**Table 2.**

Regression model (95% CI) predicting the respondents’ selected background characteristics on contraceptive use in selected countries.

| **Variables** | **Egypt 2008** | **Namibia 2007** | **Mali 2006** | **Niger 2006** |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **OR** | **95% CI** | **OR** | **95% CI** | **OR** | **95% CI** | **OR** | **95% CI** |  |  |  |  |
|  |  | **lthan** | **gthan** |  | **lthan** | **gthan** |  | **lthan** | **gthan** |  | **lthan** | **gthan** |
| **Age** |  |  |  |  |  |  |  |  |  |  |  |  |
| 15–19\* | 1.0 |  |  | 1.0 |  |  | 1.0 |  |  | 1.0 |  |  |
| 20–24 | 7.3 | 5.4 | 9.7 | 1.5 | 1.2 | 2.0 | 1.1 | 0.7 | 1.5 | 0.5 | 0.3 | 0.7 |
| 25–29 | 5.5 | 4.6 | 6.5 | 2.9 | 2.4 | 3.7 | 1.9 | 1.4 | 2.6 | 1.5 | 1.1 | 2.1 |
| 30–34 | 3. 8 | 3.3 | 4.3 | 2.5 | 2.1 | 3.1 | 2.2 | 1.6 | 3 | 1.9 | 1.4 | 2.5 |
| 35–39 | 3.4 | 3.0 | 3.9 | 2.0 | 1.6 | 2.4 | 2 | 1.4 | 2.8 | 1.8 | 1.3 | 2.5 |
| 40–44 | 3.4 | 2.9 | 3.8 | 1.8 | 1.4 | 2.2 | 2.7 | 2.0 | 3.8 | 1.6 | 1.2 | 2.2 |
| 45–49 | 2.8 | 2.4 | 3.1 | 1.6 | 1.3 | 2.0 | 1.7 | 1.2 | 2.5 | 1.3 | 0.9 | 1.8 |
| **Number of living children** |  |  |  |  |  |  |  |  |  |  |  |  |
| 0\* | 1.0 |  |  | 1.0 |  |  | 1.0 |  |  | 1.0 |  |  |
| 1–4 | 1.3 | 1.1 | 1.4 | 2.4 | 1.9 | 3.2 | 1.1 | 0.9 | 1.3 | 0.9 | 0.8 | 1.2 |
| 5+ | 0.5 | 0.4 | 0.5 | 1.2 | 1.0 | 1.5 | 0.9 | 0.7 | 1.1 | 1.1 | 0.9 | 1.4 |
| **Education level** |  |  |  |  |  |  |  |  |  |  |  |  |
| No education\* | 1.0 |  |  | 1.0 |  |  | 1.0 |  |  | 1.0 |  |  |
| Primary | 1. 5 | 1.3 | 1.6 | 2.2 | 1.8 | 2.8 | 3.0 | 2.0 | 4.5 | 0.7 | 0.4 | 1.1 |
| Secondary | 0.6 | 0.6 | 0.9 | 0.7 | 0.6 | 0.8 | 0.6 | 0.4 | 0.9 | 0.9 | 0.5 | 1.8 |
| Higher | 0.8 | 0.6 | 0.9 | 0.7 | 0.5 | 0.8 | 0.4 | 0.2 | 0.7 | 0.6 | 0.4 | 1.0 |
| **Partner’s education level** |  |  |  |  |  |  |  |  |  |  |  |  |
| No education\* | 1.0 |  |  | 1.0 |  |  | 1.0 |  |  | 1.0 |  |  |
| Primary | 1.1 | 0.1 | 21.6 | 1.4 | 1.2 | 1.8 | 0.5 | 0.4 | 0.6 | 5.6 | 3.8 | 8.4 |
| Secondary | 1.1 | 0.1 | 22.2 | 1 | 0.9 | 1.2 | 3.4 | 2.5 | 4.7 | 7.9 | 5.4 | 11.6 |
| Higher | 1.1 | 0.1 | 22.2 | 1.1 | 1.0 | 1.3 | 4.3 | 3.2 | 5.7 | 12.3 | 7.6 | 19.9 |
| **Wealth category** |  |  |  |  |  |  |  |  |  |  |  |  |
| Poorest\* | 1.0 |  |  | 1.0 |  |  | 1.0 |  |  | 1.0 |  |  |
| Poorer | 0.9 | 0.7 | 1.0 | 0.7 | 0.6 | 0.9 | 0.4 | 0.3 | 0.5 | 0.9 | 0.67 | 1.2 |
| Middle | 0.8 | 0.7 | 0.9 | 0.9 | 0.8 | 1.1 | 0.5 | 0.4 | 0.6 | 0.8 | 0.6 | 1.0 |
| Richer | 0.8 | 0.7 | 0.9 | 0.8 | 0.7 | 1.0 | 0.5 | 0.3 | 0.6 | 0.7 | 0.5 | 0.9 |
| Richest | 0.8 | 0.7 | 0.9 | 1.1 | 1.0 | 1.3 | 0.8 | 0.6 | 1.0 | 0.8 | 0.6 | 1.1 |
| **Work status** |  |  |  |  |  |  |  |  |  |  |  |  |
| Not working\* | 1.0 |  |  | 1.0 |  |  | 1.0 |  |  | 1.0 |  |  |
| Working | 1.0 | 0.9 | 1.1 | 1.6 | 1.4 | 1.7 | 1.1 | 1.0 | 1.3 | 1.2 | 1.0 | 1.4 |
| **Residence** |  |  |  |  |  |  |  |  |  |  |  |  |
| Rural\* | 1.0 |  |  | 1.0 |  |  | 1.0 |  |  | 1.0 |  |  |
| Urban | 1.0 | 0.7 | 1.4 | 1.1 | 1.0 | 1.3 | 2.0 | 1.6 | 2.4 | 2.0 | 1.5 | 2.6 |

*Source*: Demographic Health ***Survey***.

**\***

reference category; OR = odds ratio; < lower level; > upper level.

If we now consider the number of living children (potential current pregnancy excluded), the results correspond to a country where females use contraception to limit birth, with the probability of using contraception increasing with the number of children alive (until five children). Females who already have one to four children have a 1.3 times higher chance of using contraception than a female without children. But for those who have had at least five children, there is a probability of using contraception 1.5 times less than childless females. In other words, females who have up to five children are more inclined to use than females who do not have a child yet, but once females reach five children, they are less inclined to use because of the age effect or cultural reasons, for instance.

Education also plays a role in contraceptive use, with the probability of use increasing with education level. A female who has primary education has 1.4 more chance of using than a female without education, but when we consider the education level of females’ partners, there is also a positive correlation between using contraception and partners’ education level.

Wealth status seems to positively influence contraceptive use. Indeed, the richer females are, the more they are likely to use contraception. When one compares the different wealth categories with the poorest category, one can see that there is a positive relationship between wealth and contraceptive use. Poorer females are 1.1 times less likely to use contraception than poorest females. Females belonging to the middle wealth category are 1.2 less likely to use than the poorest females; those belonging to the richer category are 1.2 more likely, and finally the richest women are also 1.2 times more likely to use than the poorest women in the country. Therefore the more the economic status of females increases, the more they are prone to use contraceptive methods.

Work status (obviously correlated with wealth) has a strong impact on contraceptive use. When females are working, the probability of them using contraception is equal to the probability of females not working. Therefore working status has a strong impact on contraceptive use.

When one looks at the place of living, one can see that, interestingly, there is a difference in likelihood to use contraception for females living in rural and urban areas.

**Namibia 2007**

Namibia, with a high contraceptive use (46.4% in 2007) represents the southern African countries in terms of contraceptive behaviours. Indeed, countries from this sub-region generally have the highest contraceptive use on the African continent. Because of the recent ***data*** available for this country, Namibia was selected to give a picture of contraception for the southern part of Africa in particular, and to give us insights into the role of demographic and socio-economic variables of a high contraceptive-use country in general. The regression analysis was organized by four selected countries by contraceptive users. For each model, the same variables are discussed to see the impact of these variables on the respective contraceptive behaviours.

Table 2 displays probabilities to be a contraceptive user according to selected criteria. When one looks at the probabilities to use and the age of females, one can see a normal correlation between these two variables. Indeed, the chances of being a contraceptive user increases until 34 years old, and decreases after that age. This trend is explained by the fact that the contraceptive use increases once females have reached their ideal family size, and decreases when women start to be infertile. In the case of Namibia, when one considers the age group 15–19 as the group of reference, one can see that females of 20–24 have 1.5 times more chance of using contraception than this reference group. At 25–29 years old, there is 2.9 times more chance, at 30–34 years old, there is 2.5 times more chance, at 35–39 there is 1.9 times more chance, at 40–44 years old there is 1.7 times more chance and at 45–49 years old there is 1.6 times more chance. Therefore results for Namibia correspond to a typical country where a high proportion of females practice birth control. These trends are similar to trends that one finds in western countries, with increasing probabilities until 30 years old and decreasing probabilities after that age.

Regarding the number of living children, the probability of using contraception is higher when females already had at least one child. The probability of using contraception when a woman has had one to four children is 2.4 times higher than when they had no child. When a woman had five children or more, the chances of using contraception are only 1.2 times higher than when she has none. These results are once again in perfect accordance with the contraception levels in the country. Females tend to limit their pregnancies when they have between one and four children, but once they reach five children or more, they usually do not use contraception even if they already have a large family, and often either by choice or fate.

Education reveals interesting results. In fact, one would expect that the more females are educated, the more they are prone to use. However, the regressions show that such a statement is not true. If females with primary school education have 2.2 times higher probabilities of using than their counterparts with no education, females with secondary education or higher education are less likely to use than females who never went to school (1.3 times less chance respectively). This result, if strange at first glance, can hide an age and generation effect. Indeed, females who are the most educated are the youngest, and therefore less prone to use contraception as they have not reached their ideal family size yet. The same pattern can be observed when one takes into consideration the education level of women’s partners. When a partner has completed primary school, the chances of a female using contraception are 1.4 times higher than for a partner who never attended school, but when he has a secondary or higher education level, the odds to use contraception are equal to one, which shows that education in that case does not have a great influence on contraceptive use: only no education is significant.

Wealth status does not play a positive role in contraceptive use. Indeed, it seems that the poorest females use contraception more than any other categories. Compared to the poorest (the reference category), the poorer use 1.3 times less, the females from the middle category use 1.1 times less, the richer 1.2 times less, and the richest have the same probability to use. Therefore wealth status does not seem to be an efficient tool for influencing contraceptive use. Work status seems to play a bigger role, even if the probability of using when working is only 1.6 times higher than when not working. Contraceptive use is not very responsive to the place of residence. The odds for females who live in urban areas are only 1.1 times higher than the odds for a female who lives in rural areas. Therefore, the place of residence does not have any impact on contraceptive use. In other words, only a few variables seem to play a positive role on contraceptive use: age, number of living children and, to a smaller extent, education. Indeed, socio-economic variables do not have as great or positive impacts, as demographic variables do. This model gives us insights into probabilities to use contraception according to selected variables.

**Mali 2006**

Mali is a west-African country with one of the lowest contraceptive uses on the African continent in 2006 (7.5%). By looking at the users, the unmet-needs and the intention to use, one will have a clearer idea of the variables that can help increase contraceptive use and especially decrease the proportion of unmet-needs. The likelihood of being a user in Mali differs a little from one age group to the other but not to a great extent. At 20–24 years old the probability of using is the same as at 15–19 years old. At 25–29 years females have 1.8 times more chance of using contraception than their youngest counterparts; for the age group 30–34 years old the likelihood is 2.2 times higher; for the age group 35–39, it is 2.7 times higher and, finally, at 45–49 years old, females have 1.7 times more chance of using than at 15–19 years old. Hence age only has a small effect.

Echoing age, the number of living children does not have a great impact on contraceptive use. Indeed, females with one to four children have the same probabilities to use than a female who did not have any, and when females have had at least five children, they are 1.1 times less likely to use than those who are childless.

Therefore, it is not a variable that can be effectively employed to improve contraceptive use in the country. Education has indeed a certain weight on the probability to use. When females have a primary education level, then they are 3.0 times more likely to use contraception than females who never attended school. But when education level increases, the positive impact disappears and even becomes negative. Females who have a secondary school level education are 1.4 times less prone to use contraception than females who have no schooling, and females who have a higher education level have 1.6 times less chance of using than those who have received no formal education. Therefore, increasing the general level of education of females above primary school level is not a direct answer to increasing contraceptive use. However, increasing the level of education of a female’s partner might be a solution to push contraceptive use up. When the partner has a primary education, the chances of the female using are 1.6 times lower than when the partner has no education, but when he has a secondary education level the chances of the woman using increases by 3.4 times, and when he has a higher level of education, the likelihood of using contraception is 4.3 times higher. Such results show not only the role of education, but also the importance of potential communication between husband and wife (partners) regarding family planning issues.

Interestingly, the wealth category has no positive impact on contraceptive use. On the contrary, when a female belongs to the poorer category she has 1.6 times less chance of using than when she belongs to the poorest one. For females in the middle and richer categories the likelihood to use is 1.5 times lower than the poorest. And, finally, for the richest females the chance of using is 1.2 times lower than for the poorest ones. Thus, wealth status has no positive impact on the probability of using contraception.

Working status seems to have a slight effect on contraceptive use, with the chances to use being 1.1 times higher when females work than when they do not, but this is certainly not a big difference. On the other hand, place of residence has a certain impact. Women who live in urban areas have 1.9 times higher chance of using contraception than those living in rural areas.

**Niger 2006**

Niger, on the border of west-central Africa, was selected for this regression analysis because it is one of the countries with the lowest contraceptive use (10%). So we wanted to look in more detail at the variables that can influence the use or non-use of contraception in this country, to illustrate countries with low contraceptive use. In this first model, we try to understand which variables have a potential impact on contraceptive use in Niger. The results of logistic regressions are displayed in Table 3. Except for the group 20–24 years old, which has a 1.5 times lower probability of using than the 15–19 years group, age has a positive impact on contraceptive use. At 25–29 years old, the chance of a female using contraception is 1.5 times higher than for the reference group; at 30–34 years old and 35–39 years old respectively, it is 1.9 times higher; at 40–44 years old it is 1.6 times higher; and for the oldest group, 45–49 years old, it is 1.3 times higher compared to 15–19 years old. Thus, after 25, age plays a positive role on contraceptive use.

**Table 3.**

Regression model (95% CI) predicting the respondents’ region and religion on contraceptive use in selected countries.

| **Egypt 2008** | **OR** | **95% CI** | **Namibia 2007** | **OR** | **95 % CI** | **Mali 2006** | **OR** | **95% CI** | **Niger 2006** | **OR** | **95% CI** |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **lthan** | **gthan** |  |  | **lthan** | **gthan** |  |  | **lthan** | **gthan** |  |  | **lthan** | **gthan** |
| **Region** |  |  |  | **Region** |  |  |  | **Region** |  |  |  | **Region** |  |  |  |
| L E Rural\* | 1.0 |  |  | Oshana\* | 1.0 |  |  | Sikasso\* | 1.0 |  |  | Dosso\* | 1.0 |  |  |
| U Governorates | 0.9 | 0.8 | 1.1 | Caprivi | 0.5 | 0.4 | 0.7 | Kayes | 1.0 | 0.8 | 1.4 | Agadez | 1.1 | 0.8 | 1.4 |
| L E Urban | 1.1 | 0.8 | 1.5 | Erongo | 1.0 | 0.8 | 1.2 | Koulikoro | 2.2 | 1.8 | 2.8 | Diffa | 0.4 | 0.3 | 0.6 |
| U E Urban | 0.7 | 0.6 | 0.8 | Hardap | 0.7 | 0.6 | 0.9 | Segou | 1.2 | 0.9 | 1.5 | Maradi | 2.1 | 1.6 | 2.8 |
| U E Rural | 0.5 | 0.3 | 0.7 | Karas | 0.8 | 0.6 | 1.0 | Mopti | 1.7 | 1.4 | 2.2 | Tahoua | 0.4 | 0.3 | 0.6 |
| F Governorates | 0.6 | 0.5 | 0.7 | Kavango | 0.6 | 0.5 | 0.8 | Tombouctou | 1.1 | 0.9 | 1.4 | Tillaberi | 0.9 | 0.7 | 1.2 |
|  |  |  |  | Khomas | 0.9 | 0.7 | 1.0 | Gao | 0.8 | 0.8 | 1.1 | Zinder | 2.5 | 1.9 | 3.3 |
|  |  |  |  | Kunene | 1.0 | 0.8 | 1.3 | Kidal | 0.5 | 0.3 | 0.7 | Niamey | 0.5 | 0.4 | 0.7 |
|  |  |  |  | Ohangwene | 0.4 | 0.4 | 0.6 | Bamako | 1.7 | 1.3 | 3.1 |  |  |  |  |
|  |  |  |  | Omaheke | 0.9 | 0.7 | 1.2 |  |  |  |  |  |  |  |  |
|  |  |  |  | Omusati | 0.6 | 0.5 | 0.7 |  |  |  |  |  |  |  |  |
|  |  |  |  | Oshikoto | 0.7 | 0.5 | 0.8 |  |  |  |  |  |  |  |  |
|  |  |  |  | Otjozondjupa | 0.7 | 0.5 | 0.8 |  |  |  |  |  |  |  |  |
| **Religion** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Muslim\* | 1.0 |  |  | R Catholic\* | 1.0 |  |  | Muslim \* | 1.0 |  |  | Muslim\* | 1.0 |  |  |
| Christian | 0.0 | 1.1 | 1.4 | Protestant | 0.8 | 0.3 | 2.0 | Christian | 1.2 | 1.0 | 2.6 | Christian | 1.3 | 0.4 | 3.8 |
| Others | 0.1 | 0.4 | 0.5 | No religion | 0.6 | 0.2 | 1.6 | Animist | 1.3 | 1.1 | 1.4 | Animist | 1.2 | 0.3 | 4.5 |
|  |  |  |  | Others | 1.2 | 0.4 | 3.9 | No religion | 1.6 | 0.6 | 4.3 | No religion | 0.8 | 0.2 | 3.8 |
|  |  |  |  |  |  |  |  | Others | 1.4 | 1.1 | 2.2 | Others | – | – | – |

*Source*: Demographic Health ***Surveys***.

**\***

reference category; L E Rural = lower Egypt rural; U Governorates = urban governments; L E urban = lower Egypt urban; U E urban = upper Egypt urban; U E rural = upper Egypt rural; and F Governorates = frontier governorates; R Catholic = Roman Catholic; OR = odds ratio; < lower level; > upper level.

Number of living children does not play a great role. The probability of using is the same for females who have one to four children and for those who have none. However, the chance of using is a bit higher (1.1 times) for females who have five children or more than for females who are childless.

Education level has no positive impact on contraceptive use. In fact, the opposite is the case. Females with a primary education have 1.3 times less chance of using contraception than females without education. Those with secondary education are 1.1 times less likely to use than those with no schooling, and women with higher education levels have 1.5 less chance of using than their counterparts who never attended school. However, the education of the females’ partner does play a positive role. Women whose partners have primary school level have 5.6 times more chance to use than those whose partner never went to school. Females with a partner having a secondary education level are 7.9 times more likely to use, and those with a partner with higher education have 12.3 times more chances to use than those with a partner who did not attend school. Therefore, it seems that, even if the schooling of females does not have any impact, the schooling of their partners has an impact on their contraceptive use. Therefore, the involvement of the partner in family planning must be taken into account in this country.

Wealth as a category does not show any positive impact on contraceptive use. Poorer females are 1.1 times less likely to use than the poorest. Females belonging to the middle and richer category, respectively, are 1.3 times less likely to use compared to the poorest and the richest females have 1.2 times less chance of using than their poorest counterparts.

When females work, they have greater chances (1.2 times greater) to use than when they do not work. Therefore, working status can play a positive role on contraceptive use. There is also noticeable difference of probability use regarding the place of residence. Urban women have 2.0 times more chance of using than rural females.

Interestingly, Christian females and those belonging to other religions are less likely to use than Muslims, but these results must be considered with caution because of the sample size of the non-Muslim population and the consequence of the high standard error (2.6) of this variable in Egypt.

However, when one looks at the region, one can see that females who live in upper Egypt rural region are less likely to use contraception (1.5 times less) than the ones living in lower Egypt rural region. The ones situated in the frontier governorates are also less likely to use, with a probability 1.4 times lower. In conclusion, contraceptive use in Egypt depends on demographic variables (age of the females and likely age at first marriage), but the rest of the socio-economic variables, contrary to what one would think, do not play a great role.

Differences can be also observed between religions. Compared to Roman Catholic adepts, Protestant females have 1.2 times less chance of using contraception, and Atheist women (no religion) have 1.4 times less chance of being a contraceptive user. Only females declaring that they belong to another cult have slightly higher chances of using than Catholics (1.2 times more chance) in Namibia.

The population in Mali is essentially Muslim (90%), but one can see that religion can play a role in contraceptive use. Indeed Christian females are 1.2 times more likely to use than Muslims, but one has to note that they only represent 1% of the population. Animists (8% of the population) have a 1.3 times higher chance of using than their Muslim counterparts, Atheists also have 1.6 more chance of using, and females belonging to other religions have 1.4 times higher chances of using contraception than Muslims. Therefore, religion has an impact on contraception use, but to increase contraceptive use by changing the religions of the females is not feasible.

On the regional level, one can observe the same trend, with females from urban regions having a higher probability of using than females from rural regions (2.2 more chance in Koulikoro, and 1.6 more chance in Bamako than in Sikasso) in Mali.

Christian and Animist females use, respectively, 1.2 times more than Muslims females. Atheists use 1.2 times less than Muslims. Hence the effect of religion exists, but to a limited extent in Niger.

This is also true at the regional level with a higher probability in the regions of Maradi (2.1 times) and Zinder (2.5 times) but, interestingly, with lower chances for females inhabiting the region on Niamey (1.5 times less chance).

**Discussion**

The highest prevalence of contraception is mainly situated in northern and southern Africa. Countries from West Africa are the ones where contraceptive use is the lowest, including one east-African country, Ethiopia. In central Africa, contraceptive use is still low but not as low as in West Africa. It is also interesting to note that the majority of the countries which have the lowest contraceptive use are French-speaking countries, while the countries considered as English-speaking are those with the highest contraceptive rate. Considering the level of non-users, the majority of non-users are concentrated in West Africa, followed by central and East Africa, and finally southern Africa and Egypt in northern Africa. The level of users does not guarantee a good coverage of the population against unwanted pregnancies. Indeed, when one looks at east Africa in particular, one can see that, even though contraceptive use is much higher than in the majority of West-African countries, the level of unmet needs is also much higher, and vice versa, despite the fact that the majority of West-African countries’ contraception use is less than 10%. Indeed, their proportion of unmet-needs is lower than the level in east Africa. The contraceptive use rate is therefore not an accurate indicator in gauging the level of females who are protected against the risk of unwanted pregnancies in a designated area.

In Egypt and Namibia, overall, socio-economic variables do not play a great role. Indeed the probability of being a user of contraception does not increase noticeably with education level, wealth status, working status or religion. In fact, when the social level increases one could see that it could even have a negative impact on the population of unmet needs. Indeed, the probability of unmet needs for contraception tends to be higher for females who have a better social status than for those who belong to the lowest layers of these societies. Interestingly, the same conclusions were made when looking at Mali and Niger, the two countries with low contraceptive use.

The education level of the partner and socio-economic variables did not have a great impact of contraception behaviours. The only variables which play a role are age and the number of living children (but to a limited extent). Therefore it is a problem for family planning programmes which can hardly find a key variable to play with to improve family planning in Africa. Age cannot be one of these variables, as it is the one variable that no programme can change. In conclusion, these results show that socio-economic variables have a much lower impact than what one would expect.

Overall, this article wanted to show that, if family planning programmes want to succeed, they have to rethink their approach. First, they should take into account that policies and programmes need to be country specific. Second, they should focus on educating at the local level – both females and males – on the benefits of a reasonably sized family. Third, they should take into account the targeted population and the resources available, and try to develop the access to traditional methods rather than focusing on imposing modern methods of contraception. Finally, they should use the correct tools of information and certainly not rely on the contraceptive use rate only.

We would like to stress that better understanding of contraceptive issues could come from better ***data*** collection tools. Indeed, contraception ***data*** are always gathered at a point of time but cross-sectional ***data*** are not sufficient to understand all the mechanisms hidden behind contraceptive behaviours. One would need longitudinal studies, with a history of contraception, which would provide the researcher with the dynamics of contraceptive use (age at first use, discontinuation and its reason, etc.). Therefore, longitudinal studies should be carried out, and a question on contraception should be included in ***census*** questionnaires.

In conclusion, Africa is a continent of contrast. There are different contraceptive behaviours, and good estimation tools are needed to develop specific family programmes to insure that, soon, all females on this continent will have the freedom and access to their fundamental right to choose their number of children.

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[***Bangladesh’s stellar growth***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5S1W-2J81-JDSH-210G-00000-00&context=1516831)

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**Length:** 1223 words

**Byline:** Rejaul Karim Byron and Md Fazlur Rahman

**Body**

Bangladesh is now one of the fastest growing economies in the world, riding on a stellar performance of the manufacturing sector and hard work of farmers and migrant workers.

Out of 58 countries with a population of at least 20 million each, only 17, including Bangladesh, China, India and Sri Lanka, achieved an average GDP growth of six per cent and more, shows the World Bank's analysis of growth performance of countries in a decade till 2014.

Intermittently hit by sundry challenges, Bangladesh rose from the ashes of a nine-month-long bloody war to become what it is today.

Its economy has been growing at more than six per cent for over a decade, with the International Monetary Fund projecting the growth to accelerate gradually to seven per cent over the medium term.

In July last year, the country graduated to a lower middle income nation from a low income one.

According to government ***statistics***, Bangladesh's per capita income now stands at $1,314. And the government aims to almost treble it to over $4,000 by 2021.

This economic success of Bangladesh has led many to predict a bright future for the country in the days to come.

MoneyGram, a US-based money transfer company, has included Bangladesh in its list of five fast-growing economies in the world.

Brooking Institutions, a US-based thinktank, said Bangladesh's economy is 34th in the world in terms of size. In the next 25 years or so, it will become 23rd, surpassing that of many European countries, Australia and Malaysia in terms of size.

“The most important driver of Bangladesh's growth has been capital accumulation in the early stage of development,” said Zahid Hussain, WB lead economist in Dhaka.

Capital accumulation, financed mostly out of national savings, enabled the expansion of production capacity in ***agriculture*** as well as industry, he said.

Prudent macroeconomic management, financial sector reforms, deregulation, trade liberalisation and inclusive social policies contributed to the creation of an environment congenial for investment.

“Although this average growth of six per cent is described by many as a trap, it put Bangladesh among the fastest growing countries in the world during 2004-14,” he said.

In December, WB Chief Economist Kaushik Basu said he is more upbeat about Bangladesh, adding that the country is on the cusp of a take-off and will become one of the new Asian Tigers.

“Now it is time for the people of Bangladesh to feel that they have the reason to be ambitious.” The progress will be more rapid if people realise that it is possible to grow faster onwards, he said.

Basu's visit coincided with the prime minister's inauguration of the construction work of Padma bridge for which the WB promised $1.2 billion in credit but later cancelled it over allegations of corruption conspiracy in the project.

He said it was unimaginable 10 years ago that Bangladesh could undertake a project of this scale. But the country now has the means and capacity to pull off such an ambitious project.

At a programme in the capital on Wednesday, Finance Minister AMA Muhith said poverty rate has fallen sharply in the country, with 130 million of 160 million people now living above the poverty line.

“This was possible because of domestic demand. It has also helped keep the pace of economic growth over six per cent despite a tumultuous global scenario,” he said.

According to planning ministry ***data***, around 25 million people graduated from the poverty line since 2000.

Rice production has trebled since 1980, from 12.3 million tonnes to 37.6 million tonnes.

The manufacturing sector, led by apparel, has been the single largest contributor to growth, with its share in GDP reaching 17 per cent last year from 13 per cent in 1981.

In 1972-73, war-torn Bangladesh's export was $348 million only. In the last fiscal year, it stood at $31.2 billion.

Exports, which account for around 20 per cent of the country's gross domestic product, rose to a record high of $3.2 billion in a single month in December last year, while other regional economies reported continued decline in exports.

"Over the medium-to-long term, we are bullish on the growth prospects of Bangladesh's industrial and export sectors," Raphael Mok, Asia analyst of BMI Research, a company of credit rating agency Fitch Group.

During the Awami League government's tenure in 1996-2001, the country's foreign reserves fell below $1 billion. But the country now has more than $27 billion in reserves, enough to meet its import bills for seven months.

Remittance sent by migrant workers stood at $15.27 billion last year, which was only $781.54 million in 1990. Remittance income grew faster after 2008-09 on the back of a significant rise in manpower exports.

According to the government's latest economic ***census***, the number of economic units doubled between 2003 and 2013, thanks to fast expanding non-farm activities across Bangladesh.

Economic units have increased 71 per cent since 1986. Though still at a low level, the number of female-headed households increased five times since 2003 to 563,000 in 2013.

Noted economist Wahiduddin Mahmud said it is clear that micro, small and medium enterprises are the main forces of the economy.

Rural families are no longer engaged in farm-based economic activities alone. More non-farm jobs have been created in rural areas compared to urban settings, he said.

Mohammed Farashuddin, former governor of the central bank, said the brighter side of the economy is that rural Bangladesh has healthy growth.

The average income of a village poor is now 10 times higher than that in 1972. “People are working. The country is full of non-farm activities,” he said.

Economist Hossain Zillur Rahman said new entrepreneurs are emerging. “Yesterday's full-time workers are opening economic units today. This is one of the pictures showing how the economy is flourishing.”

Selim Jahan, director of Human Development Report Office at the United Nations, sees vibrancy and dynamism within the country.

“Everybody is doing something. Somebody is selling fruits, somebody is selling clothes and somebody is doing something else. And that is not typical of Dhaka, that is typical of other cities as well,” said Selim.

As the country moves forward, it needs to focus on both physical and social infrastructure. “By neglecting one, sustainable growth and progress cannot be achieved.”

There is a consensus that Bangladesh can do better in terms of economic growth, given its strategic geographic location, vast young population and global connectivity.

To achieve growth rates similar to that of the East Asian stars such as China and South Korea, Bangladesh needs to work on easing the infrastructural and institutional constraints to raise private investment and efficiency of these investments, according to the WB.

Bangladeshis have never given up on their hopes despite a bitter relationship among major political parties, endemic corruption, infrastructure bottlenecks, weak institutions, fragile democracy and global slowdown.

It became evident again in January when an international ***survey*** by WIN-Gallup showed that Bangladeshis are the world's most optimistic people about their economic prospects in 2016.

In the ***survey***, 66,040 people were interviewed across 68 countries, and the field work was conducted from September to December last year.

**Source:** The Daily Star (Bangladesh)

**Graphic**

A graph shows the progress of Bangladesh economy.

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[***Are blue skies back?***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5HT1-9F71-JCF5-B2JJ-00000-00&context=1516831)

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**Section:** NEWS; No. 2236

**Length:** 2968 words

**Highlight:** Having suffered restrictions and reductions in funding under the previous government, Canada's scientists have welcomed the Trudeau administration. But will it live up to their high expectations? Ellie Bothwell investigates

**Body**

Six months ago, one of Canada's leading neuroscientists, Robert Brownstone, announced his resignation as director of research in neurosurgery at Dalhousie University, Nova Scotia, citing the Canadian government's "worrisome" cuts to science funding and its shift towards applied research.

Three months into his new post as chair of neurosurgery at University College London, Brownstone is keen to point out that he also was "pulled" out of Canada by UCL's "huge strength in neuroscience". But he reiterates his relief at being able to leave behind "some of the depressing things that were happening" under Canada's recently departed Conservative government, led by Stephen Harper.

"The previous government was not particularly interested in knowledge," Brownstone says. "They would use policy to make knowledge rather than use knowledge to make policy. That was their attitude. What worried me was not so much [how it might impact on] anyone at my stage in their career, but [how it would affect] the young generation, who would be discouraged from pursuing a life in research."

Brownstone's views were widely shared by Canadian scientists. Indeed, such was the scale of their discontent that science policy even became an issue in the campaign leading up to last October's federal election. And the Liberal Party of Canada's pledges to redress the situation are considered to be one factor in its landslide victory, in which it won 184 seats, against the Conservatives' 99.

Not all scientists were critical of Harper's government. In 2008, physicist Neil Turok took the opposite journey to Brownstone, leaving the University of Cambridge - where he had worked alongside Stephen Hawking for 11 years - to become director of the Perimeter Institute for Theoretical Physics in Ontario. He said at the time that the "underfunding and deprioritisation of basic science made the UK a difficult environment to work in". And he stands by his decision, describing Canada as "an amazingly supportive environment for great science".

"I feel incredibly lucky to have had the opportunity to help create [what Hawking has described as] 'one of the leading centres in the world in theoretical physics, if not the leading centre'. This would certainly have been impossible in the UK," Turok says.

But many other scientists in Canada are immensely relieved that the Harper era is over. A common bone of contention was the Harper government's moves to put a greater emphasis on commercialisation of research. According to Jim Woodgett, director of research at the Lunenfeld-Tanenbaum Research Institute at Toronto's Mount Sinai Hospital (which is affiliated to the University of Toronto), that aspiration was "clearly being enacted in terms of the types of funding programmes they wanted, the creation of a number of commercialisation centres and [the placing of] a lot more emphasis on research that would lead to product development. It was all really at the expense of a lot of basic science."

Another gripe was the funding cuts of nearly 8 per cent imposed on Canada's three research councils, known collectively as the Tri-Council Agencies, between 2007 (the year after the Conservatives came to power) and 2016. And, perhaps most prominently, critics railed against what Woodgett calls the Conservatives' "command and control" mentality, which required government scientists to apply for permission before speaking to the press.

"Even the [science] ministers' opinions were not particularly well respected by the prime minister's office," Woodgett claims.

In July 2012, this "toxic broth" led to a protest on the streets of Ottawa against the government's alleged anti-science agenda. Dressed in white lab coats and holding placards reading "no science, no evidence, no truth, no democracy", the protesters held a mock funeral on Parliament Hill to mourn the "death of evidence" in government.

Two years later, the US-based Union of Concerned Scientists, along with the Professional Institute of the Public Service of Canada, published an open letter urging Harper to abolish the protocol on speaking to the media. The letter included more than 800 signatures from academics in 32 countries. It also referenced a ***survey*** conducted by the institute in 2013, which found that 90 per cent of more than 4,000 federal scientists felt that they could not speak freely about their work.

Michael Halpern, manager of strategy and innovation for the Center for Science and Democracy at the UCS, says it also became very difficult for federal researchers to attend scientific meetings and conferences.

"Travel requests often had to be made up to a year in advance and were only approved days before the conference, if they were approved at all, which was far too late to be able to submit abstracts or present research or sometimes even get a reasonably priced plane ticket," he says. "Scientists who were trying to stay current in their field, to be able to effectively do their jobs and inform government policymaking, were finding themselves left out of those collaborative spaces."

Critics were also incandescent about rules imposed by the Department of Fisheries and Oceans reportedly requiring scientific papers written by its researchers to be scrutinised by officials for any "impacts" on departmental policy before they could be published. According to David Robinson, executive director of the Canadian Association of University Teachers, such measures "created some significant ***data*** flow problems" for university academics who rely on government ***data***, such as those working in ***agriculture***, environment and climate change.

The Conservative Party of Canada did not respond to an invitation to respond to criticisms of its science policies.

On 4 November, his first day as prime minister, Justin Trudeau restored the minister of science to a Cabinet-level position and gave the job to Kirsty Duncan, adjunct professor of medical geography at the University of Toronto. Her "overarching goal", she says, "will be to support scientific research and the integration of scientific considerations in our investment and policy choices". She has been criticised in the media for allegedly promoting an unproven medical treatment for multiple sclerosis, but she insists that her "experience and commitment to science speak for themselves. I have also been and will continue to be an advocate for evidence-based science."

Meanwhile, the role of minister of the environment was rebranded minister of environment and climate change, reflecting the greater concern about global warming in the new government compared with its predecessor. And a new position of minister of innovation, science and economic development was created, tasked with - as Duncan puts it - "driving the economy" by "working with provinces, territories, municipalities, employers and labour to improve the quality and impact of our programmes that support innovation, scientific research and entrepreneurship".

The appointee to that role, financial analyst Navdeep Bains, immediately announced that the government would reinstate the mandatory long-form ***census***, which was scrapped by the Conservatives five years ago - a move lobbied for by academics, who argued that the ***census*** provided ***data*** that were crucial for university research and government policy. Bains also pledged that "government scientists and experts will be able to speak freely about their work to the media and the public".

"Openness and transparency in communicating federal science is one of my top priorities," Duncan says. She also aims to "increase recognition and support for fundamental research" and to fulfil the Liberals' election pledge to re-establish the role of chief science adviser, which was scrapped seven years ago.

While science funding is a federal matter in Canada, responsibility for higher education lies largely with its 10 provinces. Nevertheless, the Liberal Party has also made several commitments to help to widen access to higher education. These include increasing the value of state-funded bursaries, known as Canada Student Grants, by 50 per cent to C$3,000 (£1,470) a year and increasing the earnings threshold above which graduates must start repaying student loans to C$25,000 a year. It has also pledged to invest C$50 million in additional annual support to the Post-Secondary Student Support Program, which provides additional financial assistance to indigenous students. This is all part of Trudeau's long-standing goal to see the proportion of Canadians with post-secondary education qualifications rise to 70 per cent, from the current rate of just over 50 per cent.

The new prime minister has also made a commitment to expand the number of positions under the Canada Summer Jobs programme, which provides funding to help employers create summer work opportunities for students, and to invest C$40 million each year to help employers create more work placements for students in science, technology, engineering, mathematics and business programmes.

The CAUT's Robinson would like to see more transparency around how the money allocated to the provinces for post-secondary education is spent - to ensure that it is not redirected to other spending priorities. He adds that one of the "fallouts" of higher education's being a provincial responsibility is that there is "real inconsistency" in policy across the country. For example, annual tuition fees in Ontario averaged C$7,539 in 2014-15, but this dropped to C$2,743 over the border in Québec, according to ***Statistics*** Canada.

Robinson suggests that Trudeau could negotiate national standards for higher education in the same way as is done for standards in healthcare. "There's a general sense of malaise within the university and college sector right now, where people are feeling like they can't take any more cuts. There needs to be some federal leadership in recognising that the provinces, in many cases, simply don't have the fiscal capacity to adequately fund the higher education system that we deserve."

Michael Bloom, head of the Centre for Skills and Post-Secondary Education at research organisation the Conference Board of Canada, adds that another issue that has arisen from the provincial system is the lack of official recognition of credentials earned in particular Canadian provinces, by both other provinces and other countries.

"We've got a study coming out shortly which shows that the annual cost to Canada of non-recognition of credentials...is between C$13.4 billion and C$17 billion, in GDP and forgone earnings. That comes from people either unemployed or underemployed because their credentials aren't recognised," he explains.

However, Bloom says it is "positive" that the Liberals have expressed an interest in more federal-provincial dialogue, which he hopes will speed up the harmonisation of policy.

"Compared with 15 years ago, we have seen some progress, but it's still in many ways easier to move north-south [to the US] than east-west. Until we get really good mechanisms to collaborate across the country, we're not going to have the best possible education system."

One of Trudeau's main challenges as prime minister will be managing expectations and handling the demands to act instantly on election pledges.

Robinson is hopeful that the reinstatement of the long-form ***census*** is "part of a trend towards rebuilding some of the intellectual and scientific infrastructure that has been dismantled over the past 10 years". But he acknowledges that there is still "a long way to go". "There were a number of really important social ***surveys*** that were eliminated over the years because of programme cuts, and we're hoping that there will be some reinvestment there," he says.

"You have to make progress but you also have to recognise that repairing some of the damage that was done, particularly in our sector, is going to take time. I'm not sure if our folks are that patient. There's a lot of pent-up frustration about the past 10 years that's now coming to the fore."

Margrit Eichler, faculty member of sociology and equity studies in education at Toronto, is also wary of being too optimistic. As president of campaign group Our Right to Know, launched during the Conservative government to fight for open access to research results, she has drafted a "huge list" of policies that she would like the new government to implement, which include a guarantee that it will not alter or ignore scientific research for political reasons; a requirement for all research funded by public money to be published; and the placing of more academics, as opposed to industry professionals, in charge of the research councils.

"We want to make sure the councils get their funding increase, that more money is directed to basic research and that the oversight is, in the majority, done by academics. The temptation not to [introduce these policies] will be very strong, as these things cost money, so we need to have a really strong civil society movement to say: 'We continue to be interested in this and we continue to watch what you are doing,'" Eichler says.

UCS' Halpern adds that the new government is likely to act first on the pledges "that give them the most political capital and give them the most attention. So the question is will science continue to be a top priority? It's much easier to fight for transparency and openness when you're a candidate than when you're an elected official. So when [a government laboratory] comes out with a finding that is in conflict with the Trudeau government's policy or priorities, scientists will need to speak up just as loudly [as before] to make sure that that [finding] sees the light of day."

Woodgett believes that a lot of the optimism about the new government derives from the record of the previous Liberal government, which was in power from 1993 to 2006 and "invested a lot in science and created a number of new science funding programmes". But he notes that Trudeau "didn't really make any specific promises" about science funding, and says that one early indication of the depth of the new government's commitment to science will be whether it supports the Canada First Research Excellence Fund, launched in 2014 by the Conservatives to pump C$1.5 billion into Canadian research at top universities over the next 10 years.

"The honeymoon period is not going to be very long," Woodgett concludes. "A lot of people voted because they wanted anybody but the previous government. It's great to be elected on that wave of enthusiasm, but then the expectations are very high and they are inheriting a bunch of problems. I think that in higher education we're going to have to wait and see." l

Timeline of the Harper government's 'War on Science'

February 2006

Stephen Harper becomes Canada's 22nd prime minister.

January 2008

The department of the environment, known as Environment Canada, orders its scientists to obtain permission from the government before speaking to journalists. Other departments follow suit. The Montreal Gazette later reveals details of a leaked internal document from the department, which shows that the policy reduced its engagement with the media on climate change by 80 per cent.

March 2008

The position of national science adviser to the prime minister is eliminated.

June 2010

The government announces that the formerly mandatory long-form ***census*** will become voluntary in 2011.

August 2011

Environment Canada cuts 700 jobs - 11 per cent of its workforce - because of a lack of federal funding.

March 2012

The Canadian Foundation for Climate and Atmospheric Studies, the country's main funding body for university-based research in this area, closes after the government ceases to provide funding.

April 2012

The government sends media chaperones to shadow Environment Canada scientists at the International Polar Year Conference in Montreal.

The Polar Environment Atmosphere Research Laboratory in Nunavut announces that it will cease full-time operation because of a lack of funding. However, this decision is reversed in May 2013.

June 2012

The government cuts the Department of Fisheries and Oceans' funding for freshwater research. The department eliminates the Experimental Lakes Area - a freshwater research centre in Ontario staffed by government scientists. The facility is later managed and operated by the International Institute for Sustainable Development, following a national and international outcry.

July 2012

Canadian scientists rally on Parliament Hill in Ottawa for a mock funeral, mourning the "death of evidence" in government. Their main slogan is: "No science, no evidence, no truth, no democracy."

February 2013

The Department of Fisheries and Oceans introduces a policy that characterises all department research as confidential until it has been reviewed "for any concerns/impacts to DFO policy", according to the Times Colonist.

March 2013

Canada's Information Commissioner launches an investigation into the "muzzling" of scientists, following a joint complaint from the University of Victoria's Environmental Law Centre and the advocacy group Democracy Watch.

May 2013

Canada's National Research Council launches a new "business approach", intended to shorten the gap between early stage research and commercialisation.

January 2014

The Department of Fisheries and Oceans closes more than a dozen federal science libraries. Images of dumpsters full of scientific journals and books go viral.

October 2014

The US-based Union of Concerned Scientists and the Professional Institute of the Public Service of Canada write an open letter to Harper, urging him to allow federal researchers to speak freely with journalists.

November 2015

Justin Trudeau becomes Canada's 23rd prime minister after a landslide election victory for the Liberal Party.

Time line of the Harper government's "War on Science"

Tuition fees in Canada by province

**Load-Date:** January 7, 2016

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[***Are Chinese workers compensated for occupational risk?***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:6BM3-69X1-DY41-74FK-00000-00&context=1516831)

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Zhiming Cheng

Russell Smyth

**Body**

**ABSTRACT**

This study contributes to an important, but under-researched, topic on China by empirically examining the theory of compensating wage differentials for occupational risks in urban labour markets. Drawing on two datasets – one national for all workers and one from the Pearl River Delta for migrant workers – we examine the relationship between wages and occupational risks, and estimate the risk premium for health hazards. The results show that having risky jobs, especially those associated with dust, has a significant negative effect on hourly wages. The negative risk premium accounts for approximately 10% of all workers' hourly wage in safe jobs using the national dataset and 1.8% of migrant workers' hourly wage in safe jobs in the Pearl River Delta. With the national ***data***, males, migrant workers and manual workers incur a wage penalty for exposure to dust, chemical substances, biological hazards and other health hazards. Only urban locals earn a significantly positive wage premium for exposure to chemical substances. We offer several explanations for the negative wage premium in the context of China's urban labour market.

**FULL TEXT**

**Introduction**

Since the introduction of market reforms, China has incrementally introduced a more flexible wage structure and adopted a more decentralized approach to developing a labour relations framework (Friedman and Kuruvilla, 2015). A feature of the Chinese urban labour market is considerable wage segmentation between the state-owned and non-state-owned sectors and between those with and without an urban household registration (*hukou*) (Knight and Yueh, 2009).1 In the non-state sector in particular, in which rural–urban migrant workers without an urban *hukou*, and other low-skilled workers are concentrated, the working conditions are often poor and the occupational risks are high. One estimate is that about 30% of the Chinese industrial workforce are engaged in hazardous occupations (Chen and Chan, 2004). Chinese trade unions have the power to monitor occupational health and safety (OHS) issues in enterprises. There is some evidence that Chinese unions have improved OHS standards in state-owned enterprises and state-owned joint ventures (Chen and Chan, 2004), but the worst conditions are in the non-state sector in which there are no trade unions or trade union representation is formalistic (Liu and Li, 2014). In the 1990s, the Chinese urban labour market was characterized by labour surplus; however, since the mid-2000s labour shortages have emerged (Friedman and Kuruvilla, 2015).

The increased bargaining power of workers, due to the labour shortage, raises the question of the extent to which workers are compensated for working in hazardous or poor conditions. The theory of compensating wage differentials (CWD) suggests that job characteristics, such as work environment and workplace safety, can be determinants of labour market outcomes and wage dispersion (Rosen, 1974). In theory, wage premiums are paid to compensate employees who work in undesirable conditions in terms of health and safety risk (Thaler and Rosen, 1976). Positive compensating wages act as a reward to ‘compensate’ workers in arduous or dangerous jobs. On the one hand, if Chinese urban workers have more outside options, as suggested by the existence of labour shortage, if they are not being compensated for hazardous working conditions, in a competitive labour market presumably they will change jobs. On the other hand, however, the fact that these workers have low human capital and market segmentation may mean that workers in hazardous jobs have few options in those segments of the labour market in which occupational risks are lower.

The objective of this study is to test the theory of CWD in the context of China's urban labour market and estimate the wage premium for undertaking hazardous jobs. To do so, we draw on two datasets. The first is a ***survey*** collected in 2008 containing information on rural–urban migrants in the Pearl River Delta in Guangdong province (hereafter referred to as the PRDS). The second is the 2012 China Labour Force Dynamics ***Survey*** containing information on rural–urban migrant and urban workers from provinces in east, central and western China (hereafter referred to as the CLDS). A number of studies on the compensating wage for occupational risk exist for developed economies (Smith, 1983; Viscusi, 1993; Viscusi and Aldy, 2003). There is, however, little research for developing countries and, in particular, China (Guo and Hammitt, 2009; Qin et al., 2013; Scheffel, 2014). The Chinese studies ignore the heterogeneity in actual risk experienced by individual workers and do not address the potential endogeneity of occupational risk and potential issues of omitted variable bias. Nor do they consider the effect of specific occupational hazards on workers' wages. We extend the literature applying CWD theory to China in the following ways. The first is that we employ several econometric methods to address potential omitted variables bias and endogeneity problems associated with estimating the CWD for job risk. The second is that the CLDS allows us to examine the effect of specific occupational hazards on workers' wages. The third is that we examine how the CWD for job risk varies for different subsamples of workers across the wage distribution. Finally, using multiple datasets provides the findings with additional robustness.

**Existing literature**

Prior studies on occupational risks and employee compensation are mainly based on the theory of CWD and the model of hedonic prices. The theory provides an analytical framework through which to examine labour market differentials derived from the interaction between workplace health and safety and workers' compensation. The theory assumes that wage premiums are paid to compensate employees working in undesirable conditions with higher health and safety risks than others (Rosen, 1974). CWDs are the prices at which good working conditions are bought from, or bad working conditions sold to, workers who take on less desirable jobs. The theory explains the wage differentials between workers by considering non-wage components associated with different types of jobs. In a perfectly competitive labour market conceptualized by neoclassical economics, workers are compensated by wage premiums for undertaking undesirable working conditions with higher occupational risks, after controlling for factors affecting productivity and wages (Brown, 1980).

Some studies have examined the trade-off between occupational risks and personal economic returns in developed countries (Kniesner and Leeth, 1991; Marin and Psacharopoulos, 1982; Miller et al., 1997). Earlier studies find a positive, and statistically significant, relationship between work-related (fatal or nonfatal) risks and wages (Dorsey and Walzer, 1983; Moore and Viscusi, 1990; Thaler and Rosen, 1976). More recent studies focusing on Asia also find a positive relationship between risk and wages (Kim and Fishback, 1999; Liu et al., 1997; Siebert and Wei, 1998). However, other studies find an insignificant, or even negative, relationship between occupational risk and wages (Dorsey, 1983; Leigh, 1991; Moore and Viscusi, 1988).

Some studies have examined how trade union membership affects the trade-off between occupational risk and wages (Arabsheibani and Marin, 2000; Dorman and Hagstrom, 1998; Gegax et al., 1991, Meng and Smith, 1990). The rationale for these studies is that firms with a union presence may have different processes for mediating workplace risk compared with those firms without such a presence, or that unions might have fuller information about risks and be better placed to negotiate compensating differentials. These studies have also generated conflicting results. There is no clear evidence from North America or the United Kingdom that union members receive higher risk premiums than non-union members.

Mixed empirical findings have led some to question the theoretical assumptions underpinning the theory of CWDs. The first assumption is that there is a perfectly competitive labour market, in which wages are determined by labour supply and demand and workers are mobile. In reality, however, workers – especially those with low human capital – may not have complete freedom to change jobs. For example, in periods of high unemployment workers will be less mobile even if their jobs are dangerous. Supporting this conjecture, one study found that there was no significant difference in labour turnover between risky and safe jobs in the United States during periods of economic recession (Robinson, 1991).

Second, workers may not be able to obtain full information in relation to occupational risk. The original theory assumes that workers are fully informed about the nature of the job or that they can find out about the hazards of a ‘bad’ job by word of mouth or soon after joining. If the hazard, however, is obscure and carries medium- or long-term impacts on health, workers may not receive any wage compensation. In the absence of an effective mechanism which presses employers to fully reveal OHS information, employers have economic incentives to understate, or hide, such information, or even mislead employees in pursuit of profits (Hopkins, 1995).

Third, people are not invariably rational decision-makers as assumed by neoclassical theory. Instead, people have a propensity to overestimate probability of positive events and, at the same time, underestimate the probability of negative, or low probability, events (Akerlof and Dickens, 1982). Traumatic deaths from work-related causes are relatively rare. Hence, workers may believe that ‘it cannot happen to me’, meaning that cognitive dissonance results in the underestimation of work-related risks and a disinclination to seek safer alternative employment.

***Data* and method**

**Dataset 1: Pearl River Delta *Survey***

The first dataset used in this study was collected in 2008 by the School of Sociology and Anthropology at Sun Yat-Sen University, Guangzhou, China as part of a research project entitled Rural Migrant Workers in Cities of the Pearl River Delta. The ***data*** collection followed a proportional sampling framework that distributed the sample across nine cities, according to the actual gender, industrial and regional distribution of migrant workers obtained from the results of provincial population ***census***' conducted by the Chinese government. In order to maintain representativeness, no more than three responses were selected from each enterprise. Altogether, 2505 valid responses were received that contained information related to occupational risk, of which 1832 workers (73.1%) were engaged in safe jobs, while 673 workers (26.9%) were engaged in risky jobs in poisonous and harmful work environments.2 Other information collected pertained to earnings, employment status, employee benefits, and personal and family characteristics. The PRDS has advantages and disadvantages for our purposes. The main advantage is that it focuses on rural–urban migrant workers, who are disproportionally represented in hazardous jobs, and was administered in a major migrant-receiving area. The disadvantage is that it does not contain ***data*** on urban workers or specific types of risks.

**Dataset 2: China Labour Force Dynamics *Survey***

The second dataset used in this article is from the 2012 CLDS, collected by the Center for Social Science ***Surveys*** at Sun Yat-Sen University. The ***survey*** adopted multistage cluster, stratified and probability proportional to size sampling methods. Considering the differences in socioeconomic development and the sizes of the population and labour force between east, central and west China, six sample frames were designed in this ***survey***, including large and small population provinces in the east, central and west regions separately. In addition, another two sample frames, the Pearl River Delta region and non-Pearl River Delta region, were designed to increase the representativeness of Guangdong province. All adults in each household were interviewed with the aid of questionnaires to collect individual and household ***data***.

In total, 16,253 valid responses were received, of which 5721 respondents answered six occupational hazard questions on whether they had been exposed to toxic/harmful dust, radioactive substances, harmful/caustic chemical substances, physical hazards, biological hazards and/or other occupational hazards. Among them, 4422 workers (77.29%) were engaged in safe jobs (without any of the six types of hazards), while 1299 workers (22.71%) were engaged in risky jobs (one or more hazards). The main job hazards to which workers were exposed were dust and physical hazards (802 and 557 workers, respectively), following by chemical substances and radioactive substances (352 and 207 workers, respectively). Only 56 workers were exposed to biological hazards and 17 workers exposed to other hazards. The main advantage of the CLDS for our purposes is that it contains ***data*** on migrant and urban workers, distinguishes between six different types of risky jobs and is a nationally representative ***survey*** of urban China across all regions.

**Econometric method**

To examine the extent to which the CWD contributes to wage inequality between workers in safe and risky jobs, we estimate the following hedonic wage model: (1)lnWi=α+β1Riski+β2Pi+β3Wi+β4Ri+μi

Here, ln*W* is the natural logarithm of the hourly wage for the *i*th person and *Risk* is the core independent variable for occupational risk. To measure the risk variable we use employees' perception of risk. *Risk* = 1, if respondents reported that their job was not safe (PRDS) or that they had been exposed to specific hazards in their work (CLDS), otherwise *Risk* = 0. *P* is a vector of personal characteristics; *W* is a vector of employment characteristics. We include industries and occupations to capture inter-industry and inter-occupation wage differentials. *R* is a vector of dummy variables for the economic tier of cities classified by the government (for the PRDS only), or for cities located in the east, central and west of China, which is included to control for unobserved heterogeneity in different regions (for CLDS only).

The ideal measure of fatal and non-fatal occupational risks should reflect the perceptions of both employees and employers (Viscusi and Aldy, 2003). To measure risk we use employees' perception of risk. This implies, but does not directly measure, hidden long-term risk, which is also a limitation of previous studies. Nevertheless, it is a better measure of risk than official industry ***data*** on industry fatalities, especially given the well-known problems of reliability of such official ***data*** in China. Our measure of risk means that the analysis is based on current risks perceived by workers. While we do not have ***data*** on employers' perception of risk, it is reasonable to conclude that employers must know these risks as well.3

We first estimate equation (1) using ordinary least squares (OLS). Using OLS assumes that occupational risk is exogenous. However, Viscusi (1980) argues that occupational risk may be correlated with workers' income through the wealth effect. Since there is no valid instrument in either dataset for job risk, to address the endogeneity of occupational risk and unobserved heterogeneity related to selection of risky jobs, we employ alternatively propensity score matching (PSM), the synthetic instrumental variable (IV) method proposed by Lewbel (2012) and, for the CLDS, Garen's (1988) modified selection-bias correction technique, in order to examine the robustness of the main findings. When employing Garen's procedure, we follow a similar strategy, and use similar variables, to Garen (1988), such as number of children, non-labour income, the ownership status of the respondent's house and whether the respondent had a health examination before undertaking his/her job, to instrument for the choice of risky jobs. Unobserved worker characteristics could enhance workers' productivity and reduce risk incurred in dangerous jobs. We use the education of the worker's father as a proxy to mitigate omitted variable bias due to unobserved individual ability, based on the assumption that the children of better educated parents have relatively more ability (Rubinstein and Tsiddon, 2004).

We use the Firpo et al. (2007) decomposition (hereafter, FFL decomposition) to examine the *sources* of wage distribution differentials. FFL decomposition extends the Oaxaca–Blinder decomposition to any distributional ***statistics*** of interest and allows for a more flexible wage-setting model than the Oaxaca–Blinder method.

The Oaxaca–Blinder decomposition method can be expressed as follows: (2)ΔlnWij=Q(lnWi)-Q(lnWj)=[Q(lnWi)-Q(lnWi-j)]+[Q(lnWi-j)-Q(lnWj)] where ΔlnWij represents the hourly wage differentials between workers in risky jobs *i* and safe jobs *j* and Q(lnWi-j) is the counterfactual hourly wage distribution; that is, the conditional hourly wage distribution of workers in safe jobs if they have the same marginal return on various skills as those in risky jobs. The first term on the right-hand side is the explainable component of the hourly wage gap attributable to the group difference in productivity characteristics, and the second term is the unexplainable component of the hourly wage gap attributable to the group difference in the returns to productivity characteristics. The unexplainable component of the hourly wage gap is attributed to the CWDs or risk premium.

**Results**

**PRDS results**

Table 1 presents descriptive ***statistics*** on workers' hourly wage according to whether the individual works in a risky or safe job. For workers in risky jobs the hourly wage was 4.75 RMB, which was statistically lower than the corresponding amount for workers in safe jobs, which was 5.28 RMB per hour. Table 2 shows the results from the OLS regression, in which migrant workers' hourly wage is the dependent variable. The results indicate that, on average, migrant workers who undertake risky jobs earn 3.36% less than those undertaking safe jobs. The trade union member variable is insignificant. The interaction term of the trade union member variable and risky job variable is also insignificant (results not reported). We present estimates using the Lewbel (2012) IV and PSM methods in Table 3. The Lewbel (2012) method suggests that those doing risky jobs earn 11.23% less in hourly wages than those in safe jobs. The findings from PSM, reported in Panel B of Table 4, suggest that migrants in risky jobs earn between 4 and 8.5% less than those in safe jobs. Table 1.Summary ***statistics*** for the hourly wage (RMB), 2008 PRDS.

|  | **Safe jobs** | **Risky jobs** | **t-test (p-value)** |  |  |
| --- | --- | --- | --- | --- | --- |
| Mean | 5.28 | (3.74) | 4.75 | (3.35) | 0.0000 |

*Note*: Standard deviation in parenthesis.On 30 June 2008, 1 AUD = 6.6575 RMB.Table 2.Determinants of hourly wage (RMB), 2008 PRDS.

|  |  |  |
| --- | --- | --- |
| Risky job | −0.0336\*\* | (−3.04) |
| Trade union member | 0.0667 | (1.10) |
| Other variables | Yes |  |
| N | 2094 |  |
| Adjusted R2 | 0.392 |  |

*Notes*: *t*-***statistics*** in parenthesis.\**p* < 0.1; \*\**p* < 0.05; \*\*\**p* < 0.01.All regressions contain a full set of controls; full results are available from the authors.Table 3.Robustness checks, 2008 PRDS.

|  |  |  |
| --- | --- | --- |
| Panel A: Lewbel (2012) approach |  |  |
| Risky job | −0.1123\*\* | (−1.96) |
| Other variables | Yes |  |
| N | 2098 |  |
| Adjusted R2 | 0.386 |  |
| Panel B: Propensity score matching |  |  |
| Nearest neighbour matching | −0.085\*\* | (−2.23) |
| Kernel matching | −0.040\*\* | (−2.15) |
| Stratification matching | −0.040\* | (−1.67) |
| N | 2098 |  |

*Notes*: See notes to Table 2.Table 4.Decomposition of compensating wage differentials, 2008 PRDS.

|  | **O-B decomposition** | **FFL decomposition** |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Mean** | **Quantiles** |  |  |  |  |  |  |  |  |
|  | **0.1** | **0.2** | **0.3** | **0.4** | **0.5** | **0.6** | **0.7** | **0.8** | **0.9** |  |
| Risky jobs | 1.80 | 1.27 | 1.42 | 1.55 | 1.64 | 1.75 | 1.86 | 2.00 | 2.17 | 2.41 |
| Safe jobs | 1.81 | 1.22 | 1.41 | 1.53 | 1.63 | 1.78 | 1.89 | 2.02 | 2.19 | 2.45 |
| Raw differentials | −0.01 | 0.05 | 0.01 | 0.02 | 0.01 | −0.03 | −0.04 | −0.01 | −0.02 | −0.04 |
| Explained part | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.01 | 0.00 | −0.03 |
| Unexplained part | −0.03 | 0.03 | −0.02 | −0.01 | −0.02 | −0.06 | −0.07 | −0.02 | −0.02 | −0.02 |

Table 4 presents the Oaxaca–Blinder and FFL decomposition results of mean hourly wage differentials and distributional differentials between risky and safe jobs. The results show that migrant workers in safe jobs, rather than those in risky jobs, are compensated by a wage premium, consistent with the findings from the regression results as shown above. The Oaxaca–Blinder decomposition results show that the mean log hourly wage gap between workers in risky and safe jobs is −0.01, of which −0.03 can be attributed to the negative wage premium. This represents almost three times the raw hourly wage differentials, accounting for 1.81% of the hourly wage of migrant workers in safe jobs. The quantile-based FFL decomposition shows the risk premium across the distribution of hourly wages. The results suggest that workers in risky jobs suffer discrimination in the form of negative wage premiums at almost all wage levels. The unexplained hourly wage gap ranges from −0.01 to −0.07, denoting 0.65–3.7% of migrant workers' hourly wage in safe jobs.

**CLDS results**

Table 5 presents the hourly wage for the full sample (Panel A) and subsamples (Panel B) for safe jobs and specific types of risky jobs. For the full sample, the average hourly wage for workers in risky jobs is 17.64 RMB, which is lower than the corresponding amount for workers in safe jobs (20.16 RMB). Similarly, for the subsamples, the average hourly wage for workers undertaking risky jobs is consistently lower than that of those undertaking safe jobs, which is consistent with the pattern in the full sample. The *t*-test results suggest that significant wage differentials exist in the full sample and for males, migrants and manual workers. Table 5.Summary ***statistics*** for the hourly wage from full sample and across groups, 2012 CLDS.

| **Panel A: Hourly wage for full sample** |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Safe job** | **Risky job** |  |  |  |  |  |  |
|  |  | **Overall** | **Dust** | **Radioactive** | **Chemical** | **Physical** | **Biological** | **Other** |
| Mean | 20.16 | 17.64 | 16.84 | 18.56 | 18.23 | 17.31 | 16.37 | 9.89 |
|  | (24.17) | (18.96) | (17.32) | (14.89) | (24.57) | (17.76) | (13.72) | (5.66) |
| t-test (p-value) | 0.0031 (between workers in safe and risk jobs) |  |  |  |  |  |  |  |

| **Panel B: Hourly wage across groups** |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Safe jobs** | **Risky jobs** |  |  |  |
|  | **Mean** |  | **Mean** |  | **t-test (p-value)** |
| Male | 23.47 | (25.05) | 18.69 | (19.82) | 0.0000 |
| Female | 17.05 | (22.90) | 15.83 | (17.28) | 0.3333 |
| Urban workers | 21.03 | (23.33) | 19.68 | (20.94) | 0.2082 |
| Migrant workers | 18.30 | (25.80) | 14.32 | (14.66) | 0.0043 |
| Manual workers | 13.71 | (13.20) | 11.55 | (10.07) | 0.0872 |

*Notes*: Standard deviation in parenthesis.On 30 June 2012, 1 AUD = 6.4959 RMB.

We now examine the manner in which general job risks affect workers' hourly wage. Results from the full specifications in column 4 of Table 6 indicate that holding other factors constant, on average, workers who undertake risky jobs earn 14.2% less in hourly wages than their counterparts who are undertaking safe jobs. Trade union members earn 10.6% more than non-members, but the interaction of the risk and trade union variables is insignificant. Thus far, we do not consider heterogeneity in general job risk among workers. Next, we examine the effects of general and specific risks on the hourly wage of the full sample as well as subsamples based on gender, *hukou* status and occupation in Table 7. For the full sample, we only find a significant negative effect of dust on the hourly wage, while the effects of other job risks are not significant. In terms of subsamples, having a risky job has a significant negative effect on the hourly wage of males, migrants and manual workers, while the effects on the hourly wage of females and urban locals are not significant. Table 6.Determinants of hourly wage, full sample 2012 CLDS.

|  | **(1)** |  | **(2)** |  | **(3)** |  | **(4)** |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| General risk | −0.0621\* | (−1.96) | −0.0947\*\*\* | (−2.90) | −0.0950\*\*\* | (−2.94) | −0.1423\*\*\* | (−2.95) |
| Trade union member |  |  | 0.1259\*\*\* | (3.61) | 0.1351\*\*\* | (3.91) | 0.1062\*\*\* | (2.60) |
| General risk × trade union member |  |  |  |  |  |  | 0.0818 | (1.32) |
| Personal characteristics | Yes |  | Yes |  | Yes |  | Yes |  |
| Employment characteristics | No |  | Yes |  | Yes |  | Yes |  |
| Regional dummies | No |  | No |  | Yes |  | Yes |  |
| N | 2738 |  | 2381 |  | 2381 |  | 2381 |  |
| Adjusted R2 | 0.196 |  | 0.249 |  | 0.264 |  | 0.265 |  |

*Notes*: See notes to Table 2.Table 7.Determinants of hourly wage, by groups and types of risk, 2012 CLDS.

|  | **Full sample** | **Male** | **Female** | **Locals** | **Migrants** | **Manual workers** |
| --- | --- | --- | --- | --- | --- | --- |
| General risk |  | −0.1325\*\*\* | −0.0501 | −0.0502 | −0.2050\*\*\* | −0.2561\*\*\* |
|  |  | (−3.10) | (−0.99) | (−1.33) | (−3.32) | (−3.01) |
| Dust | −0.0750\*\* | −0.0867\* | −0.0619 | −0.0810\*\* | −0.0840\*\* | −0.2031\*\* |
|  | (−1.97) | (−1.84) | (−1.22) | (−1.96) | (−2.05) | (−2.41) |
| Radioactive substances | 0.0278 | 0.0456 | 0.0027 | 0.0502 | −0.0662 | −0.0615 |
|  | (0.46) | (0.66) | (0.03) | (0.80) | (−0.61) | (−0.43) |
| Chemical substances | −0.0572 | −0.0458\* | −0.0972 | 0.0036\* | −0.0934\* | −0.1512\* |
|  | (−1.11) | (−1.69) | (−1.36) | (1.71) | (−1.69) | (−1.75) |
| Physical hazards | −0.0366 | −0.0277 | −0.0619 | −0.0171 | −0.0609 | 0.0075 |
|  | (−0.82) | (−0.54) | (−0.79) | (−0.30) | (−0.94) | (0.08) |
| Biological hazards | −0.0751 | −0.2286\*\*\* | 0.1209 | −0.0149 | −0.3236\*\* | 0.0521 |
|  | (−0.64) | (−2.59) | (0.69) | (−0.13) | (−2.11) | (0.40) |
| Other hazards | −0.6248 | −0.6781\*\*\* |  | −0.7324 | −0.5855\*\*\* | −0.4372\*\* |
|  | (−1.23) | (−6.55) |  | (−0.97) | (−3.61) | (−2.06) |

*Notes*: See notes to Table 2.Results for general job risk and specific risks are obtained separately.

In Table 8 we report the results of several tests to ensure the robustness of our results. First, the general job risk measured as a binary variable in the basic regression is replaced by the risk level of occupations measured as an ordinal variable. In addition to information on job risks, the CLDS ***survey*** also collected information on severity of industrial injury, which was assessed on a five-point scale by asking respondents the severity of their industrial injuries (1 = resulting in disability, 2 = staying in hospital for more than 10 days, 3 = staying in hospital for less than 10 days, 4 = simple treatment or having one day off, 5 = having no industrial injury). We use the degree of industrial injury by specific risks to proxy for the risk level. The results indicate that the risk level of chemical substances is the highest (4.84), followed by biological hazards, dust, radioactive substances, physical hazards and other hazards. The risk levels of specific risks are rated on a six-point ordinal scale, ranging from 1 (the lowest) to 6 (the highest), and the risk level of safe jobs is coded as 0. Since workers may suffer from more than one specific risk in their jobs, the ratings on the scales are added together to get a total score for the risk level of the respondent's job. We then replace the general job risk by the risk level of occupations and re-estimate the hedonic wage model in column 3 of Table 6. The results show that risk levels have a significant negative effect on workers' hourly wage. An increase in the risk level is associated with a 1.18% decrease in workers' hourly wage. Table 8.Robustness checks, 2012 CLDS.

| **Panel A** |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Alterative measure of risk** | **WLS – Garen (1988)** | **TSLS – Lewbel (2012)** |  |  |  |
| General risk | −0.0118\*\*\* | (−2.68) | −0.3038\*\* | (−2.32) | −0.3713\*\* | (−2.37) |
| Residual |  |  | 0.1461\* | (1.84) |  |  |
| Residual  × general risk |  |  | −0.0831 | (−1.22) |  |  |
| Other variables | Yes |  | Yes |  | Yes |  |
| N | 2381 |  | 2375 |  | 2375 |  |
| Adjusted R2 | 0.264 |  | 0.265 |  | 0.242 |  |

| **Panel B: Propensity score matching** |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Nearest neighbour matching | −0.103\* | (−1.87) |  |  |  |  |
| Kernel matching | −0.090\*\*\* | (−2.72) |  |  |  |  |
| Stratification matching | −0.079\*\* | (−2.02) |  |  |  |  |

*Notes*: See notes to Table 2.Full results of other variables and strength tests of Lewbel (2012) IV approach available from the authors.WLS and TSLS denote weighted least squares and two-stage least squares regressions.

To address potential omitted variables bias and endogeneity, Garen's (1988) modified selection-bias correction technique and the Lewbel (2012) IV methods are employed to obtain consistent estimates of coefficients. The parameter estimates of the risk equation show that workers who have more children and higher non-labour income are less likely to engage in risky jobs, while those who undertook a health examination before commencing work are more likely to choose risky jobs.4 We find that homeownership status has no significant effect on the choice of risky jobs.

Estimates using Garen's (1988) modified selection-bias correction technique are reported in Panel A, column 2 of Table 8. After addressing potential endogeneity and omitted variables bias, the coefficient on general job risk is still negative and significant at the 95% confidence level. However, the absolute magnitude of the estimated general job risk coefficient increases from 0.0950 to 0.3038. After controlling for other variables, on average workers who undertake risky jobs earn 26.20% less in hourly wages than their counterparts in safe jobs. The Lewbel (2012) IV estimates are also presented in Panel A of Table 8. The results show that undertaking risky jobs has a significant negative effect on workers' hourly wage. The coefficient on general job risk, based on Lewbel's method, is slightly larger in absolute value than that obtained by Garen's (1988) method. The results from PSM are presented in Panel B of Table 8. The findings from all matching methods suggest that workers in risky jobs incur a wage penalty compared with those in safe jobs.

In Table 9 we employ decomposition approaches to evaluate the risk premium. The results show that workers in risky jobs are compensated by a negative wage premium, both at the mean hourly wage and across the distribution, which is consistent with the results from the PRDS. The mean log hourly wage gap between workers in risky and safe jobs is −0.05, of which −0.35 can be attributed to the negative wage premium, accounting for 9.81% of workers' hourly wage in safe jobs. The unexplained hourly wage gap varies from −0.03 to −0.88 across the distribution of hourly wages, accounting for 1.35–23.47% of workers' hourly wage in safe jobs. Table 9.Decomposition of compensating wage differentials, 2012 CLDS.

|  | **O-B decomposition** | **FFL decomposition** |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Mean** | **Quantiles** |  |  |  |  |  |  |  |  |
|  | **0.1** | **0.2** | **0.3** | **0.4** | **0.5** | **0.6** | **0.7** | **0.8** | **0.9** |  |
| Risky jobs | 2.61 | 1.68 | 2.02 | 2.24 | 2.41 | 2.60 | 2.80 | 2.96 | 3.19 | 3.56 |
| Safe jobs | 2.66 | 1.68 | 2.02 | 2.23 | 2.43 | 2.66 | 2.82 | 3.12 | 3.34 | 3.75 |
| Raw differentials | −0.05 | 0.01 | 0.01 | 0.01 | −0.02 | −0.06 | −0.03 | −0.16 | −0.15 | −0.19 |
| Explained part | 0.29 | 0.34 | 0.19 | 0.04 | 0.17 | 0.24 | 0.09 | 0.06 | 0.25 | 0.69 |
| Unexplained part | −0.35 | −0.33 | −0.18 | −0.03 | −0.19 | −0.30 | −0.12 | −0.22 | −0.39 | −0.88 |

**Discussion**

The theory of CWD suggests that workers engaged in risky jobs will be compensated in the form of a wage premium compared with those working in safe jobs. Contrary to what CWD theory would predict, the findings in this study for both the PRDS and the CLDS suggest that there is a negative relationship between occupational hazard and hourly wages in China's urban labour market. There are several potential reasons for this finding. For the most part, these explanations are consistent with the existing critiques of CWD theory that have been reviewed in the ‘Existing literature’ section.

A key assumption underpinning the theory of CWD is that there is a competitive labour market. The negative risk premium may reflect the non-competitive nature of China's urban labour market. A large body of literature shows that China's urban labour market is highly segmented, such as local and non-local segmentation, urban–rural segmentation and state-owned enterprises and non-state-owned segmentation (Knight and Yueh, 2009; Wang et al., 2015a). Workers in a segmented labour market are not able to change jobs whenever they choose. This applies a fortiori to less skilled workers (Hopkins, 1995). For instance, impeded by their *hukou* status, migrant workers often undertake jobs characterized by labour-intensive, low-skilled and hazardous conditions which are typically shunned by urban locals (Wang et al., 2015b). While the 1994 Labour Law and 2008 Labour Contract Law theoretically protect their interests, they have not readily been enforced in the case of low-skilled workers, employed in hazardous jobs in the non-state sector (Cheng et al., 2013). Even if migrant workers are aware of the occupational risk and understand their rights under the 1994 Labour Law and 2008 Labour Contract Law, they may be willing to accept lower, or even negative, wage compensation for job risk due to the unavailability of alternative employment, given the segmented nature of the labour market.

A second plausible explanation for the negative risk premium is the lack of bargaining power and information on occupational hazards. China has pursued rapid economic growth. In order to attract investment, some local governments collude with investors to keep wages down and ignore workplace health and safety. In some cases, they even put up barriers to impede monitoring by OHS agencies (Chen and Chan, 2010). There are many instances in which the ill effects of occupational hazards do not show any effect until years into the future. In this case, workers, especially migrant workers and those with low human capital who are disproportionally represented in the private and informal sectors, might have little, or no, bargaining power with employers to claim the wage premium for undertaking risky jobs and/or are unable to obtain full information in relation to occupational risk. While Chen and Chan (2004) found that trade unions had played a significant role in improving OHS standards in primarily state-owned enterprises and state-owned joint ventures, we found that in both datasets, being a trade union member does not play a significant role in helping workers in risky jobs get higher wages. We have a broader range of ownership forms than in Chen and Chan (2004). Although more than half of workers in the CLDS had joined a trade union, it is generally accepted that trade unions at the city or firm level in the non-state sector are still weak and their capacity to bargain with employers and provide information to employees is limited (Cheng et al., 2013; Liu and Li, 2014).

A third reason for the results is that, as the critique of CWD points out, people do not always weigh up the benefits and costs of their behaviour with perfect foresight as assumed by neoclassical economic theory. Instead, people tend to overly discount the potential negative effect of their behaviour now for the future (Akerlof and Dickens, 1982). Shiling and Brackbill (1987) suggest that in the late 1970s just 5% of workers in the United States were ‘fully informed’ about job hazards. As Leigh (1991) notes, lack of information may be particularly widespread among new entrants to dangerous jobs, such as migrant workers in China. Migrant workers in China are well known for being myopic when it comes to discounting the potential costs to their health in the future from working in hazardous conditions. For example, Li (2008) interviewed migrant workers in Tianjin about their reluctance to participate in health insurance. She found that migrant workers heavily discounted the risk of becoming ill. When asked about the dangers of working in hazardous environments or in high-risk jobs, the most common response was ‘it will not happen to me’. The participants in Li's (2008) study, similarly, were reluctant to take time off work for medical check-ups, consistent with a belief that the risk of long-term harm was low. Most participants considered that if they were to become ill in the future they could cope through returning to their hometown and relying on friends and family for support.

A fourth possible reason for why our results differ from those obtained by many previous studies might be related to the construction of risk measures. Most CWD studies use job-related mortality and injuries ***data*** by industry and occupation to reflect occupational risk and obtain a positive nexus between work-related fatalities or injuries and wages (Moore and Viscusi, 1990; Qin et al., 2013; Viscusi and Aldy, 2007). We differ from many studies in that we employ perceived job risk, which has the advantage that it is consistent with the theoretical foundations of CWD. CWD theory is based on three assumptions: utility maximization, worker information and worker mobility. This implies that CWD theory builds on workers’ perception, and understanding, of job risk, rather than (real) industrial level mortality ***statistics*** which neither employers nor employees necessarily know. Many studies use mortality rates as a proxy for ‘bad’ jobs, but not all ‘bad’ jobs are extremely dangerous. Thus, the conclusions from such studies are usually limited to specific industries such as mining in developing countries that have high mortality rates.

PRDS asked a yes/no question regarding whether their job is risky. CLDS asked workers six specific questions as to whether their jobs exposed them to dust, radioactive substances, chemical substances, physical hazards, biological hazards and other hazards. From these questions, we can see that the risk measures in this study are potentially much broader than in many previous studies. These occupational hazards could not only measure the risks of death and injury arising from potential accidents, but also imply hidden long-term risk and other risks that are harmful to individuals' health.

Measuring hidden long-term and other risks is important because while the risks of death and injury tend to be relatively rare events (Viscusi and Aldy, 2003), the hidden long-term and other risks are more common and usually more difficult for workers to claim compensation for. For instance, previous studies have estimated a wage regression model with both fatal and non-fatal risks and found non-significant coefficients on non-fatal risk measures (Guo and Hammitt, 2009; Kniesner and Leeth, 1991), while other studies even found a negative effect of non-fatal risk for both the full sample and blue-collar workers' wages (Hintermann et al., 2010).

Very few studies use similar risk measures for this study to examine the relationship between wages and perceived occupational risks. Their results suggest that undesirable working conditions, such as extreme cold and heat, vibrations and hazards have a significantly negative effect on wages (Brown, 1980), while the effect of exposure to the risk of liver diseases on wages is not significant (Liu and Hammitt, 1999). Guo and Hammitt (2009) found that exposure to harsher working environments had a positive effect on wages in China, but their conclusion only applies to urban workers.

Having said this, it is important to acknowledge that our risk measures also have limitations. A potential limitation of perceived risk measures is that respondents may have different reference points in assessing risk. Gaba and Viscusi (1998) found that, for a given level of risk, individuals with a college education were more likely to perceive the risk as dangerous than those with education lower than college level. This may result in upward bias in the estimated wage–risk trade-off. Nevertheless, after the standardization of subjective danger thresholds, they find that subjective risk measures yield more consistent estimates of wage premiums than objective risk measures. There are also limitations in terms of the specific risk measures we use. It might be argued that the response in the PRDS provides only a relatively crude basis for distinguishing between respondents on the basis of risk. The same is also potentially true of those from the CLDS. When considering the extent to which they represent risks faced by individual workers, it has to be recognised that the presence of a hazard does not necessarily mean that there exists an associated risk.

**Conclusion**

Our main empirical finding from both datasets is that having a risky job has a significant negative effect on workers’ hourly wage. While this result is inconsistent with the predictions of the theoretical model, we have suggested that there are plausible explanations for a negative risk premium in the context of a transitional labour market, such as that in China. More generally, our findings contribute to studies for developed countries that have failed to find support for the predictions of CWD theory. As Leigh (1991: 391) notes, these results suggest that ‘the compensating wage hypothesis itself bears closer scrutiny’. Some of the key assumptions on which CWD theory is based, such as widespread information about job hazards, rationality and perfect foresight, are questionable assumptions. These assumptions are central building blocks of much neoclassical economic theory, so many economists may be reluctant to forgo them. The fact is, though, that in other disciplines, such as epidemiology and psychology, it is well recognized that workers will often lack perfect foresight about job hazards and are not rational when it comes to weighing up alternative hazards (see e.g. Slovic et al., 1980). And within economics itself, behavioural economics is taking on board insights from psychology about lack of rationality in decision-making. As Camerer (1999: 10577) points out, ‘the only active resistance to behavioural economics is the pessimistic fear that the psychological evidence is too fragmented to suggest formal alternatives to rationality’, and this pessimism has repeatedly proved misplaced. Our results suggest a future research agenda on at least two fronts. One is empirical. More studies testing CWD are needed with better measures of risk. Such studies are especially needed for post-socialist economies, whose labour markets, in many ways, are least likely to conform with the assumptions underpinning CWD theory. The other is to think about ways in which CWD theory might be modified, for example using insights from behavioural economics, in light of the empirical evidence in studies such as this one. This is particularly so if future studies also find evidence contradicting the theory.

In terms of policy implications, our results suggest that lack of labour mobility, collective bargaining power and information on occupational hazards are important causes of a negative risk premium in China's urban labour market. Therefore, there is a need to further reform the urban labour market and the *hukou* system which segments the urban labour market. There is a need to establish fair compensation arrangements for workers, and to improve the OHS system – especially in the private sector, in which migrants and workers with low human capital are disproportionately concentrated. In addition, the government needs to grant trade unions more administrative power to monitor workplace health and safety, to become involved more directly in labour affairs and disputes and to organize collective bargaining.

**Notes**

1.Under the household registration (*hukou)* system, traditionally all Chinese citizens held either an urban or rural *hukou*. Rural–urban migrants continued to hold a rural *hukou*, which restricted their opportunities to find jobs, and resulted in various forms of discrimination, in Chinese cities. While the *hukou* system is starting to break down, it still contributes to a segmented labour market.; 2.Workers were asked a yes/no question regarding whether they are exposed to harmful work environments in general (e.g. toxic substance and excessive noise).; 3.The perceptions of risk being used actually relate to the presence of hazards rather than the probability of them causing harm. While it is clear from the safety literature that employers and workers can hold different perceptions of risk, it is hard to believe that they would disagree concerning whether particular hazards are present.; 4.The probit results are not presented but are available upon request.

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[***Consumption and Population Dynamics in Nigeria: Analysis and Micro simulations using Fertility Rate Variants***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:6BM3-50R1-JBMY-H1MN-00000-00&context=1516831)

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**Body**

**ABSTRACT**

This paper examines how changes in Fertility Rate Differentials affect household portfolio demand (expenditure on food, monetary transactions, goods and services and non-cash expenditure) in Nigeria. The paper disaggregated household portfolio into four categories and established a link between population dynamics (demographic variables) and household expenditure components using the Vector Error Correction Methodology. The estimated equations are used to project the pattern of the different components of household demand based on the optimum case population scenario. The results suggest that fertility dynamics in Nigeria can produce significant effects on the economy via the expenditure profiles of households.

**FULL TEXT**

For most of this century, demographers have been intrigued by the consistencies of population issues in many different settings. These issues were considered so important that their occurrence spurred the development of the major body of conceptualization in demography. However, this notion gained momentum just after the publications by Davis (1945) and Notestein (1945), although the full essence of the contingency between modernization and declining mortality; fertility and the three-stage evolution had already been formulated by Thompson in 1929. Furthermore, the major elements of the subject matter had also been addressed previously by Landry (1909, 1934) and in the work of Carr-Saunders (1922, 1964/1936). Also, the classic representation of the demographic transition, sketched by Notestein, shows that mortality declined in the wake of the industrial revolution, which brought material changes in the sense of ***agricultural*** innovation, better communication, higher productivity, and improved health conditions. Nonetheless, fertility was much less responsive to such modernization, and its decline depended to a large extent on the collapse following mortality decline of normative systems that supported high fertility.

One of the most salient features of Nigeria’s economy is that since 1980, it has not shown real growth despite increasing population growth; however, the GDP per capita in 2006 was almost the same as it was in 1980 (Bloom et al., 2010). In 1980, Nigeria’s GDP per capita was slightly higher than that of Indonesia and Pakistan. Since then, Nigeria’s economy has stagnated, while Pakistan, and especially Indonesia, has grown considerably. Indonesia’s income per person is now roughly twice that of Nigeria. Meanwhile, East Asia in particular and the rest of the world have zoomed ahead. Part of the drag on Nigeria’s economy has been demographic. Since independence, Nigeria has struggled against very high fertility rates and high mortality, resulting in a high ratio of children in the population. Only since the 1980s have fertility rates begun to decline, albeit very slowly. Nigeria’s current fertility rate remains higher than in sub-Saharan Africa as a whole and is more than twice the world average fertility rate. The burden on society is reflected in the ratio of working-age to non-working-age population, which has declined since independence. But the demographic tide is turning, with falling crude birth and death rates beyond 2010, and fertility rates are also expected to continue falling. As a result, the share of working-age people in the population is expected to rise significantly from 2010 to 2050 (cited in Bloom et al., 2010), for the ratio of working-age to non-working age. Nonetheless, demographic change was not the only drag on Nigeria’s economy in the past. Other factors which have hindered Nigeria’s previous growth threaten its ability to realize its demographic dividend in the future. In particular, Nigeria’s institutions (example: rule of law, government capabilities in numerous realms, corporate ethics, civil liberties, interaction between private actions and public goals) are mediocre in African terms and poor when compared with countries from other regions (Bloom et al., 2010). Similarly, regional and ethnic inequalities, very low levels of investment in education and health, and a culture of youth violence pose significant challenges to Nigeria’s ability to benefit from its demographic transition (Alao, 2010).

The shape and structure of economic lifecycle, summarized by the amount consumed and by the amount produced through labor at each age, is important in understanding the interaction between age structure and the economic development of any country (Lee et al., 2008). There are extended periods at the beginning and end of life during which members of the population on average consume more than they produce through their labor. These periods of dependency bracket a period during which labor income substantially exceeds consumption. Nigeria, like most other countries in sub-Saharan Africa, is just beginning the transition to low fertility, but the economic support ratio for the country is not expected to peak for another 40 years or more. Although experiences of countries that already have a demographic dividend may be instructive for Nigeria, it is important to understand the general lessons that can be drawn from the experience of other countries. Nigeria’s economic life cycle is not conducive to a fast take-off. In particular, low labor income among young adults is a serious problem. If fertility decline is more rapid than anticipated and if labor conditions improve for young adults, then the economic support ratio will rise more rapidly and Nigeria will enjoy a larger demographic dividend over the next decade or two.

Population is both the producer and consumer of social and economic goods and services. Poor economic growth, which does not match the pace of increase in population numbers, puts more pressure on the limited capacity of governments to provide for basic socioeconomic needs. Recent studies on the nexus between population change and economic growth have two key features in common with another study that was published more than 50 years ago: Coale and Hoover’s book on *Population Growth and Economic Development in Low-Income Countries* published in 1958 (Coale and Hoover, 1958). These studies highlight and explain the fundamental insight that reducing the current rate of population growth does not lead always correspond to a reduction in the current rate of labor force growth. However, these studies also share some potentially significant limitations. Firstly, the imposition of a model in which causality runs only from population growth to income growth is at odds with established microeconomic theory and empirical evidence, which posits that income levels influence the growth and structure of population. For example, people with high incomes tend to place a high implicit value on their time. For example, given that child rearing is time intensive, it is not surprising that high-income earners also tend to have fewer children. This suggests that income growth tends to promote fertility decrease. Secondly, attention to population age structure is the key in both the study by Coale and Hoover and the recent literature. However, population growth and changes in age structure are only two of several plausible demographic influences on economic growth.

Furthermore, an important feature of the modern literature regarding the effects of demography on economic growth is the introduction of a broader definition of demography than simply the population growth rate (Barlow, 1994; Bloom and Freeman, 1988; Bloom and Sachs, 1998; Bloom and Williamson, 1997; Brander and Dowrick, 1994; Coale, 1986; Kelley and Schmidt, 1995). A finding from the recent economic development literature concerns the positive effect of good health status, as measured by life expectancy, on economic growth. Mason (1988) confirmed that this finding shows the greater incentives long-lived people have to save for old age. Furthermore, Meltzer (1995) shows that there are increased returns to investments in human capital associated with having longer horizons over which to recoup those returns, leading to higher productivity, and lower rates of absenteeism.

**Conceptual Issues**

**Theoretical Framework**

A striking feature of contemporary literature is the cosmetic attention given to the effects of population dynamics on economic growth. The basic framework acknowledges the possibility that rapid population growth might drag down economic growth. More often than not, demographic changes does not emerge as being significantly associated with the pace of economic growth, thereby supporting the conclusion of population neutralism (Bloom and Freeman, 1986) that has held sway for nearly two decades (Kelley and Schmidt, 1995). Recently, demographers have revisited the connection between population dynamics and development, and emphasized that demographic transition is the key factor underlying population growth in most countries (Bloom and Canning, 1999; Bloom and Freeman, 1988; Bloom and Sachs, 1998; Bloom and Williamson, 1997).

Nonetheless, demographic transition is a change from a situation of high fertility and high mortality to one of low fertility and low mortality. This indicates that high rates of population growth are temporary consequences of the decline in mortality before the decline in fertility. Less widely recognized, though perhaps more important, it also suggests sizable changes in the age distribution of the population. These changes occur for two major reasons. Firstly, the initial mortality decline is concentrated among infants, thereby concentrating its effects at the lower end of the age distribution. Secondly, the consequent fertility reduction has an effect on the age distribution that is, naturally, entirely concentrated at age zero. The combination of these two factors introduces a bulge into the population pyramid. Thus, over time, the bulge ages and moves from being concentrated among young people to being concentrated at the prime ages for working, saving, and reproduction, and eventually, to being concentrated at the years of old age. The young and the old tend to consume more output than they generate, unlike working-age individuals, whose contribution to output and to savings (Kelley and Schmidt, 1996; Lee et al., 1998; Mason, 1988; Webb and Zia, 1990) tends to be more than commensurate with their consumption. Consequently, the value of output per capita, which is the most widely used indicator of economic viability, tends to be boosted when the population of working-age persons is relatively large, and vice-versa when a relatively large part of the population consists of young and elderly people. In addition, a decline in the youth dependency ratio increases schooling per child to rise, adding to a possible future economic growth.

One of the significant issues of demographic aspects of economic development is that population changes, through its effects on population size, age structure and population distribution, affects the level of demand for consumption goods as well as its patterns. These changes of consumption pattern and level in turn affect overall and sectoral economic development. Knowledge of the determinants of household choices is important for many aspects associated with policy and economic analysis. Consumption by households is a determinant of sustainable development, and it has economic and social dimensions. It has important implications for the level and pattern of production, and for related demands for natural resources. Growth of private consumption has both positive and negative economic effects.

Malthus made his mark in the field of classical and Marxist economics in the 19th and beginning of the 20th century and in the economic analysis of population and development (United Nations, 1973). These macroeconomic approaches never became standard material in demographic theorizing, unlike the microeconomic orientations that firmly entered the field in the 1960s. Harvey Leibenstein (1957) may be called the progenitor of the view that the number of children is the result of individual decision-making within an economic context of income and prices. Among others, Willis (1973), Schultz (1981), and, most prominently, Gary Becker (Becker, 1981) developed the consumer choice theory into what became known as the new home economics of the Chicago school. The microeconomic approach not only involves the traditional variables of income and prices, but also the budget constraints in terms of allocation of time and opportunity costs. Given these variables, households are assumed to produce a bundle of consumer commodities in accordance with the maximization of household utility. The model links fertility decisions to other household decisions, including labor force participation and consumption. The notion of *child quality* became a key factor in Becker’s work to account for the inverse relation between income and number of children as experienced in the fertility transition. The quality of children also is assumed to be elastic with respect to income, whereas the quantity of children is not. This implies that the desired number of children may fall as income increases because the average cost per child may increase even faster.

The nexus of challenges to Nigeria’s sustainable development links population, household expenditure and economic growth together. The connection is indeed very complex. Nevertheless, proper understanding of how they interact is fundamental to the development of any sustainable economic policy in the country. Population is both the producer and consumer of social and economic goods and services. Poor economic growth, which does not match the pace of increase in population numbers, puts more pressure on the limited capacity of governments to provide for basic socioeconomic needs.

**Fertility Projections in Nigeria: Historical Overview**

The fertility inputs in the projection exercise are the Gross Reproduction Rate (GRR) that were obtained by applying a sex ratio at birth of 104 to the Total Fertility Rates (TFR) estimated from the 1991 Post Enumeration ***Survey*** (PES). Projected values of GRR were obtained based on the assumptions of the time it would take to reach a replacement level of 1 with the onset of fertility decline. The Economic Commission for Africa (ECA) has recommended similar assumptions for some Africa nations in population projection (ECA, 1986). The pattern of fertility decline is based on the stage of demographic transition and some results of family planning programs in Nigeria, from the results of the 1980 Nigeria demographic sample ***survey*** (NDSS), the 1981/82 Nigeria Fertility ***Survey*** (NFS) and the 1990 Nigeria Demographic and Health ***Survey*** (NDHS). At the state level, time-series ***data*** were not available for a similar evaluation. As indicted in the Analytical Report (Federal Office of ***Statistics*** of Nigeria, 1998), TFR values exceed the national average of 5.89 in 22 states and Abuja (Federal Capital Territory). The estimated GRR values indicate that a woman would replace herself with three female births in her lifetime in almost all the states. The past fertility rates, as stated above, suggest that Nigeria will not achieve a GRR of 1 in less than 50 years, and 1 after 70 years, i.e. at the rate of 6.7% decline every 5 years. With the high fertility in Nigeria, coupled with this background, it was assumed that fertility would decline at various rates until a replacement level of 1 is achieved in the future. The above assumption is applicable to all the states. However, they will achieve replacement level at different rates of decline during the projection period due to variations in the level of TFR and socioeconomic development. The age patterns of fertility and sex ratio at birth depicted by the 1991 Population ***Census*** and the PES were assumed to remain the same throughout the projection period. Due to the levels of TFR between 1980 and 1990, a medium variant (optimum case) of fertility decline was assumed for our analysis. However, the pessimistic and base cases were used in context for comparison effects.

**Fertility variants**

High variant: the high variant of a population growth pattern assumes that fertility will decline more slowly than the medium and low variant, and would reach a replacement level 10 years after the medium variant. Furthermore, the demand for, and supply of, the socioeconomic environment will continue to encourage mortality decline. International migration will be insignificant during the projection period. The total fertility rate is assumed to decrease gradually, to a value of 5.0 by 2005. The ultimate TFR will therefore be achieved after 35 years from 2025. This pattern implies a high and continuous population growth more than in the low and medium variants.

Medium variant: in the medium variant, the GRR is assumed to decline steadily at the rate of 6.5% to reach an ultimate level of 1 after 60 years. For this target to be achieved, it is assumed that the demand for and supply of family planning services with socioeconomic development be accelerated to encourage faster fertility decline. Contraceptive use in the 1990 ***survey*** was nearly negligible, but the medium projection shows it growing to about 28% over the 20 years from 1990 to 2010, at 1.1% a year; and continuing. Due to a young age structure and a high TFR the population in the decade before 2010 is projected to grow rapidly, by 23%-27% depending upon the projection chosen. (NDHS 1990). Fertility will decline more rapidly than the high variant, until it stabilizes at an ultimate level of 3.15 children per woman. It is assumed that the total fertility rate will decline slowly during the first 20 years, then faster until the replacement level is reached. It is expected that the TFR will be 5.47 between 2010 and 2015 and it will therefore continue to decline at faster rate from 2015–2020 until it reaches 3.15 in 2050. Despite the achievement of a replacement level of 1, the population will continue to increase due to the growth momentum in the age structure of the population.

Low variant: the rate of decline GRR under the low variant is assumed to be the fastest to achieve a replacement level of 1 after 50 years. The low variant assumes a faster decrease thereafter to reach a replacement level 10 years earlier. This accelerated rate of decline will occur with rapid socioeconomic progress and strong and effective family planning programs. As with the other variants, it is assumed that the fertility reduction factors will be favorable to a decline in TFR from 5.89 in 1990 to 3.20 in the 2015–2020 periods. At this accelerated rate of decline, a replacement level of 1, the population will continue to grow but at a slower rate.

**Mortality Assumptions**

The basic mortality inputs, both at the national and state levels, in the projections are the expectations of life at birth (e0) by sex. They correspond to the pattern of mortality implied by the North model life table (Coale and Demeny, 1966). Assumption on the future gains in life expectancy were made, taking into consideration the level of longevity already attained and the possible effects of any mortality and morbidity-reducing programs underway in Nigeria (Okoye, 1992). However, prevailing socioeconomic factors may not facilitate rapid and continuous mortality decline in Nigeria. As a result, it was assumed that the improvements (not the normal life table’s yearly increment) in expectation of life at birth by sex would vary under the three variants. Expectation of life (e0) at birth by sex is assumed to increase steadily. At the present estimates of e0 of 52.6 and 53.8 for male and female, respectively, it was assumed that the e0 will appreciate averagely at 1.6 and 1.8 quinquennials, respectively. These improvement rates were assumed based on the current e0 levels and pace of socioeconomic development in Nigeria.

The component of consumption expenditure will continue to rise in the future especially as the population is projected to increase. The next expenditure component in order of importance, but with growing tendency to decrease, is expenditure on goods and services. It accounts for about 28% of total household expenditure as at 1989. By 1996 its share of the total has decreased to about 16%. It started rising again in 1999, after reaching an all-time low in 1998. Hence, after another record low in 2003 it is expected to rise again into the future, especially as the population expands. Expenditure on monetary transactions and non-cash expenditure as percentage of total are exhibiting a decreasing share, with only monetary transaction expenditure showing signs of recovery beginning from 2001. The present study sheds more light on the time part of these variables over time.

***Data* and Methods**

**VECM Analytical Framework**

The specification shown below was used to estimate equations for four components of disposable income expenditure categories: food, (**CEXFOOD**) monetary transaction (**CEXMONTRAN**), non-cash expenditure (**CEXNCE**) and other goods and services (**CEXOGAS**). The specification shown below is used to estimate equations for four expenditure categories: goods and services (CEXOGAS), expenditure on monetary transactions (CEXMON), expenditure on food (CEXFOOD) and non-cash expenditure (CEXNCE). The equations serve as a basis for projecting household expenditure. Projected expenditures sum up the disposable income, which is used in estimating the private consumption function. The general specification of the expenditure equation is:

(1)Expenditure(YD)=f(Pop,Pcy,Int,Roete)

The general specifications of the disposable income expenditure equations for households are:

(2)CEXFOOD=f(Pop,Int,Roete,Pcy)

(3)CEXMONTRAN=f(Pop,Int,Roete,Pcy)

(4)CEXNCE=f(Pop,Int,Roete,Pcy)

(5)CEXOGAS=f(Pop,Int,Roete,Pcy)

Where

**Exp** = expenditure categories (CEXFOOD, CEXMONTRAN, CEXNCE and CEXOGAS)

**Pop** = population variables (AVPOP*5* and below, AVPOP*5-14*, AVPOP15-24,

AVPOP25-34, AVPOP35-44, AVPOP45-54, AVPOP5*5-64*, AVPOP*65 – 74* and AVPOP75 and above)

**Int** = interest rate

**Roete** = ratio of other exp categories to total exp

**Pcy** = per-capita income

The equations are estimated in log-linear form. The E-Views Software has an in-built Lag Selection Criterion. This tries to see the impact of past historical information on current situation. We chose to lag for only a period because of robustness of results and to avoid Type Errors. Lagging is done because most policy frameworks require a bit of time for the effects to be seen. Thus within a year, we argue that the effects of population dynamics would have been seen on expenditure patterns.

The sampling period used for the equations is 1980–2010 and a lagged dependent variable was introduced on the right-hand side in each of the five equations to test for serial dependence. The signs of the right-hand side variables varied. The interest rate have a negative sign for CEXFOOD, CEXNCE, CEXOGAS and positive sign for CEXMONTRAN; the ratio of other expenditure categories to total expenditure had a negative sign, while population variables had a positive sign for all expenditure categories of the disposable income, and per-capita income had a positive sign against all endogenous variables. The per-capita variable in the model increases expenditure from the demand side, thus measuring how elastic income of households are, just as an increase in any of the specified age bracket raises aggregate demand schedule of households and vice-versa.

**Testing for Stationarity**

Testing for stationarity involved the use of several tests; namely the Dickey–Fuller (DF) tests; Augmented Dickey–Fuller tests (ADF); Phillips–Perron tests (PP) and Akaike Information Criterion (AIC).

DF, ADF and PP procedures involve testing whether variables/series in a model are stationary or testing the order of integration through unit root tests. The DF test is a test against the null hypothesis that there is a unit root series integrated of orders one (i.e. I (1)). The ADF test is the same as the DF, except that here augmentations in terms of lags of Xt are incorporated. All the tests were run at a 1% and 5% level of significance. An attempt was made to strengthen the test by systematically eliminating insignificant lags to finally establish the optimal lag length. To avoid over-differencing the variables therefore, we ignore the suggestion by the ADF test that some of the variables are integrated of orders higher than one. This assumption is consistent with econometric theory, which postulates that most macroeconomic variables would exhibit unit roots, becoming stationary after first differencing. Otherwise macroeconomic variables would likely be stationary. The test for unit root using the ADF indicated that real gross domestic product, private investment, public investment and real exchange rate are non-stationary, with one as the order of integration.

**Results**

Domestic credit to the private sector and real interest rate were shown to be stationary series. All tests were significant at both 5% and 1%. The lag length criteria (AIC) did not improve with further increases in the lag length.

Using our ***data*** set we estimated micro equations on the four expenditure categories to project the household aggregate consumption and hence the disposable income up to 2017, as well as their growth rates over the same period on the base line, optimum, and pessimistic population projections.

**Equation Results: Expenditure on Goods and Services**

In general, estimation of this equation using a lagged dependent variable1 improves the result, looking at the information criteria and *R*2 ***statistics***. The results suggest that this expenditure category increases as people become older. This is so because old people tend to consume more than the young.

Results in Table 2 present a robust outlook using the information criteria and *R*2 ***statistics***. The results suggest that expenditure on this category decreases as population dynamics spreads. The age bracket of 18–24 and 25–34 show a strong influence on this expenditure pattern of the household. This becomes obvious given the excessive demand of the people within this age bracket. It is within this age bracket that most people begin to increase their demand for goods and services as they settle down into married life, and experience has shown that demand for goods and services by people within this age bracket is more than eight times the demand by the older segment of the population (i.e. people above the age of 65). The estimated equation seems to support the above view.

In general, estimation of this equation using a lagged dependent variable worsens the result. The results suggest that expenditure on this line item is correlated to the working-age bracket. This is due to the belief that these individuals are in a position to use non-cash methods such as credit cards, value cards, cheques, etc., to make most of their purchases and payments. Results indicate that households have less of their income to spend on this category.

Further simulations show that the percentage change between the base line and optimum and between the base line and the pessimistic projections for expenditure on food, and goods and services is increasing over time, while that for monetary transactions and non-cash expenditure is negative but decreasing in absolute value, which implies increase as well. However, the percentage change between base line and pessimistic projection is wider than the percentage change between base line and optimum projection, thus suggesting that population dynamics have significant effects on the growth rate of consumption expenditure.

These findings reinforce the previous results in the aggregate case. The percentage increases are offset by the percentage decreases so that in the long run, consumption expenditure follows a constant growth path, despite the increases projected for the total population. This prediction is consistent with the Solow2 growth model which concludes that changes in consumption, savings and investment as well as population increases cannot account for sustained increases in either the standard of living or in economic growth. Such sustained growth can only be achieved through increases in technological progress. From the foregoing, it is obvious that fertility differentials in Nigeria may pose adverse effects on the socioeconomic wellbeing of the country.

In addition, the graphs show how the aggregate household consumption changes over time. The base line projection (Figure 1) shows that aggregate real consumption between 2005 and 2008 would be on the decrease and thereafter begins to grow, reaching all-time high of 2.9% by the year 2010. The projection further shows that aggregate consumption would plummet to about 2% by the year 2011 and stabilizes there for the rest of the period until 2017. This is because the fall in the growth rate of non-cash expenditure and monetary transactions would be counter-balanced by the increase in growth of the expenditure food and expenditure on goods and services, so that the aggregate consumption remains stable at about 2% despite the threat of total population increase.

**Figure 1.**

Percentage change in disposable income (base case projections).

The results from optimum projection (Figure 2) suggest a two-period variation in aggregate consumption over the projection period as the population expands. First, the projections show increasing consumption between 2006 and 2010 of about 3%, and thereafter it decreases to about 2% and remains constant until 2017 despite the threat of population growth over the projection period.

**Figure 2.**

Percentage change in disposable income (optimum projections).

The pessimistic projection (Figure 3) shows a somewhat different picture for aggregate consumption expenditure. The graph shows that as population expands, the growth rate of aggregate expenditure converges to about 2.9%. One common characteristic observed from the results is stability in the growth of aggregate consumption expenditure. This is suggestive that the current reform policies in Nigeria as well as the realization of the millennium development goals would lead to economic stability but may prevent rapid growth rate of the economy. Also, population dynamics are likely to lead to a rise in the aggregate consumption expenditure of the household, looking at the figures for the pessimistic projections. This would have profound implications for the growth of the Nigerian economy, realizing that consumption expenditure alone accounts for about one-third of total aggregate expenditure of the economy. High consumer spending, especially on goods and services, is needed to encourage investment and thus propel growth in any economy.

**Figure 3.**

Percentage change in disposable income (pessimistic projections).

Generally, our results reveal an interesting path for household consumption expenditure as the population expands over time. We found that expenditure on food will continue to dominate the other components of household consumption expenditure in the long run, followed by expenditure on goods and services (Figure 4). As higher population is projected into the future, it is expected that households will spend more on food, as well as on goods and services, than on other categories of expenditure (i.e. non-cash and monetary transactions expenditure). This could be attributed to the fact that population expansion is consistent with increases in the demand for food as well as the demand for goods and services, especially in a typical developing country.

**Figure 4.**

A comparison of base case, optimum and pessimistic projections in disposable income in Nigeria.

**General Discussion**

The estimated elasticities shown in Table 1 indicate that other factors remaining constant, one percentage increase in the ratio of other expenditure categories results in about a three percentage real decline in the spending on goods and services. This could be attributed to the fact that as other expenditure categories, such as payment of house rents, school fees, etc., become due for payment, an extra burden is added to households. Thus, the demand for goods and services would decline or at least be postponed. A 1% increase in real interest rate decreases household expenditure on goods and services by about 2% (probably due to wealth effects).

**Table 1.**

Population dynamics and expenditure on goods and services.

| **Variables** | **LnCEXOGAS** | **LnCEXOGAS** | **LnCEXOGAS** |
| --- | --- | --- | --- |
| Constant term | 2.56(1.341) | −5.3(4.031) | 7.02(2.143) |
| LnCEXOGAS (-1) |  |  | 0.326 (1.531) |
| LnAVPOP5 | −0.876 (−2.169) |  | −0.183 (−1.786) |
| LnAVP6-11 |  | 0.321 (−3.021) | −0.573 (2.113) |
| LnAVP18-24 | 1.783 (2.391) |  | 3.06 (−3.184) |
| LnAVP25-34 |  |  | 2.523 (1.340) |
| LnAVP35-44 |  |  | 1.784 (−2.727) |
| LnAVP45-54 | 1.987 (2.241) |  | 1.534 (−3.43) |
| LnAVP55-64 |  | 0.308 (7.753) |  |
| LnAVP65-74 |  |  | −0.354 (3.213) |
| LnAbove75 | 0.112 | −0.345 (5.907) |  |
| LnInt | −1.456 (6.32) |  | −2.213 (0.231) |
| LnRoete |  |  | −3.098 (−2.564) |
| LnPcy |  |  | 1.987 (−2.341) |
| R 2 | 0.789 | 0.565 | 0.875 |

The results from Table 2 further suggest that people above the age of 45 do form a significant part of household total demand for goods and services. Hence, the ageing component of the population is still important in determining the aggregate expenditure of the household on goods and services, despite the higher expenditure by the younger generation or age groups. Members of the household below the age of 5 do not seem to have any positive influence on the household demand for goods and services. As the per-capita income increases, the household expenditure on goods and services increases. More specifically, one can say that household expenditure on goods and services is income elastic. The estimated elasticities also indicate that other factors remaining constant; a 1% increase in the interest rate results in over a 3% real growth in the spending on monetary transactions (this could still be attributed to wealth effect); a 1% increase in household per-capita income increases expenditure on monetary transactions by almost 3%; while a 1% rise in the ratio of other expenditures to the total expenditure causes the household expenditure on monetary transactions to fall by almost 2%. The results also indicate that as population of people within the age bracket of 18–75 begin to increase their expenditure on monetary transactions, households have less to invest (Table 2). Thus a negative relationship between population dynamics and monetary transactions becomes clearer, especially at the middle age brackets when people involve themselves more and more in financial transactions. Moreover, people who are in the middle age brackets find it relatively easier to borrow money to spend than the younger segment of the population. The life cycle hypothesis predicts that at middle ages people would involve themselves in a lot of monetary transactions as they pay off accumulated debts at the start of life and begin to acquire financial assets such as shares, bonds, as well as other real estates in order to provide for the age of retirement. Also, people within this age group spend money on the payment of school fees for their children and other forms of child-related expenditure. All these factors help to explain increases in monetary transactions in Nigeria as the population spreads. We also found from the estimated equation that past expenditure of the household on monetary transactions does have a significant positive elasticity on current expenditure. This is in agreement with the relative income hypothesis that predicts that immediate past expenditure has some significant positive effect on the current spending of the household.

**Table 2.**

Population dynamics and expenditure on monetary transactions.

| **Variables** | **LnCEXMON** | **LnCEXMON** | **LnCEXMON** |
| --- | --- | --- | --- |
| Constant term | −4.8 (5.97) | 2.65 (−6.462) | 3.12 (2.198) |
| LnCEXMON (-1) | 0.696 (−2.098) |  | 0.391 (6.310) |
| LnAVPOP5 | 1.473 (3.121) | 1.836 (2.407) | 2.563 (0.231) |
| LnAVP6-11 | 1.789 (−3.432) |  | 0.361 (2.09) |
| LnAVP18-24 |  | −1.869 (−5.241) | −1.805 (3.139) |
| LnAVP25-34 |  | −1.672 | −2.634 (0.563) |
| LnAVP35-44 |  |  | −3.654 (−1.784) |
| LnAVP45-54 |  |  | 1.972 (−1.919) |
| LnAVP55-64 | 1.337 (1.239) |  |  |
| LnAVP65-74 |  |  | −2.348 (5.218) |
| LnAbove75 |  |  |  |
| LnInt |  | 1.973 (0.671) | 3.389 (0.764) |
| LnRoete |  |  | −1.953 (−2.31) |
| LnPcy |  |  | 2.786 (−1.221) |
| R2 | 0.542 | 0.613 | 0.861 |

The results from Table 3 suggest that all the exogenous variables have a positive relationship with the endogenous variable except the interest rate. It would therefore be safe to infer that as the interest rate increases, forward-looking households would reduce the current spending on food in order to invest their money so as to earn a high-interest income that would guarantee them higher future consumption (Table 3). The results indicate in general terms that households would be more inclined to spend on food subsequently unless there is a shift in policy. Results show that those between the ages of 18–64 drive this expenditure pattern, as their corresponding elasticity coefficients are greater than unity. This pattern of household expenditure on food explains the high incidence of poverty and high level of underdevelopment in Nigeria. Development theorists such as Ragnar (1961) predict that high consumption expenditure on food in most least developed countries (LDCs) is an indication of underdevelopment. This result, however, confirms the high level of underdevelopment and poor standard of living of the Nigerian populace. We also found that immediate past food expenditure does have a positive, though not a significant, influence in the current expenditure. Furthermore, the estimated elasticities in Table 4 suggest that non-cash expenditure decreases with age brackets 5–24 because this household category does not have many non-cash transactions to make, as they are dependents and can spend only when they are given cash. The positive elasticity on interest rate with respect to this expenditure category suggests that a high interest rate could mop up cash balances in the economy, as households would undertake more saving and use advance payments receipt and other means to pay for their purchases3.

**Table 3.**

Population dynamics and expenditure on food.

| **Variables** | **LnCEXFOOD** | **LnCEXFOOD** | **LnCEXFOOD** |
| --- | --- | --- | --- |
| Constant term | −0.452 (3.11) | 1.231 (0.716) | 1.338 (0.227) |
| LnCEXFOOD (-1) | 1.705 (9.932) | 1.842 (−1.49) | 2.653 (0.573) |
| LnAVPOP5 | 1.032 (7.231) |  | 0.867 (2.509) |
| LnAVP6-11 |  | 1.467 (2.117) |  |
| LnAVP18-24 |  |  | 1.987 (3.103) |
| LnAVP25-34 | 0.459 (4,481) | 1.936 (−6.341) | 2.532 (0.541) |
| LnAVP35-44 |  | 1.876 (1.872) | 2.337 |
| LnAVP45-54 | 1.876 (−3.315) |  | 1.357 (0.657) |
| LnAVP55-64 |  |  | 1.875 (1.219) |
| LnAVP65-74 |  |  |  |
| LnAbove75 | −1.814 (4.512) | 1.980 (−0.432) |  |
| LnInt |  |  |  |
| LnRoete |  |  | −2.883 (4.381) |
| LnPcy | 1.983 (0.897) | 1.992 (0.841) | 2.234 (0.284) |
| R2 | 0.501 | 0.764 | 0.982 |

**Table 4.**

Population dynamics and expenditure non-cash expenditure.

| **Variables** | **LnCEXNCE** | **LnCEXNCE** | **LnCEXNCE** |
| --- | --- | --- | --- |
| Constant term | 1.032 (−4.351) | 0.756 (4.423) | 0.865 (1.784) |
| LnCEXNCE (-1) | 0.234 (0.761) | 0.345 (1.307) | 0.452 (2.324) |
| LnAVPOP5 | 1.481 (2.112) |  |  |
| LnAVP6-11 | −1.739 (−3.334) | −1.801 (0.413) | −2.231(0.467) |
| LnAVP18-24 |  |  | −3.014 (−2.098) |
| LnAVP25-34 |  | 1.983 (−1.285) | 2.876 (1.345) |
| LnAVP35-44 |  |  | 1.975 (0.327) |
| LnAVP45-54 |  | 0.832 (2.642) |  |
| LnAVP55-64 | 1.349 (4.876) |  | −3.815(−2.326) |
| LnAVP65-74 |  |  | −2.362 (3.312) |
| LnAbove75 | 0.874 (2.221) |  | −1.672 (−4.610) |
| LnInt | 0.830 (3.431) | −1.451 (−3.032) | −2.970 (1.098) |
| LnRoete |  |  | −.4.853 (−0.116) |
| LnPcy |  |  | 2.993 (2.174) |
| R2 | 0.729 | 0.664 | 0.935 |

Available ***statistics*** suggest that Nigeria has started a demographic transition. A major issue, however, is whether the decline in fertility is real or due to problems with the ***data***. While some evidence suggests that there has been an underestimation of births, ***data*** on other proximate determinants of fertility appear to be inconclusive. There is a need to strengthen initiatives made in health care to ensure that preventive and curative health services reach many women and children. This will contribute to the achievement of a sustained demographic transition. Economic difficulties in maintaining large families as a result of the economic crisis are forcing people to change traditional beliefs in large family sizes and the traditional system of the African extended family that had hitherto led to high fertility rates. At the same time, the desire for child bearing is still strong in Nigeria, particularly in the rural areas. This has given rise to the strong view that the levels of fertility and contraception use are not likely to change until there is a drop in desired family size and until the idea of reproductive choice is widely accepted.

Nonetheless, fertility impact has been felt within child and maternal health, human capital investment, natural environment and economic growth of the country. Recent studies suggest that a high fertility rate places children at high risk, with the impact of high fertility considered a critical human capital investment within formal schooling. However, parents need to decide to have fewer children in order to invest more per child, with school investment salient. Policies on fertility reduction have been an effort that needs to encourage couples to reduce the prevalence of large siblings-sets that are obstacles to the schooling of their members (Casterline, 2010).

The impact of fertility differentials is greatly felt on the available services, increased expenditure on goods, rapid population growth, and increased imported food and consumer goods, with the emergence of street children within the economy. As a result, poverty and unemployment rate have increased, with rural urban migration on the rise. The changing trends in expenditures on food within this society are obvious, with the implication of most national income spent on food, monetary transactions between the have and have not, and with an increased demand for imported food products which has caused harm to the domestic market. However, the high fertility rate has been attributed to the early marriages that are still a common practice in most parts of the country, with three-quarters mothers getting married before the age of 18 years. Moreover, contraceptive use is very low, with a high demand for children due to tradition, religion and high infant mortality in most parts of the country (Ogujiuba and Ade, 2005).

A recent study indicates Nigeria’s engagement in demographic transition, but with some doubts on the accuracy of the information released, as most of the results underestimated records on births. However, Nigeria needs to strengthen its initiatives within the health care milieu in order to ensure that preventive and curative health services are made available to most women and even children, as this will help achieve a sustainable demographic transition (Schultz, 2007). The challenges of maintaining large families as a result of the high fertility rate are now pushing people to change their traditional beliefs in large family sizes and the traditional system of the African extended family. Thus, having many children is no longer a source of pride within most African societies, as they are aware that a large family size entails greater expenditure. Despite this, the desire for child bearing in Nigeria is still very strong, especially within the rural areas, and this has led to a strong view that the fertility level and the rate of contraceptive use will not change unless there is a drop in the desire for family size (Ogujiuba and Ade, 2005).

It is therefore recommended that the government integrates population variables in socioeconomic development, and policy makers, planners and grass root community agents should appreciate the need for balanced development within the economy. However, programs that are geared towards development should be introduced at the grass root level, with collaboration between governments, NGOs, the private sector, community leaders and religious organizations on issues related to development and population dynamics initiated. Moreover, strategies that are aimed at reducing poverty, especially involving income generation and employment creation, should be integrated into policies and programs within the various sectors. It is therefore necessary that structures coordinating population and development are in line with finance, and staff training and facilities are strengthened in order to enable population and development to be properly coordinated and executed effectively.

It is important to understand that as family sizes increases, households tend to incur more debts with more interest in order to sustain the family. It can therefore be ascertained that, as the interest rate increases, households that are aimed at moving ahead in terms of growth would reduce their current spending on food in order to invest their money so as to earn a high-interest income that would guarantee them higher future consumption. Thus, such households would be looking forward to spending more on food at a subsequent time unless there is a shift in policy. This pattern of household expenditure on food explains the high incidence of poverty and high level of underdevelopment in Nigeria.

**Conclusion**

In Nigeria, the nature of development planning and policy analysis has changed remarkably since the early 1980s. A lot has to be done to fully realize the goal of full integration of population ***data*** in socioeconomic planning and reducing the impact of fertility differentials on household portfolio demand.

This process involves more than the adequacy of ***data***, and includes putting in place the required institutional arrangements to ascertain the interrelationship between population and capacity of the planning system. The National Planning Commission has a major role to play here, while other ***data***-producing agencies should co-operate with it to ensure that ***data*** is produced in good time. Furthermore, people should be educated on how to manage the implications of expenditures wisely, and limit monetary transactions on goods and services, because of the long-term implications. Much has to be done to reduce the impact of fertility differentials on household portfolio demand. This process, however, involves more than just reducing fertility levels within the economy, but also training experts to educate people on how to manage their expenditures wisely, and limit monetary transactions on goods and services, especially in situations where population dynamics are strong.

**Notes**

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[***Public trust in the Chinese police: The impact of ethnicity, class, and Hukou***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:6BNK-9K41-DY41-733G-00000-00&context=1516831)

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**ABSTRACT**

Under the shiny surface of continued rapid economic growth, China has become a country rife with discontent over social inequalities, providing a unique social laboratory for studying social divisions and public perceptions of the police. We extended the conflict perspectives developed in the West to China and became the first to simultaneously examine the effects of three most vital social stratification variables in China—ethnicity, social status, and hukou—on trust in the police. Using nationwide ***data***, we found that ethnic minorities showed the same or higher levels of trust than the Hans, rural registers held more favorable views than urban registers, and self-identified social status emerged as the most important concept associated with conflict theory in explaining Chinese trust in the police. Findings provided important theoretical and policy implications of social stratification and policing in a country of rapid modernization.

**FULL TEXT**

**Introduction**

Public trust in the police can influence the amount and type of interaction people have with the police, the level of support they show to the police, the degree of legitimacy they perceive about the police, and the extent of cooperation they render to the police. This important topic, although extensively examined in Western nations, particularly in the U.S. and UK, is understudied in non-Western, developing nations. Limiting research on criminal justice issues to Western developed nations, unfortunately, ignores the majority of people on the planet, leading to a myopic worldview of insularity and ethnocentrism (Lambert, Wu, Elechi, & Jiang, 2012). To address the concern, this study examines public evaluations of the police in China. We are particularly interested at testing whether conflict theory can be generalized to the Chinese criminal justice context and the implications of social stratifications for policing and police–community relations in a country of rapid modernization.

This study focuses on the impact of social divisions on Chinese trust in the police. When the Chinese Communist Party established the “new China” in 1949, one of the regime’s primary goals was to eliminate completely the antagonistic class relations that exist in capitalist societies. Decades later, however, not only has a classless society never been accomplished, but also social divisions have grown exponentially deeper since the 1980s. Under the shiny surface of continued rapid economic growth, China has become a country rife with discontent over the many inequalities related to social stratification, resulting in scattered riots and protests every day (Sun et al., 2013a). The public security apparatus, including both civil and militarized police forces, are frequently dispatched to the frontline to dispel rallies and quell riots, causing numerous confrontations between the police and the public (Sun & Wu, 2010; Wu, 2010).

Amid increasing tensions among broad swathes of society, today’s China provides a unique social laboratory for studying the relationship between social divisions and public perceptions of the police. In this study, we extend the conflict perspectives developed in the West to the Chinese context. We assess the influences of deepened social divisions not only along common social stratification factors of ethnicity and social status, but also by key China-specific conflict factors such as *hukou* (i.e. household registration).

Compared to past research on Chinese opinions on the police, this study represents several methodological and conceptual improvements. First, we analyze ***data*** from the most recent 2010 Chinese General Social ***Survey*** (CGSS), which generated a large-scale, random-sample dataset that includes ***survey*** responses from urban and rural areas in all Chinese provinces. This is one of the few nationwide research projects conducted using rigorous scientific methods by social scientists in China. This study’s sample thus is more representative and findings more generalizable, compared to previous research that depended primarily upon samples from a single or a few cities (e.g. Sun et al., 2012, 2013a, 2013b; Wu & Sun, 2009; Cao & Hou, 2001) or nonrandom student samples (Wu & Sun, 2010).

Second, the CGSS ***data*** allow us to examine simultaneously the effects of ethnicity, social status, and *hukou*, arguably three of the pivotal social-hierarchy variables that shape the experience of all Chinese. Race/ethnicity has been one of the most consistent predictors of public evaluations of the police in Western societies, with racial minorities displaying less favorable attitudes toward the police than their majority counterparts. Ethnicity, however, has rarely been investigated in studies on public perceptions of the police in China. Similarly, the effect of *hukou* has been largely missing in prior research. Including these vital social stratification variables in a model reflects the value of analyzing social identities around the notion of multiple positioning that the critical racial theory in Western literature has underscored (Fenton & Harriet, 2002).

Lastly, we take the initiative to conceptually classify Chinese ethnic minorities into two groups—critical minorities and assimilated minorities—when studying their trust in the police. Critical minorities consist of Tibetans and Uyghurs (a Turkic Muslim group), who are widely considered less integrated into the Chinese culture and are subject to greater governmental control and surveillance due to local separatism and ethnic unrest (Wu, 2010). Assimilated minorities are comprised of other ethnic minorities, such as Zhuang, Manchu, and Hui, who are highly assimilated into the dominant Han culture and/or constitute little concern for the authorities in terms of domestic security and stability. Such classification enables us to test whether variations in the degree of assimilation and experience in social control may lead the critical minorities to hold differential sentiments toward the police from those of the Han majorities and the submissive minorities.

**Theoretical framework and the Chinese context**

**Conflict perspectives**

Conflict theorists argue that the dominant groups in a society use the law and law enforcement to preserve a social order that can maximize the protection of their own interests and control those groups that are considered threatening and subordinate, including the poor and racial minorities, among others (Chambliss and Seidman, 1971). Two theoretical models derived from conflict theory, the sense-of-injustice model and the group-position model, can illustrate the effects of social structural characteristics, such as ethnicity, social status, and residence, on people’s attitudes toward the police.

The sense-of-injustice model postulates that public perceptions of the police are heavily influenced by feelings of being treated unjustly by governmental agencies including the police (Wu et al., 2009). Police responses to incidents vary by the location of the citizens in social space as measured by their race, social status, sex, age, and residential areas (Black, 1976). Extending this argument to China, one may speculate that some groups of the population, such as ethnic minorities, lower and working classes, and residents of less developed areas tend to display less favorable views of the police as they are more likely to be subject to coercive police actions and receive less police assistance, compared to their respective counterparts.

Also building upon the conflict tradition, the group-position model posits that group orientations toward social and political institutions come from a sense of group position that involves “group identity, out-group stereotyping, preferred group status, and perceived threat” (Bobo & Hutchings, 1996, p. 955). According to this perspective, factors such as race, social status, and residential status indicate important group positions. Members of the dominant group (i.e. the in-group) tend to share a sense of superiority, viewing members of the subordinate group (i.e. the out-group) as intrinsically different and alien as well as significant competitors for political and social prerogatives (Bobo & Tuan, 2006). Consequently, they are more likely to think positively of the police because they perceive legal authorities as protectors of their interests and superiority. In contrast, members of the subordinate group are more inclined to view the police negatively as they see legal institutions as means of controlling the out-group and maintaining the status quo. The two theoretical models are connected to and complement one another, forming a plausible framework for theorizing Chinese trust in the police.

**Police–community relations in transitional China**

China’s profound social and economic transformations since the late 1970s have created tremendous challenges to the traditional communitarian style of policing that relied heavily on public participation and extensive formal and informal social control networks. The crime prevention function of two unassailable pillars of government control, neighborhood committees and work units, has gradually weakened. China also has experienced a steady increase in crime rates and new types of offenses, such as financial fraud and drug trafficking (Brewer, Guelke, Hume, Moxon-Browne, & Wilford, 1996; Liang, 2014; Liu, 2006). To suppress crime, the government launched several waves of strike-hard campaigns during which criminal suspects were massively arrested, swiftly sentenced, and harshly punished. Although government officials have claimed success for the heavy-handed state response, the long-term effect of such strategies on crime is questionable.

As in many transitional societies, China’s robust economic growth has been accompanied by a deteriorating relationship between the police and citizens. Police–community relations have been particularly plagued by an unprofessional style of domestic policing that fails to meet such internationally accepted standards as human rights protection, transparency, and accountability (Sun et al., 2013a). The heart of the problem rests in the broad and virtually unrestrained power by the police and a lack of an independent, nonparty oversight system to effectively prevent and discipline police misconduct. With little judicial and public oversight, police-run detention centers, jails, and work camps have become the hubs of police brutality and corruption. As the Chinese society has become more modernized and wealthier, such unchecked power and abusive behaviors have increasingly alienated ordinary people from the police and undermined their perceptions of police legitimacy.

A rising rights consciousness in general and a surge of public resistance to police authority in particular have propelled numerous confrontations between the police and the people. The number of protests has escalated since the early 1990s, increasing 10-fold from 8700 in 1993 to 87,000 in 2005 (Perry, 2010). Although illegal land seizure by local officials is often the leading cause of public anger and social unrest, protests and litigations against the police triggered directly by corruption and abuse of power are common (O’Brien & Li, 2006). While most protests were civil, violent and even deadly conflicts were not unheard of in recent decades. Policing has become a risky job in China. The average of annual police deaths in the line of duty has skyrocketed from lower than 50 before 1978 to nearly 500 in 2004 (Tanner, 2004) and stayed at high levels between 2004 and 2007 (Wang, 2010). Adverse occupational experience may have a persisting impact on officers’ attitudes toward the citizenry, subsequently influencing police–community relations.

**Social stratification and trust in the police**

**Ethnicity**

Race/ethnicity has long been recognized as a critical stratification factor in influencing public perceptions of the police. In the United States, Blacks are frequently found to have less favorable attitudes toward the police than Whites (Brown & Benedict, 2002). Members of other minority groups, such as Hispanics and Asians, are sometimes found to occupy an in-between position on the vertical attitudinal scale with Blacks and Whites at the two ends of the scale, while other times shown to have similar or even more positive views of the police than Whites (Wu, 2014a; Buckler & Unnever, 2008; Lai et al., 2010; Schuck et al., 2008; Weitzer & Tuck, 1999).

There are 55 officially recognized ethnic minorities in China, making up 8.5% (114 million) of the total population according to the most recent Chinese ***census*** ***data*** (National Bureau of ***Statistics*** of China, 2011). Most of the minority people live in the south, west, and north of China, particularly in remote and mountainous areas where living conditions are harsh. In the post-1949 China, the government established five provincial-level autonomous regions in the areas that have a high concentration of one or more minority groups, presumably allowing greater autonomy and rights for ethnic minorities.

The government’s minority policies have been a mix of assimilation and pluralism. During Mao Zedong’s leadership, political and forceful integration was emphasized, leading to heightened ethnic antagonisms (Dreyer, 1993). Under Mao’s successor, Deng Xiaoping, more importance was placed on co-existence of ethnic groups with an underlying acceptance of pluralism. After the mid-1990s, regional ethnic autonomy became one of the most fundamental political principles of the nation, and there was a shift to economic and cultural integration (Lai, 2009). To promote ethnic relations and regional development, the government has provided economic, political, and social privileges to ethnic minorities, such as less tax, more governmental subsidies, relaxation of the one-child policy, and lower requirements in admission to schools, universities, and state and public work positions (E. Han, 2010).

Although economic reforms have lifted millions of ethnic minorities out of poverty, the minority areas have been chronically lagging behind in socioeconomic development. In 2003, the GDP per capita in ethnic minority areas was 57% of the national average and 40% of the eastern more developed areas. The relationship between the government and minority groups is not always smooth, especially for Tibetans and Uyghurs. Distrust of and hostility toward the central government persists in Tibet and Xinjiang, two autonomous regions with a majority population of ethnic minorities. These groups are critical of the authorities for an array of cultural, economic, and political reasons. For example, they are considered less assimilated into the Chinese culture than other minority groups. Both are border regions, far away from Beijing, and subject to external influences. The Dalai Lama in exile has become the spiritual leader for the Tibetan separatist movement. Given the theocratic nature of traditional Tibetan government where Dalai Lama was considered the God-king, most Tibetans regarded resistance to the Chinese rule as part of their religious faith (Dreyer, 1993). Similarly, the Uyghurs are inspired by radical Islam, Turkic nationalism, and the once-successful attempt at establishing their own republic in the early 20th century (Lai, 2009).

The government-sponsored migration of Hans to Tibet and Xinjiang has also caused interethnic friction. Compared to the Hans, many Uyghurs and Tibetans do not speak Mandarin, have less education, and consequently, have to work in jobs with lower pay and live in older and less well-off neighborhoods. Han people also hold some negative stereotypes about Uighurs and Tibetans, portraying them as aggressive, violent, and unreasonable (Hillman, 2006). Systematic racial discrimination, coupled with economic disparity, heightens the resentment of Tibetans and Uyghurs toward the Hans. In July 2009, one of the deadliest riots in recent years erupted in Urumqi, the capital city of Xinjiang. Uyghur demonstrators clashed with police forces and attacked innocent Han bystanders, followed by Hans’ retaliation, resulting in the deaths of 197 people (Millward, 2010).

In view of the interethnic relationships and the tightened governmental control over critical minorities in China, we expect ethnic minorities to have a greater sense of unequal treatment by the police and stronger perception that the police protect ethnic majorities’ privileges and resources. We thus hypothesize that *Tibetans and Uyghurs are least likely to trust the police, Hans are most likely to trust the police, and other minorities hold trust in between*.

**Social status**

A number of empirical studies in the West supported a link between social class and perceptions of the police. Most found that persons in the lower socioeconomic tiers hold more negative views of the police than the more affluent (e.g. Cao et al., 1996; Huang & Vaughn, 1996; Myrstol & Hawk-tourtelot, 2011; Sampson & Jeglum-Bartusch, 1998). A few studies, however, found no such significant effects of social status (Frank et al*.*, 1996; Henderson et al*.*, 1997; Sims et al*.*, 2002), and still others actually found that people with higher income and educational attainment viewed the police less positively than those with lower income and educational attainment (e.g. Murphy & Worrall, 1999; Weitzer & Tuch, 1999).

Deng Xiaoping, the Chinese leader who launched the open-door policy and economic reforms in 1978, mentioned several times that it is fine for some people to get rich before others. Some did and became superrich. China has 168 billionaires (in U.S. dollars) today, second only to the U.S. (*Forbes*, 2013). Beneath these superrich are wealthy party and state bureaucrats, their corporate partners, and private entrepreneurs, followed by a new middle class of public officials, businessmen, managers, professionals, and academics (Weil, 2008). At the bottom are hundreds of millions of people of the working class, particularly rural peasants and urban migrant workers who have the lowest class standing. Within two decades, China’s Gini coefficient has grown from .40 in 1993 to .47 in 2012, higher than the international warning line of .40 and the U.S. index of .45 (Central Intelligence Agency, 2012).

A widening class gap generates tensions between the socially advantaged and disadvantaged. Public discontent is especially acute over land and property, labor, and environment disputes. Class conflicts and popular grievances, inadequately addressed by China’s petition system, have led to widespread mass incidents in recent years, creating decreased social stability and increased police–citizen confrontations. In 2011, for instance, peasants in Wukan Village, Guangdong province, protested for months over local official corruption in land expropriation without proper compensation, and when a village negotiator died in police custody, vehement confrontations erupted between the villagers and the police, with villagers storming the local police station and expelling village officials. The police besieged the village, and provincial officials had to step in and remove corrupt officials.

Working at the frontline and frequently caught in the crossfire of social conflicts, the police tend to align with the interests and privileges of the “haves” rather than the “have-nots.” Both the sense-of-injustice and the group-positive perspectives suggest that people with a lower social status will have less trust in the police than wealthy people because they are more likely to be the subject of police control actions and question the police as serving the rich people’s interests rather than theirs. It is therefore hypothesized that *people with a higher social status have greater trust in the police than people with lower a social status*.

**Hukou**

One of China’s most serious social problems is the developmental disparity between rural and urban areas, which is thought to rise from state favoritism toward urban development and continued institutionalized discrimination against rural people through the *hukou* system (Whyte, 2010). The *hukou* system, which is instrumental in exercising governmental social control since the late 1950s, classifies the population into two separate castes, rural (***agricultural***) and urban (nonagricultural). The system not only contains detailed personal information such as name, date of birth, parents, spouse, education, and occupation, but also prescribes drastically different opportunities and treatment for rural and urban residents in their daily life. Urban life, for example, was highly subsidized, with better access to a host of benefits in housing, medical care, pensions, and hardship allowances.

In recognizing the wide cleavage between rural and urban China, the government has launched various policies since the 1990s in favor of rural areas. The majority of China’s rural areas, especially villages in the country’s interior, nevertheless still face serious obstacles to economic and social development (Whyte, 2010). Rural–urban income inequality has shown an upward trend since the late 1990s (Li & Luo, 2010), and the countryside continues to lag behind cities in access to education and health care (Hannum, Wang, & Adams, 2010). These gaps have fostered long-festering grievances among rural residents. Further, the confiscation of village land for commercial development without adequate consultation and compensation has especially raised rural discontent in recent years (O’Brien & Li, 2006). In addition, the rural police are usually poorly equipped or trained for disposing of large-scale protests (Sun & Wu, 2010). Ineffectiveness, coupled with lack of professionalism and accountability, contributed to numerous violent confrontations and chaotic situations, threatening rural stability.

Complicating matters further, the rapid economic development and loosened restriction on migration have led millions of peasants to migrate to cities for employment. Though they have been working and living in the cities for years, migrant workers are rigidly marked by the *hukou* system as forever “temporary” urban residents, who are taken advantage of for their cheap labor while being denied urban citizenship (D. Han, 2010). The lack of an urban *hukou* prohibits migrant workers and their children from receiving social welfare, such as housing, medical care, and education.

Urban life thus is extremely difficult for migrant workers. Official ***statistics*** indicate that migrant workers are heavily involved in the criminal justice system as both offenders and victims in such major migrant destination cities as Shanghai and Guangzhou (Xu, 2014). Scholars pointed out that the rates of crime by rural migrants are generally overestimated, whereas their victimization is frequently overlooked (Xu & Song, 2005). Migrant workers’ marginalized and even dangerous class status has made them primary targets of urban policing. Similar to racial profiling in the U.S., police control of migrant workers also involves discriminatory policing practices based on the physical look of people (D. Han, 2010). Considering the disadvantaged social position of rural residents and urban migrant workers, we hypothesize that *Chinese who have a rural hukou are less likely to trust the police than Chinese who have an urban hukou*.

In sum, despite economic prosperity and international standing, China remains a “high power distance” society, where an uneven distribution of power and weak public participation in government decision-making are commonly anticipated by the less powerful people (Hofstede, 2001). Ethnicity, social status, and *hukou* are three important social hierarchical variables in China. Unfortunately, although a growing number of studies has examined Chinese perceptions of the police in recent years (Sun et al., 2012, 2013a, 2013b; Wu, 2010, 2014b; Wu & Sun, 2009, 2010; Cao & Hou, 2001; Jiang et al., 2012; Lai et al., 2010), none has examined the impact of ethnicity, social status, and *hukou* simultaneously. This study aims to fill the void.

**Methodology**

***Data* and sample**

This study used ***data*** collected by the 2010 CGSS. The CGSS gathered a variety of information on Chinese people’s social demographics, labor market participation, social attitudes, and political attitudes and behavior, among others. Starting from 2003, it is the first continuous national social ***survey*** project and considered as one of the most respected scientific ***surveys*** about Chinese opinions and behaviors. The CGSS, with most of its funding from Renmin University of China (RUC), is designed and carried out by sociologists at RUC and other universities. The study population included households in all 31 provincial units (i.e. 22 provinces, 5 autonomous regions, and 4 municipalities) in mainland China.

Two subsamples were included in the 2010 study: the mandatory subsample and the nonmandatory subsample. The mandatory subsample was randomly selected from households in five top-ranked cities (i.e. Shanghai, Beijing, Guangzhou, Shenzhen, and Tianjin) with regards to economic development, educational level, and economic and political openness. The nonmandatory subsample was randomly generated from hundreds of urban districts and counties throughout the country. A total of 19 city districts and 31 counties were chosen to represent a diverse population in terms of population density, nonrural proportion of residents, and per capita GDP.

For each subsample, a sampling procedure involving a mixture of multistage cluster (area) sampling, stratified sampling, and systematic sampling was utilized. These techniques, compared to simple random sampling, have the advantages of improved sample representativeness and more efficient statistical estimates. First, for the mandatory subsample, 40 street districts were selected using the probability proportional to size (PPS) procedure and served as the primary sampling units (PSUs). Within each of the PSUs, two urban resident committees were chosen using the PPS procedure, serving as the secondary sampling units (SSUs). Then within each of the SSUs, 25 households were selected, using systematic sampling based on house numbers. Second, for the nonmandatory subsample, 100 PSUs were selected using the PPS procedure. Within each of the PSUs, four urban resident committees or village committees were selected to be the SSUs following the PPS procedure. Then within each of the SSUs, 25 household were selected, using systematic sampling method based on house numbers. Finally, one person aged 18 or above was randomly selected from each household to participate.

The whole sample included a total of 12,000 respondents, with 2000 from the mandatory subsample and 10,000 from the nonmandatory subsample. The sample has, to a great extent, captured the diversity of the Chinese population with respect to ethnicity, social status, and *hukou.*1 Face-to-face interviews were conducted with all participants. The ***survey*** was administered using Mandarin or a local dialect, increasing its acceptability among people who do not speak the official language. The response rate was 73.2%, and the missing value rate was 3.3%.

**Measures**

**Dependent variable**

The dependent variable, trust in the police, was indicated by a question asking “How much trust do you have in the police?” The response categories included “don’t trust at all,” “don’t trust to a certain extent,” “between trust and distrust,” “trust to a certain extent,” and “trust completely.” Although a single-item indicator may generate simplistic and misleading assessments of social phenomena, such approach is not uncommon in the literature (e.g. Author 2 et al., 2009; Cao, Lai, & Zhao, 2012; Ivković, 2008). Recent studies found that Chinese trust in the police was one-dimensional (Sun et al., 2013a, 2013b), suggesting that using a single-item measure is proper in assessing Chinese trust in the police.

As the dependent variable was an ordinal variable, ordered logistic regression was the foremost considered analytical procedure. We found, however, that the assumption of the parallel lines for ordered logistic regression was violated. Therefore, binary logistic regression was a preferred method. The dependent variable was recoded into a dummy variable with value 0 representing those who answered “between trust and distrust,” “don’t trust to a certain extent,” or “don’t trust at all” and value 1 representing those who reported “trust completely” or “trust to a certain extent.” We included the fence-sitters (i.e. respondents who reported “between trust and distrust”) in the distrust category because, for whatever reasons, they did not consider themselves as trustful of the police. Another consideration of combining them with those reporting distrustful of the police was to have a more conservative estimate of people’s trust in the police as those who do not trust the police are more likely to offer an ambiguous and socially desirable answer.

Meanwhile, we also conducted some sensitivity testing over the coding of the dependent variable. Specifically, we have (1) compared the samples with and without those fence-sitters and no significant differences were found between the values of the independent variables in those two samples and (2) conducted a separate set of ***data*** analyses with those who reported “between trust and distrust” deleted from the sample and found no significantly different results from what was found from the undeleted sample. Both sensitivity tests indicated that combining the groups of “between trust and distrust,” “don’t trust to a certain extent,” and “don’t trust at all” for analysis was appropriate.

**Independent variables**

Ethnicity, social status, and *hukou* were the independent variables. Ethnicity was measured using three dummy variables, indicating, respectively, Han people, critical minorities (i.e. Tibetans and Uyghurs), and assimilated minorities (i.e. all other minorities). Social status was measured with two items, signaling subjective social status at present and for the future. Respondents were told “In our society, some groups are at the higher levels while others are at the lower levels.” Then they were asked: Below is a scale from 1 to 10 with 1 representing the lowest level of social class and 10 the highest level of social class; which level are you at currently? Which level will you be at 10 years later?

The two items had a strong positive relationship (r = .73) and formed an additive scale (Cronbach’s α = .84). This subjective social status measure models after the MacArthur Scale of Subjective Social Status, which was found to be a more valid measure, compared to objective social status indicators, such as income, under many circumstances (Goldman, Cornman, & Chang, 2005). *Hukou* was a dummy variable with 0 indicating people with an urban *hukou* and 1 representing those with a rural *hukou*.

**Control variables**

Control variables included demographic characteristics, social trust, criminal justice/legal knowledge, and social attitudes and experience. Demographic characteristics consisted of gender,2 age, education, and religiousness. Gender was a dummy variable with 1 representing female. Age was a continuous variable measured in years. Education indicated respondents’ highest level of educational attainment, ranging from 1 (no education at all) to 13 (postgraduate education). Religiousness was coded as a dummy variable with 0 representing respondents who have no religious belief and 1 representing respondents who have religious belief.

Three social trust variables were constructed, including particularized trust, intermediate trust, and generalized trust, to reflect the radius and sensitiveness of such trust (Delhey, Newton, & Welzel, 2011). Political scientists have posited that social trust is positively related to confidence in governmental institutions (Brehm & Rahn, 1997; Putnam, 2000). With the police being an integral component of the political system, a logical extension of this argument is that citizens’ assessments of the trustworthiness of the police are also influenced by their social trust. Recent evidence supports a linkage between social trust and public assessments of the police (Sun et al., 2012, 2013b; Van Craen, 2013). To measure social trust, respondents were asked about their degrees of trust in different groups of individuals: family members, relatives, friends, colleagues, classmates, and hometown fellows (1 = “don’t trust at all”; 5 = “trust completely”). Particularized trust was measured based on respondent’s levels of trust in family members. Intermediate trust was an additive scale summing up respondents’ trust in relatives, friends, colleagues, classmates, and hometown fellows (Cronbach’s α = .81). Principal component analysis (PCA) with Varimax rotation showed that all items loaded onto one single factor with factor loadings ranging from .65 to .81. Respondents were also asked to what degree they agreed that most of the people in society can be trusted (1 = strongly disagree; 5 = strongly agree). Generalized trust reflected people’s trust in unfamiliar others or strangers.

The third group of variables was comprised of three variables measuring people’s knowledge of the criminal justice system, legal procedure, and the law. Knowledge about the practices of law and criminal justice may be related to people’s trust in the criminal justice system as Quinney (1975, p. 176) noted that “Reaction to all that is associated with crime rests initially upon knowledge about crime.” Nonetheless, past research on Chinese evaluations of the police has yet to assess such a linkage. On one hand, we may expect that people with better knowledgeable about law and criminal justice may be more comfortable interacting with the police and have more confidence in communicating effectively with the police, which can lead to higher trust in the police. Alternatively, it is also possible that people who know more about criminal justice have more comprehensive understanding of the system, including its weaknesses and problems, and thus are more critical about the police. To capture knowledge, respondents were asked to what extent they understand “functions of the police,” “functions of the procuratorate,” “functions of the court,” “how to hire a lawyer,” “how to apply for legal assistance,” “how to file a lawsuit,” and “laws.” Response categories ranged from “don’t understand at all” (1) to “completely understand” (5), with a greater value indicating better knowledge. PCA revealed that these seven items loaded onto three factors, respectively, indicating respondents’ knowledge of the criminal justice system (i.e. the police, procuratorate, and court items; Cronbach’s α = .94), knowledge of legal proceedings (lawyers, legal assistance, and lawsuits; Cronbach’s α = .93), and lastly, basic knowledge of the law.

The last group included four social attitudinal and experiential variables. Social attitudes and experience, including perceived social conflicts, rule obedience, and experience with mass incidents and injustice, may also shape individuals’ trust in the police. It is reasonable to argue that people who follow the laws and conventional rules are less likely to have negative encounters with the police and thus have more positive views toward the police. It is also expected that people who perceive the society as more harmonious and conflict free are more satisfied with the way government and law enforcement agencies operate. Meanwhile, experience with injustice and participating in mass incidents is likely to contribute to negative sentiments toward the police for two considerations. First, the police are often dispatched to control those mass incidents where negative or even violent confrontations between the police and the public occur frequently. Second, even when such experience does not involve direct contact with the police, citizens who have serious grievances or who participated in mass incidents are inclined to hold resentment toward government agencies in general, which may have a carryover effect on their perceptions of the police.

Rule obedience denoted people’s tendency to obey rules and laws. Respondents were asked how often they obeyed “traffic rules,” “workplace rules,” “laws and regulations,” and “organizational rules and disciplines” (1 = never; 5 = always). These items formed an additive scale with a reasonable level of internal consistency (Cronbach’s α = .87). The items loaded onto one factor with factor loadings ranging from .84 to .88. A second variable, perceived social conflict, was constructed based on the addition of four items. Respondents were asked In your opinion, what is the situation of conflict between the following social groups? (1) the poor and the rich; (2) the working class and the middle class; (3) workers and managers; and (4) lower levels of social class and higher levels of social class.

Response options included “no conflicts at all,” “not too serious,” “kind of serious,” “serious to a large extent,” and “very serious” with greater values representing higher levels of perceived social conflict. The scale had a high degree of internal consistency (Cronbach’s α = .86) and the items loaded onto a single factor with factor loadings from .79 to .88. The last two variables tapped into people’s experience with mass incidents and injustice, which may shape their perceptions of government officials, particularly the police. Respondents were asked: “In real life, we often see some mass incidents or actions. During the past three years, has any such incident occurred around you?” (0 = no; 1 = yes). Respondents were also asked “During the past year, have you encountered any unjust treatment by the government or public officials?” (0 = no; 1 = yes).

Table 1 displays the descriptive ***statistics*** for all the variables. Possible multicollinearity problems were checked by examining the matrix of two-variable correlations among the independent variables. The highest correlations were between three of the control variables: knowledge of the criminal justice system, legal proceedings, and the law (.50 < r < .70). As factor analysis indicated that these were distinct factors, we kept them as separate. We also examined the variance inflation factors, all of which were below 2.3, much lower than the generally accepted limit of 10. Multicollinearity thus was not a concern. Table 1.Descriptive ***statistics*** for variables.

| **Variables** | **Min** | **Max** | **Mean** | **S.D.** | **N** |
| --- | --- | --- | --- | --- | --- |
| Dependent variable |  |  |  |  |  |
| Trust in police | 0 | 1 | .74 | .44 | 11,708 |
| Independent and control variables |  |  |  |  |  |
| Ethnicity |  |  |  |  |  |
| Han | 0 | 1 | .91 | .29 | 11,758 |
| Critical minorities | 0 | 1 | .02 | .12 | 11,758 |
| Assimilated minorities | 0 | 1 | .07 | .27 | 11,758 |
| Social status | 2 | 20 | 9.23 | 3.57 | 11,495 |
| Rural hukou | 0 | 1 | .51 | .50 | 11,778 |
| Demographics |  |  |  |  |  |
| Female | 0 | 1 | .52 | .50 | 11,779 |
| Age | 18 | 96 | 47.31 | 15.68 | 11,779 |
| Education | 1 | 13 | 4.84 | 2.98 | 11,757 |
| Religiousness | 0 | 1 | .13 | .34 | 11,751 |
| Social trust |  |  |  |  |  |
| Particularized trust | 1 | 5 | 4.81 | .47 | 11,761 |
| Intermediate trust | 5 | 25 | 18.62 | 2.94 | 11,001 |
| Generalized trust | 1 | 5 | 3.50 | 1.09 | 11,761 |
| Criminal justice and legal knowledge |  |  |  |  |  |
| Knowledge on criminal justice | 3 | 15 | 8.75 | 3.32 | 11,738 |
| Knowledge on legal proceedings | 3 | 15 | 6.82 | 3.29 | 11,687 |
| Knowledge on law | 1 | 5 | 3.09 | 1.15 | 11,761 |
| Social attitudes and experience |  |  |  |  |  |
| Rule obedience | 4 | 20 | 18.36 | 2.08 | 11,520 |
| Perceived social conflicts | 4 | 20 | 12.99 | 3.54 | 11,388 |
| Experience with mass incidents | 0 | 1 | .12 | .33 | 11,709 |
| Experience with injustice | 0 | 1 | .09 | .28 | 11,699 |

**Results**

Table 2 presents the binary logistic regression results of Chinese trust in the police. It is found that critical minorities (i.e. Tibetans and Uyghurs) held similar levels of trust in the police to Hans, whereas assimilated minorities expressed higher levels of trust than Hans. Using the Tibetan and Uyghur respondents as the reference group, no significant difference was found in the levels of trust in the police between the critical and noncritical minority respondents. These findings were contradictory to our hypotheses. Table 2.Binary logistic regression of Chinese trust in the police.

| **Variables** | **B** | **SE** | **OR** |
| --- | --- | --- | --- |
| Ethnicity |  |  |  |
| Critical minorities | .36 | .30 | 1.44 |
| Assimilated minorities | .36\*\*\* | .10 | 1.43 |
| Social status | .02\*\*\* | .01 | 1.02 |
| Rural hukou | .41\*\*\* | .06 | 1.51 |
| Demographics |  |  |  |
| Female | .12\*\* | .05 | 1.13 |
| Age | .01\*\*\* | .00 | 1.01 |
| Education | –.06\*\*\* | .01 | .94 |
| Religiousness | –.19\*\* | .08 | .82 |
| Social trust |  |  |  |
| Particularized trust | .01 | .05 | 1.01 |
| Intermediate trust | .14\*\*\* | .01 | 1.16 |
| Generalized trust | .19\*\*\* | .02 | 1.21 |
| Criminal justice/legal knowledge |  |  |  |
| Knowledge on criminal justice | .06\*\*\* | .01 | 1.06 |
| Knowledge on legal proceedings | –.03\*\* | .01 | .97 |
| Knowledge on law | –.01 | .03 | .99 |
| Social attitudes and experience |  |  |  |
| Rule obedience | .03\* | .01 | 1.03 |
| Perceived social conflicts | –.05\*\*\* | .01 | .95 |
| Experience with mass incidents | –.74\*\*\* | .07 | .48 |
| Experience with injustice | –.73\*\*\* | .08 | .48 |
| N | 10,240 |  |  |
| Model ÷2 | 1288.99\*\*\* |  |  |
| Nagelkerke R2 | .17 |  |  |

\**p* < .05; \*\**p* < .01; \*\*\**p* < .001.

Social status was positively related to the odds of expressing trust in the police. In other words, people with higher perceived social status were more likely to trust the police, which was consistent with our hypothesis. Contrary to the expectation, having a rural *hukou* was associated with greater likelihoods of trust in the police. The odds of respondents with a rural *hukou* to report trust in the police were 1.5 times the odds for respondents with an urban *hukou*.

A number of control variables exerted significant effects on Chinese trust in the police. Female and older citizens were more inclined to trust the police, compared to their male and younger counterparts. Both educational attainment and religiousness were negatively related to trust in the police, meaning that people with higher levels of education and people with religious belief have lower odds of trust in the police. With respect to social trust, while trust in family members did not have any impact on one’s trust in the police, both intermediate and generalized trust were positively related to police trustworthiness. Regarding knowledge of criminal justice and the law, whereas knowledge on the criminal justice system and legal proceedings were associated with greater odds of trust in the police, knowledge of the law did not influence Chinese trust in the police. Concerning the attitudinal and experiential variables, degree of rule obedience was positively connected to the odds of trust in the police, while perceived degree of social conflicts was negatively related to the odds of trust in the police. Finally, having witnessed a mass incident or encountered injustice had significant adverse effects on Chinese trust in the police.

**Discussion**

The main purpose of this study is to examine the effects of ethnicity, social status, and *hukou* on Chinese trust in the police. Relying on the conflict theory tradition, we speculated that members of the dominant groups in China, such as the ethnic majority, people of higher social statuses, and residents with an urban *hukou*, would have greater trust in the police than members of the subordinate groups, such as ethnic minorities, lower social statuses, and residents with a rural *hukou*. The analysis results verified some of these expectations and falsified others.

First, contradictory to our expectations, ethnic minorities showed the same or even higher levels of trust in the police than the Hans. Two critical minority groups, Tibetans and Uyghurs, reported similar levels of trust in the police to the Hans, and assimilated minority groups expressed greater trust than the Hans. Studies conducted in the U.S. assessing public opinions on legal authorities commonly found a “racial gradient,” where Whites showed most favorable attitudes, Blacks the least favorable, and Latina/os somewhere in between. Such a racial/ethnic continuum does not appear to be found in China.

The higher levels of trust held by assimilated minorities may be attributed to a faster economic growth in many areas that assimilated minorities live in and the consequent improvement in the quality of life and opportunities for these minorities, who tended to have a very disadvantaged past (Lai, 2009). Indeed, we found through additional analysis that the attitudinal difference between assimilated minorities and the Hans was most apparent among those who have a higher perceived social status. Other sociopolitical factors, such as administrative autonomy, legislative over-representation, and economic and educational privileges, may also cultivate positive views toward the authorities, including the police, among assimilated minorities.

Our finding that critical minorities and the Han people are indistinguishable in their perceptions of police trustworthiness deserves further elaboration. It is possible that the Han people, compared to their minority counterparts, are more likely to be critical citizens, who are less trustful of and less deferential to authorities. In the postreform era of China, there are a growing number of critical citizens. While the country remains an autocratic state, a sustained period of economic growth has cultivated stronger rights consciousness and political demands among many, a phenomenon similar to the rising tide of popular discontent and decline of political trust commonly found in Western democracies since the early 1990s (Norris, 1999). It is possible that the Han people may have higher expectations of the criminal justice system, a wider perceived gap between the ideal of criminal justice and how it actually performs, and accordingly are more likely to be critical citizens who hold skeptical views on legal authorities, including the police. Alternatively, it is possible that critical minorities hold similarly high levels of trust in the police because they, just like other minorities, receive preferential treatments from the Chinese government and thus hold positive views on the police, a highly visible political institution. Favored treatment, such as exemption from the One-Child Policy, overrepresentation in the National People’s Congress and governments at the provincial and prefectural levels, and preferential policies for aiding economic development in Xinjiang and Tibet, may promote favorable attitudes toward regulatory authorities among local minorities, most of whom are not separatists.

Second, in line with conventional Western evidence and our hypothesis, social status was positively associated with Chinese trust in the police. People who considered themselves in the higher levels of social status currently and in the future were more likely to be trustful of the police. This result aligns with what previous research found that Chinese who have higher levels of perceived family SES, social status, and power and influence were more inclined to think positively of the police (Sun et al., 2013b; Wu & Sun, 2009). Self-identified social status, thus, has emerged as the most important concept associated with conflict theory in explaining Chinese perceptions of the police.

Third, rural registers held more favorable views toward the police than urban registers, contrary to our hypothesis. While some previous research found rural residents tend to display lower, rather than higher, levels of satisfaction with the police (Sun et al., 2013b; Michelson & Reed, 2011), others have reported greater trust among people with a rural *hukou* than urban *hukou*. Wang (2010), for example, found that among migrant workers, urbanites, and villagers, migrant workers were the most optimistic about the future, while urbanites were the most critical ones about income inequality, with villagers in between. Similarly, Sun and colleagues (2013a) found that migrant workers expressed greater trust in the police than urban dwellers and rural farmers. These findings call for more research into rural–urban distinction in evaluating legal authorities. They also suggest a need for reconsidering the adequacy of the group-position and sense-of-injustice theses: A disadvantaged group position does not necessarily lead to distrust of the authorities, particularly when people willingly or unwillingly accept such social positions and adjust expectations accordingly. Indeed, “feelings of distributive injustice are not well mapped by assuming that low status and disadvantage automatically produce anger and discontent” (Han & Whyte, 2009, p. 209).

The urbanites’ critical evaluations of the police are also interesting. Although police in cities tend to be better trained and act more professionally than their rural counterparts, urbanites, possibly due to their higher expectations of government institutional performance, stronger rights consciousness, and greater likelihoods to live in an environment surrounded by newly rich (and superrich) and powerful people (Han & Whyte, 2009), may be more likely to develop greater senses of injustice and lower trust in the police.

Finally, a few variables that eluded prior research were found significant predictors of Chinese assessments of the police. For instance, results revealed that knowledge of mass incidents that occurred nearby significantly reduced one’s trust in the police. Clearly, the mobilization of police forces to control riots, demonstrations, and protests increased the possibility of direct confrontations between the police and the public, undermining public satisfaction. Making things even worse is that police misconduct accounted for more than 20% of such incidents (*Legal Daily*, 2012, December 17). In addition, we found that perceiving greater degrees of conflict between social groups was linked to lower trust in the police, suggesting a potentially crucial mechanism that links objective conflict to trust via subjective views of conflict.

Despite its contributions, this study has two limitations. First, the effects of some theoretically relevant variables on public evaluations of the police were not examined in this study due to ***data*** constraint. Recent studies, for example, have shown that expressive concerns, instrumental concerns, and media exposure are important predictors of Chinese perceptions of police trustworthiness (e.g. Sun et al., 2013a, 2013b). If possible, future research should incorporate such variables as perceived law and order, quality of life, victimization, and exposure to negative reports on the police, into analysis.

Second, although social science research is increasingly common and accepted in China today, we cannot rule out the possibility of “social desirability bias,” particularly in a collective culture, where some respondents may choose to answer questions in a socially desirable manner. There may also be an unknown amount of “political desirability bias,” where some people may not fully trust that the ***survey*** could be anonymous and without repercussion, and thus be reluctant to express negative comments on legal authorities. Minority groups, for example, may want to avoid calling attention to their political views and activities, and when the interviewers are Han, some may prefer to offer answers that are considered the standard responses of the Hans (Hoddie, 2008). Future research should consider using measures of socially desirable responding to assess whether these issues are truly a concern among socially disadvantaged groups.

Theoretically, our study found evidence that shows both congruence and incongruence with conventional Western wisdom regarding factors influencing public opinion on the police. By and large, conflict theory can only be applied to the Chinese context to a certain extent. While the positive influence of social status frequently identified in the Western literature was also evident among the Chinese respondents, the effects of two other important stratification variables, ethnicity and household registration, did not influence Chinese trust in the police in a direction that conflict theory would expect. Results seemed to suggest that China is less divided by ethnicity and *hukou*, but more by a broad concept of social status that entails mainly subjective perceptions of one’s own social status and associated expectations. It is possible that people’s self-perceived group positions are not always consistent with their objective statuses in the society; it is also possible that people may be well aware of their group positions yet such awareness does not influence their trust in the police in a collective culture as much as it does in the West. These possibilities encourage future studies in diverse research locations beyond typical (primarily Western) sociocultural settings.

Some final thoughts on policy implications of this study are in order. Our findings reveal the surface of critical citizens in China who are more likely to be urban residents and ethnic majorities. Thus, the legitimacy of the Chinese governance, if exemplified by public trust in the police, would face greater challenges from the dominating, higher social status urban dwellers than from the marginalized, lower social status peasants and minorities. A heavy-handed state control over these less advantaged groups, thus, is misleading. Improved rights consciousness and political skepticism are healthy products of modernization and democratization that should be recognized, and welcomed, by the government. The ability to enhance public perceptions of police legitimacy and trustworthiness eventually hinges on improved state legitimacy in general and high moral and behavioral standards among police officers in particular.

**Notes**

1Migrant workers were also included in the sample of the CGSS. As a household ***survey*** with its sample drawn from lists of addresses, the CGSS included local residents as well as migrant workers. In fact, previous research has used the CGSS ***data*** to examine specific topics regarding the experience of migrant workers. For example, Li and Tian (2011) studied the social attitudes and behavioral choices of migrant workers (see Li & Tian, 2011, The New Generation Migrant Workers: Social Attitudes and Behavioral Choices, *Chinese Journal of Sociology*, *31*, 1–23.).; 2We did not highlight gender in this study because existing studies found no effect of gender on Chinese perceptions of the police (Cao & Hou, 2001; Jiang et al., 2012; Sun et al., 2013a, 2013b; Wu & Sun, 2009, 2010). Similarly, most studies conducted in the West found no effects of gender, and the remaining studies found mixed effects of gender, in assessing public views of the police (see Brown & Benedict, 2002 for a summary). Because of its weak and inconsistent impact, gender, without doubt an important social stratification variable by itself, was treated as one of the control variables in this study.

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[***Perceived quality of private education and fears of stratification: Investigating the propositions of human capital theory by exploring the case of Colombia***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:6BNK-7DJ1-DY41-73KH-00000-00&context=1516831)

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**ABSTRACT**

The purpose of this paper is to discuss the recent developments in the higher education system of Colombia in order to illustrate how these encourage stratification between (types of) universities and their students. We do so by discussing propositions generated by human capital theory and apply them to the experiences of students and graduates from Colombian universities.

We conducted a ***survey*** (n = 700) amongst graduate and undergraduate students at 12 low-fee private universities. Four interviews with (former) students served as an illustration. The majority of undergraduate students perceived the quality of their education as poor and wanted to attend another university. Both students and graduates expressed uncertainty about finding a job and anticipated difficulties as they felt they lacked essential skills. Due to relatively unhindered privatization and marketization of the columbian higher education sector, low-quality private provision in Colombia demonstrates this structural inequality.

Our study shows that investing in higher education does not always correlate positively with skills gained or future income, thereby revealing the necessity to use human capital theory in a more nuanced manner.

**FULL TEXT**

**Introduction**

The advancement of science and technology (Miller, 2012) is a major stimulator in developing countries. In addition to foreign investment and the stimulation of business in a globalizing world, education is an important factor. Innovation and competitiveness allow countries to perform well in international markets (e.g. Gacel-Ávila, 2012), while the incomes of people rise as a return on investment in education. The improvement in productivity and economic growth is expected to enhance social welfare as a whole.

A growing demand for higher education (HE) is a global trend and more acute in developing countries. We chose to focus primarily on the situation in Colombia. However, these phenomena are common in many developing countries, as shown in the later section “The higher education system in Colombia”.

Because HE in Latin America remains relatively under-researched (Berry and Taylor, 2014), we will discuss the Colombian HE system to illustrate that recent developments in this system reinforce inequality instead of diminishing them. We will show that the cost of enrolling at a university and the expected rewards after graduating differ significantly between institutions. There are a few expensive private HE institutions (HEIs) with recognized levels of quality, and a large number of private HE institutions in which the fees are very low, but where the quality of education seems to be quite poor. The fees charged by the public universities depend on the socio-economic situation of the students, as well as their abilities.

Graduate and undergraduate students expressed fears and uncertainties that appear to contradict several basic assumptions taken for granted in human capital theory (HCT). HCT associates investment in HE with positive future returns in the form of higher incomes. However, when taking the quality of education into account, some of its postulates are difficult to sustain. More years spent in education and, in particular, HE does not necessarily lead to higher salaries or other rewards.

Our investigations are based on a ***survey*** of 500 undergraduates and 200 graduates. In addition, four interviews with a current student and three former students of an elite university were held to serve as an illustration of our findings. This paper examines how current and former students perceive the quality of HE provided by inexpensive universities. Our findings reveal a number of difficulties faced by both graduate and undergraduate students when entering the labour market. They face a number of challenges in HE and in their future earning potential, social integration and discrimination. When the quality of education is taken into account, graduates from low-fee universities find it harder to find employment and, if they do, they expect to be paid less and are more likely to be underemployed, because of social and labour market discrimination.

The assumptions made by the traditional HCT do not reflect these problems, which are experienced by students and graduates from a number of low-quality, low-fee institutions. Our hypothesis, therefore, is that investments in HE do not always translate into positive returns, especially for low-income families who invest their scarce resources in HE so that their offspring may attend low-fee private universities.

We continue now with an overview of the basic assumptions of HCT. The subsequent sections “The HE system in Colombia” and “Some considerations on the quality HE in Colombia” deal with the HE system in Colombia and the returns on this investment. Our empirical evidence is presented in the section “Findings”. The paper ends with the discussion and conclusions.

**Human capital theory: basic assumptions against a more nuanced view**

HCT asserts that if individuals make a variety of investments in education and practice through formal education and on-the-job training, they will be eventually rewarded. Human capital is seen as a “stock of knowledge and characteristics of the worker, that contributes to his or her productivity, including schooling” (Acemoglu and Autor, 2011: 3). Schooling or education enhances their marketable skills and capabilities that in turn boost future incomes through positive rates of returns. To Ishikawa and Ryan (2002), for example, the earnings of an individual are determined predominantly by their stock of human capital. Thus additional years of schooling are associated with future higher earnings. Although health and nutrition are also important components of human capital, investments in education are related to monetary incentives. In this regard, education is often seen as the main form of human capital (Sweetland, 1996) that acts on at least two levels. Becker et al. (1990) likewise find that investments in education not only increase skills acquired through knowledge at a micro level, as a result of which the individuals gain future benefits in the form of higher wages, but also at a macro level, because education can improve productivity, foster innovation and stimulate economic growth, as affirmed by Nelson and Phelps (1966), Bashir et al. (2012). For the OECD (2012) and the European Commission (2013), investment in education is seen as a way to improve social welfare. This positive correlation between education (schooling) and earnings is well established in the empirical literature. For example, Tamasauskiene and Poteliene (2013: 198), assert that “…better educated individuals suffer less unemployment, work in more prestigious occupations and have more of other social returns like honour and status than their less well-educated counterparts”.

A number of authors have established a body of principles that frame HCT. Mincer (1957, 1974) found disparities of earnings and incomes within broad population groups classified by educational status. The causes of the differences in personal income distribution are attributed to dissimilarities in formal schooling and experience provided by on-the-job training. Schultz (1961), for example, stated that expenditure on education has accounted for the most remarkable rise in real earnings per worker. This form of capital improves individual well-being and yields a positive rate of return on the investment. Disparities in earnings are attributable to variations in health and education but are mainly the result of differences in investment in schooling. Becker (1962, 1964) established a relation between investments in human capital and schooling on the distribution of income and future real income. Finally, Becker and Chiswicks (1966) developed an alternative approach to calculating rates of return from human capital, in order to understand the determinants of the distribution of earnings.

Some studies, nevertheless, disagree with aspects of this basic theory. For instance, Nelson and Phelps (1966) emphasized human capital as the ability to acquire formal education, but coupled with people's ability to adapt to changing environments. To Spence (1973), observable measures of human capital are a sign of skills that are especially useful in the production process. Bowles and Gintis (1976) stressed the ability of individuals to work in organizations, adjusting to life in capitalist societies. The main work of the school should be teaching the correct ideology and preparing people for real life. Gardner (1993) pointed to a multiple intelligence perspective, rather than considering human capital as a one-dimensional type of skill.

There have been a limited number of studies up to now that have described a relationship between variations in education quality (especially in HE) and the dispersion of graduates' future earnings. This point was stressed by James et al. (1989: 247) who found that even while there is “… a voluminous literature on returns to quality in higher education, and the determinants of quality at primary and secondary schools, it is surprising how little work has been done on the causes and consequences of college quality …”. More recently, Zhang and Thomas (2005: 262) pointed out that, HCT provides perspectives to interpret the effect of college quality but does not suggest the magnitude of such an effect. However, considering the increasing gap between the costs of a college among colleges of varying quality, we expect that college quality has a significant effect on graduates' earnings if larger investments in human capital lead to higher income.Kinsler and Pavan (2011) and Carnoy et al. (2012) produced similar findings in the HE sector. Winters (2013) demonstrated the absence of perceived quality of HE in more recent research in HCT.

We presume that perceived HE quality has an impact on the future economic status of graduates. For Zhang and Thomas (2005) and the OECD (2012), the dynamics of the demand for tertiary education have led to a massive expansion of HE in the US and in Europe, as well as in developing countries, but this has also resulted in a proliferation of HEIs and extraordinary segmentation, differentiation and stratification of HE. Romo de la Rosa (2007) discussed the expansion of private academic institutions in the US and Latin America, while Castillo (2013) makes a specific reference to Colombia.

The work by Acemoglu and Autor (2011) considered schooling as the most observable component of human capital investment, despite involving a relatively small fraction of it. These authors take the differences between school quality into account, which consists of teacher–pupil ratios, per-pupil spending, the length of the school year and the educational quality of the teachers. They note that empirical ***data*** on these components is lacking. Therefore, we think that discussions around HCT deserve a more nuanced approach; they should go beyond the dichotomy of college versus non-college graduates or the average number of years of schooling, and equal weight should be put on education quality. Given the differentiation among HEIs, graduates are not a homogeneous group. Instead, there is a lot of diversity between graduate students, because of social perceptions of substantial differences in the quality of HEIs and the difficulties some graduates experience in entering the labour market, due to difficulties finding a job and discrimination. For some researchers, the quality of the education is an element in the construction of human capital and thus has an important effect on the earnings of graduates (Behrman and Birdsall, 1983; Ehremberg, 2000; Solmon, 1975; Thomas, 2003; Weisbroad and Karpoff, 1968), even though its influence is not always incorporated into the human capital analysis framework.

The importance of political context as a crucial factor is discussed in two studies by Van der Merwe (2010) and Molla (2014) on HCT in two African countries. They demonstrate that the traditional assumptions formulated by HCT do not hold in a neoliberal discourse. Van der Merwe (2010) carried out a case study in the South African HE system and discovered affirmation of the HCT proposition that individuals regard HE as an investment, or a “risk versus return” prospect. His study shows that the traditional HCT relies on improbable assumptions about human behaviour to model educational choice. Despite a very different HE system in Ethiopia, it is interesting to note that a study by Molla (2014) illustrates how HE reforms typically endorse neo-liberal policy agendas. His study demonstrates how these reforms affected the social equity both at discursive and policy level. While the problem of inequality is considered as a lack of access and a barrier to the formation of human capital, Molla reveals that the strive for greater efficiency and cost reduction are not consistent with so-called equity instruments for marginalized members of society. In other words, a broader social justice perspective is required to stimulate the provision of equity in terms of participation and successful completion of HE studies.

As HE expanded and became stratified, finer differentiation among graduates has meant that quality matters and plays an important role in graduate earnings (Zhang, 2005a). College quality has a statistically significant effect on graduate earnings, as shown by Thomas (2003), Hanushek and Wösmann (2007) and Suhonen (2014). The question that arises is how to measure the quality of teaching at universities. Researchers have demonstrated a variety of empirical results (Zhang, 2005b). Diverse measurements of HEI quality also affect the average cost of attending institutions of varying quality, creating stratification and differentiation or a premium on future earnings (Hersch, 2014)..

As the quality of education between universities is *dissimilar*, so are the costs of enrolment and graduate incomes. If any returns on these investments can be expected, they will likely diverge too. Low costs of enrolment could generally be linked with poor quality HEIs and low future earnings. So the returns on this investment will not amount to that which was hoped for, even though HCT presupposes this. The relationship between investments in HE, the cost of student fees at undergraduate level and the rate of return on this investment at some private universities, especially those with inexpensive fees in the Colombian case, deserve further investigation.

Publications currently available on HCT quite often discuss education and schooling in general, while the studies in HE are often economically focussed and refer to various forms of capital, such as social or cultural capital. Davies et al. (2014) discuss an integrated model of participation in HE in England, and show that social and economic factors are treated as complementary rather than competing, whilst Perna et al. (2014) present a typology to promote human capital development in international scholarship programs. A study by Callejo-Pérez et al. (2011) has quite a narrow focus within HE, as they discuss the added value of the doctorate in terms of intellectual capital.

We will use our ***data*** to explain why some of the basic assumptions behind HCT when considered within a broader context do not hold, and how and why the perceived quality of education should be taken into account, based on the experiences and opinions of students and graduates from these lower-fee universities.

**The higher education system in Colombia**

Colombia is a South American country with a land area of 1.14 million km2 and 47 million inhabitants. According to the National Administrative Department of ***Statistics***, the average per capita income in 2013 was €4158.

For the World Bank (2014), Colombia is an upper-middle-income developing country in which HE must play a role in economic growth, given its relation to research, innovation, competitiveness and knowledge. As the European Commission (2013) pointed out, education “…plays a crucial role in individual and societal advancement; and, with its impact on innovation and research, it provides the highly skilled human capital that knowledge-based economies need to generate growth and prosperity …” (p. 3). Investing in education brings economic incentives for individuals (Mincer, 1974; Solow, 1956). The wellbeing of people is linked to education through the increase in personal incomes of graduates (Misas, 2004) (OECD, 2012). In Colombia, since the 1992 Act 30 of 28 December 1992, by which the public service of higher education is organized in public and private HEIs. These institutions are officially recognized as the providers of this public service, which is organized into undergraduate and graduate levels.

In 2014, according to the National Ministry of Education, the public sector accounted for 52.4% of the enrolment into HE (Ministry of Education, 2014). Colombian HEIs are classified into four levels: 1) professional technical institutions; 2) technological institutions; 3) university institutions; and 4) universities. The first two provide vocational training, which involves activities that develop skills for various trades and occupations. They provide training courses, and successful students are credited with the title of technician and senior technician, respectively. These two categories of education are not exempt from criticism, as they focus on lower-income groups and there is a social perception that they offer second-class education, free of charge and targeted at lower-income individuals. It is equivalent to the vocational education and training recognized in other countries.

University institutions represent the third level. They also contribute to educating (senior) technicians, but additionally provide professional vocational programs. When a student finishes a masters' degree, he or she becomes a professional in economics, medicine, etc. Finally, universities represent the highest level of HEIs. They provide undergraduate HE, MSc and PhD programs. Commonly, the last two categories or levels are referred to as university programs.

There were 4,354,649 young people aged 17–21 in Colombia in 2013. Of this number 1,983,421 were enrolled in HE (Ministry of Education, 2014), of which 32.7% were enrolled at professional technical institutions and technological institutions, and 61.4% were enrolled at universities (See Table 1). Table 1.Total enrollment by level of education in all HE institutions, 2013.

| **2013** |  |  |
| --- | --- | --- |
| Professional technical | 83,483 | 4.0% |
| Technology | 604,410 | 28.7% |
| University | 1,295,528 | 61.4% |
| Specialization | 82,515 | 3.9% |
| Masters | 39,488 | 1.9% |
| PhD | 3800 | 0.2% |
| Total | 1,958,429 | 100.0% |

Source: Ministerio de Educación Nacional.Table 2.Major higher education institutions, 2012.

|  | **Nature** | **Public** | **Private** | **Special regime** | **Total** |
| --- | --- | --- | --- | --- | --- |
| 1. | Professional technical institutions | 9 | 26 | 0 | 35 |
| 2. | Technological institutions | 6 | 39 | 6 | 51 |
| 3. | University institutions/ Technological schools | 16 | 93 | 12 | 121 |
| 4. | Universities | 31 | 49 | 1 | 81 |
|  | Total | **62** | **207** | **19** | **288** |

Source: Ministerio de Educación Nacional.Table 3.Enrollment by public or private sector, 2013.

| **Sector** | **2013** | **%** |
| --- | --- | --- |
| Public | 1,106,230 | 52.4 |
| Private | 1,002,994 | 47.6 |
| Total | 1.958.429 | 1 |

Source: Ministerio de Educación Nacional.

Table 1 shows that 1.29 million student enrolments in 2013, out of 4.35 million, were to universities – a gross coverage rate of 28%. The gross coverage rate measures students enrolled at different HEIs as a proportion of the population aged between 17 and 21 years. These figures are taken from National Administrative Department of ***Statistics*** projections based on the 2005 ***census***. This number does not include professional technician and technology students. These enrolments are low compared to international standards (Melo et al., 2014). About 2.37 million people of this age group do not attend HEIs.

Global trends demonstrate that the demand for HE is growing exponentially in developing countries, as indicated in the report for the European Commission (2013; see also British Council, 2012). The pace of demand for education is much faster than the capacity of public institutions to expand their activities, as its growth is limited by budgetary, institutional or physical constraints. So, the private sector plays an important role in the growth of the HE sector, as it is growing much faster than the public HEIs.

In line with this global trend, the population entering secondary education in Colombia is growing rapidly. Hence, the corresponding demand for HE is increasing dramatically in a context of lax state regulation. The supply of publicly funded HE is not growing at the same pace, due to budgetary or physical constraints. Because public HEIs are unable to accommodate more students, the private universities absorb this excess, which adds to the increasing importance of these institutions. As the demand for HE outstrips supply, this gives rise to a huge number of private HEIs (Castillo, 2013; Desiderio and Lechuga, 2012; Rama, 2010). Rabossi (2009) describes that through the neoliberal wave from the early 1990s onwards, the Colombian HE system developed quicker than other South American countries, from a rigid and elitist system into a more competitive model.

The enrolment ***data*** published by the Ministry of Education show the relative importance of university institutions and universities at the undergraduate level. The ***data*** in Table 1 show that only 0.2% of those enrolled in HE (some 3800 individuals) are enrolled in PhD programs.

Private HEIs outstrip public ones in numbers of institutions (Table 2), which is in line with the global trend (e.g. Levy, 2013). A total of 141 private HEIs enrolled 1,002,994 students in 2013 (47.6%) as shown in Table 3. Further, 46 public HEIs also accounted for a great number of enrolments: 1,106,230 students enrolled in 2013 (52.4%). Public HEIs accounted for a slightly larger number of students, but this is declining slowly in favour of private HEIs, while the total student numbers remain more or less equal.

While the number of private institutions is growing, their average quality is not improving. The quality of the education they provide is differentiated and stratified (Bonilla, 2007). The HEIs in the private sector are of two types: 1) a small number of private institutions that offer high-quality education for a small number of individuals at a very high cost; and 2) low-fee education offered through a large number of private institutions for many students that come from low-income families. Once graduated, students from the first type of HE gain access to the highest incomes and social recognition; but this is not the case for the second group (See for example Hanushek and Wößmann, 2012). In this group, universities are only fulfilling the *minimum requirements* for quality (i.e. qualified registration).

A substantial proportion of the students pursue their studies in low-quality programs and choose their courses for ease of access and the ability to attend classes at night. Students and graduates concentrate on a few fields of study, especially administrative sciences, education and law.

As explained, there is a wide hierarchy of establishments in terms of quality. This leads to a downgrading of some diplomas awarded to graduates in inexpensive establishments. Most of the private low-fee universities are known as demand-absorptive institutions, as they emerge on to the market without adequate public regulation. Students are unlikely to fulfil the standards of knowledge and skills required in the current labour market.

The weaknesses of teaching quality manifest themselves in several ways: Teachers are often hired on an hourly basis.Research resources are improvised and very limited.There is limited student selection, leading to mass enrolment, particularly of students from low-income households.

Other problems associated with low-quality education are the inequalities of access. While the average gross rate of enrolment in the lowest income group was 8.5% for the period 2002–2007, for the highest income group this average rate was 88.3% (Castillo, 2013). This may be another factor that influences the dispersion of future earnings. Variations in quality have led to differentiation in educational attainment, the earnings that graduates receive, expectations, frustrations, underemployment and unemployment.

**Some considerations on the quality of higher education in Colombia**

The unfulfilled demand for HE has led, as explained, to the further proliferation of private institutions, following the Act 30 of Parliament of 28 December 1992 referred to above. However, this development has raised concerns about the quality of the education being offered by the system. The quality of private education seems to be more heterogeneous than that provided in the public sector, and their qualifications lack the academic rigour to fulfil the minimum requirements expected of a professional diploma. This has been addressed by several studies in the following countries, including: Chang (2007) for Malaysia; Tsevi (2014) for Ghana; Silas (2005) for México; Rodríguez and Viegas (2011) for Portugal; AUCC (2011) for Canada; and Radloff and Coates (2013) for Australia.

To ensure the quality of teaching, the Colombian state established a National System of Accreditation. One condition involves what is known as qualified registration (QR), a mandatory mechanism through which the Ministry of Education verifies and ensures that HEIs comply with a number of minimum quality standards that a HE program must meet. Every program must obtain QR to operate from its inception. Once given, it lasts for seven years. If the conditions are maintained, then this registration is extended for another seven years.

The registration is subject to academic and institutional conditions. The former denote the curriculum content (relevance), research training, human resources, number and quality of teachers, physical infrastructure and social relevance of programs. The institutional conditions establish mechanisms for the selection of future students, the evaluation of students and teachers, administrative and academic structures, self-assessment, monitoring policies for graduates, university welfare and financial resources. Financial conditions establish the financial viability of programs (Act 1295, 2010 [DECREE No. 1295 REPUBLIC OF COLOMBIA]).

Additionally, institutions can engage in a voluntary process to attain the highest quality standards. This type of accreditation is demanding and temporary, being granted for periods of three to 10 years for programs, and six to 12 years for institutions. In other words, accreditation is a mechanism through which institutions and/or programs demonstrate that they meet the high-quality standards prescribed by the National Accreditation Board. Some universities that are accredited as high quality do not get all their programs accredited.

In 2014, for instance, of the 3685 university programs, all met the basic quality requirements for QR, but only 705 were accredited with high quality (See Table 4). The Colombian HE system has a vast number of universities operating under the minimum quality requirements. Table 4.Academic programs offer by level training, 2014.

| **Level** | **With qualified registration** | **HQA** | **Percentage of programs with HQA** |
| --- | --- | --- | --- |
| Technical Professional | 762 | 22 | 2.9 |
| Technological | 1568 | 71 | 4.5 |
| University | 3685 | 705 | 19.1 |
| Specialization | 2979 | 1 | 0 |
| MSc | 1232 | 11 | 0.9 |
| PhD | 212 | 3 | 1.4 |
| Total | 10438 | 813 | 7.8 |

*Note*: HQA: High Quality Accreditation. Source: Ministerio de Educación Nacional.

While the private universities have to meet the first requirement, many of them do not meet the second, the high-quality accreditation (HQA) of undergraduate programs (see the next section). These programs do not have state recognition of the quality standards of HEIs and academic programs awarded under voluntary accreditation. According to the Ministry of Education in 2014, 19.3% (718 out of 3715) of undergraduate university programs were accredited with high-quality standards, while only 11.8% of private universities (34 out of 189) were accredited with high quality (CNA, 2014).

**Provision of higher education, returns on investment and poverty traps**

Referring back to the relationship between education and income in the framework of HCT, and the rising importance of private institutions providing HE, there is great diversity in the quality standards of the education that they offer (OECD, 2012). In some private HEIs, low-quality education may be the norm rather than the exception, which can have some distorting effects on personal income.

***Data*** show that the minimum wage in Colombia is €245 per month, and 11.41 million people (57.5% of the employed workforce) earn the minimum wage or less (ACRIP Nacional, 2013). For people who earn the minimum wage it is financially difficult to send their children to university. Furthermore, about 50% of the labour force is informal, in the sense that these workers do not have an employment contract, earn salaries below the minimum wage and are without access to social security. According to the National Administrative Department of ***Statistics***, 9.1% of the labour force was unemployed in 2014.

This situation has implications for a vast group of people in terms of their opportunities to get access to HE, see for example World Bank (2014). It is unaffordable for them, given the limited availability of publicly funded HE and the high cost of good quality private education. The lack of places at public universities and the expensive tuition at some prestigious private HEIs has led to a proliferation of low-quality private universities. Inexpensive university institutions can be seen as an attractive alternative for a large number of people who cannot access public education and are excluded from the best private universities because of the cost. There are few alternatives to choose from. However, even the low fees they charge take a large share of the incomes of these low-earning households. Individuals can pay for inexpensive but poor-quality education that, in the end, does not translate into higher future incomes. Some of them can get access to HE, but only that of an inferior quality, in institutions with a weak reputation. The quality of these sorts of institutions is measured by their mere compliance with the basic quality standards required for QR. This situation has economic as well as social consequences for those population groups with limited means.

Even when public education is the most important provider of education in a country such as Colombia, private education has a role to play in the process. Its performance needs to be evaluated in terms of the income of its alumni, and in the context of the relationship between investment in education quality and its returns.

**Research method**

The ***data*** used in this research were collected using two different questionnaires. Both questionnaires were piloted amongst four respondents and, consequently, slightly adapted. The first ***survey*** was filled out by 500 undergraduate students selected from 12 low-cost universities in Bogotá (between 40 and 50 per university) based on a non-probability convenience sampling. We visited the sites of these twelve universities and distributed the questionnaires on the spot. Between 60% and 90% of the students were willing to fill out our ***survey***. The second ***survey*** involved a poll amongst 200 graduates, through a snowball sampling by email. Although these ways of non-probability sampling might affect our validity, we think that the large number of respondents used in this study can compensate this.

The private HEIs were selected based on the cost of their fees. Some of them are known as demand-absorption institutions (World Bank, 2012). For the purpose of illustration and validation of the findings of our ***survey***, four interviews were held with one student from the best public university in Bogotá (National University of Colombia) and three graduates from low-fee universities.

The main aim of the questionnaire was to determine the respondents' perceptions regarding the quality of education they received. They were also questioned about their expectations of the future, such as their integration into the labour market. One of the most important variables was the expenditure of these students on their enrolment in HE, in other words, whether the reason for studying at a particular university was an economic one. Another variable involved how this related to expected returns on this investment, measured by the income they expected to earn. While a cheaper fee does not necessarily equate with a lower quality of education, we assumed a link between the cost of enrolment and the quality indicators. The ***survey*** consisted of three parts. It investigated: 1) whether the main reason for going to that university was economic or academic; 2) some quality variables of HE such as teachers, libraries and research activities; and 3) possible discrimination by students and graduates of other universities.

Graduates were asked about the university they had graduated from, their perceptions about the quality of education they received, their current remuneration and whether they had had difficulty finding a job. In addition, some questions about the relevance and worth of the knowledge and its applicability to the current labour market were used, as indicators as to whether they considered studying as a long-term investment to obtain higher incomes and a better quality of life.

**Findings**

**Undergraduate students**

The first part of our ***survey*** involved 500 undergraduate students, both males and females. On average, the number of female students was higher than the number of males, who were dominant in the science, engineering and maths disciplines. Students' ages ranged from 17 to 18 in the first semester, and up to approximately 24 years when they completed their studies. As shown in Table 5, 22% of the students studied in the first semester, 16% in the second and 23% in the third semester; 39% were distributed over the fourth to the 10th semesters. Table 6 shows information about the students' chosen disciplines. A large number of respondents were studying law (65 individuals, 13%), psychology (47 individuals, 9%) and architecture (39 individuals, 8%), while 22% were studying different engineering courses and 48% were distributed among subjects such as international business, public accounting, industrial design and business administration, among others. Table 5.Coursing semester student.

| **Semester** | **Number of students** | **Semester students currently valid %** |
| --- | --- | --- |
| 1 | 112 | 22.4 |
| 2 | 82 | 16.4 |
| 3 | 115 | 23.0 |
| 4 | 44 | 8.8 |
| 5 | 41 | 8.2 |
| 6 | 23 | 4.6 |
| 7 | 37 | 7.4 |
| 8 | 8 | 1.6 |
| 9 | 16 | 3.2 |
| 10 | 20 | 4.0 |
| Total | 500 | 99.8 |

Table 6.The most popular major subjects among students.

| **Discipline** | **Student enrolment** |
| --- | --- |
| Law | 13.0% |
| Psychology | 9.4% |
| Architecture | 7.8% |
| Systems Engineering | 5.4% |
| Industrial Engineering | 4.8% |
| Civil Engineering | 4.4% |
| International Business | 5.8% |
| Children Education | 3.8% |
| Environmental Engineering | 3.2% |
| Physical Culture and sport | 3.0% |
| Public Accounting | 3.0% |
| Social Communication and Journalism | 3.0% |
| Business Administration | 2.8% |
| Industrial Design | 2.8% |
| Environmental Engineering | 2.4% |
| Tourism and Hotel Management | 1.8% |
| Mechanical Engineering | 1.6% |

In Table 7 we classify the costs of studying at a number of private HEIs in Colombia, showing the most expensive and some lower-fee universities, and attempt to correlate these variables with education quality. Table 7 shows that the top private Colombian universities attained both QR and HQA, the two main indicators of education quality in Colombia. Low-priced universities achieved just QR, which indicates that the quality of education they offer is not good enough according to these (and other) criteria to evaluate quality, in the sense that they could only just fulfil basic quality requirements. Table 7.Average costs per semester, 2014.

| **University** | **Location** | **Affiliation** | **AV fee (€)** | **QR** | **HQA** |
| --- | --- | --- | --- | --- | --- |
| Los Andes | Bogotá | Private | 5028 | Yes | Yes |
| Rosario | Bogotá | Private | 3381 | Yes | Yes |
| Javeriana | Bogotá | Private | 3370 | Yes | Yes |
| Externado | Bogotá | Private | 2706 | Yes | Yes |
| Piloto | Bogotá | Private | 1627 | Yes | No |
| UAN | Bogotá | Private | 1460 | Yes | No |
| Catholic | Bogotá | Private | 1401 | Yes | No |
| Gran Colombia | Bogotá | Private | 1262 | Yes | No |
| Autónoma | Bogotá | Private | 1239 | Yes | No |
| Minuto | Bogotá | Private | 989 | Yes | No |
| ECCI | Bogotá | Private | 842 | Yes | No |
| UNIPANAM | Bogotá | Private | 774 | Yes | No |

Source: Each university, respectively, and CNA.Exchange rate 2 August 2014: €1 = COL$2517 (Colombian Pesos).QR: qualified registration; HQA: high-quality accreditation; ECCI: Escuela Colombiana de Carreras Intermedias; UNIPANAM: Pan-American University; UAN: Universidad Antonio Nariño; Av: Average.

The cost of studying at all of these private HEIs ranged from an average of €5028 per semester at the University of Los Andes, the most expensive in Colombia, to €774 at the Pan-American University (UNIPANAM), as the cheapest one. But even between the most expensive universities, there are important differences in costs. For example, the difference in fees between the University of Los Andes and Rosario University is some €1647.

Table 7 shows an emerging pattern. It seems that according to the quality criteria of Colombian HE, which are materialized in the HQA, expensive education is generally of better quality than low-priced education. The former has both QR and HQA.

In low-fee universities, the costs range from €1648 per semester (Pilot University) to €774 (UNIPANAM). According to the ***data***, for 50% of students the main reason for studying at one of these universities was academic. This means that they believed that the education was of good quality. However, 41% of them explained that economic considerations, or the costs of the fees, were an important reason for choosing a university. Despite the high number of students that are at those universities, supposedly for academic reasons, 72.2% of the respondents wanted to change university.

This high number implies that students are dissatisfied with their current university and would like to transfer to universities that are recognized as offering good quality, whether public or private. Examples of these include: National University of Columbia (public) 14.8%; Javeriana University (private) 6.4%; University of Los Andes (private) 6.4%; District University of Bogotá (public) 4.4%; Externado University (private) 3%; and Rosario University (private) 3.4%. In order of preferences, 25% of the students would like to study at a recognized public university, while 23% would like to change to a renowned private HEI. The students’ preferences coincided with the level of the fees, which could be considered an indicator of the quality of the institution as perceived by the students. In other words, the higher the fee, the more likely the quality of education is considered to be high, and the more eager students are to attend such an institution.

In addition, an average of 44.2% of students reported that they were certain that the quality of their teachers was inadequate. They believed that only some teachers were sufficiently qualified. This value was considered higher at Autónoma (60%) and UNIPANAM (56%). According to the ***data***, this is in line with other findings related to the quality of teachers in the Colombian HE system. Between institutions, the percentage of the students who wanted to study in other universities was on average 72%. This ranged from 46% (which in itself is high) to one low-fee private HEI – the most inexpensive one – at which 90% wanted to transfer (see Figure 1). Figure 1.Percentages of students wanting to study at another university. *Note*: Minute: Minuto University; G Colombia: Gran Colombia University; CUN: Corporación Unificada Nacional de Educación Superior CUN; UNNINCA: Universidad Incca de Colombia; ECCI: Escuela Colombiana de Carreras Industriales; UAN: Universidad Antonio Nariño.

Out of all of the 116,819 university teachers in Colombia for the year 2014, 31% were full-time teachers and 14% were part-time teachers. More than half of the teachers (55%) were part-time teachers who were remunerated according to the hours they worked (Ministry of Education, 2014). However, the inexpensive universities hired part-time teachers who often worked simultaneously at more than one university. Staff with PhDs were more likely to be employed at the public universities and the expensive private universities. It is common that in low-fee faculties there are very few teachers and professors with a PhD. The students consulted in the poll stated that only 27% of the teachers spoke a second language apart from Spanish, while 22% of the students did not know whether the teachers spoke another language. In addition, 35% of the students were convinced that the facilities at their universities were of poor quality, especially the libraries (23%).

Part of the ***survey*** was directed at the students' opinions about the potential labour market. Many students, 42% (211) expressed the opinion that it would be difficult to find a job once they graduated. When asked whether they felt equal to graduates from expensive universities, 51% said they felt some degree of labour and social discrimination, while 100 students (20%) expected to earn a lower wage, and about 10% believed that they would be poorly paid and employed in a field outside of what they had studied.

**Graduate students**

The second part of our investigation involved 200 former students who had graduated from the lower-fee private HEIs. The graduates agreed that they considered the relationship between the investment in HE and returns on that investment as very uncertain. They thought that investing in tertiary education would not automatically give them a positive return, which contradicts the assumptions of HCT. Their frustrations seemed to be particularly caused by the quality of the education they had received, based on their own perceptions and the perceptions of their future employers.

Of the graduate students, 88% were employed, 83% were in a formal job, 44% of them had found it very difficult to find a job and 63% of them considered their salary lower than expected. Only 4% stated that they had found a well-paid job. Underemployment, in other words, being hired in a position that is not commensurate with their qualifications, or having to work more hours that they were actually paid for, was alarmingly high at 33.3%. Some graduates were working in fields different to what they studied. In that sense, 63% of the graduates stated that they felt underpaid, as they were working either in non-graduate jobs or in work outside the subject of their degree.

Strikingly, 35% of the graduates found that the education they had received was of poor quality; many of the current students wanted to study at another university. They generally considered the quality of the teachers, the facilities and libraries as inadequate, and found that the private HEI only complied with the basic requirements for teaching quality. Many teachers are only contracted for the two or four hours that they spend in the classroom each day and they do not feel strongly connected with the university. Full-time teachers or those on tenured contracts are rare in inexpensive universities.

A further problem is that 48% of the respondents found that their skills were incomplete or not of a high enough standard to enable them to find work in the current labour market: 33% of them found that they could not perform successfully in the current labour market, and 25% found that they could cope to some extent, but that they could not perform well. In total, 65% of the graduates had not reached an important position in their career path. What is more surprising is that a very high percentage of the graduates (38%) believed that the money they had spent on education had not proved to be an investment, while 29% revealed that they had suffered from discrimination. This discrimination was reflected in employers who preferred to hire graduates from some universities, while rejecting or paying lower wages to people from others.

Some of our findings were corroborated by the four interviews that were carried out as an illustration for this research. The first interview we conducted was with an engineering student at a recognized university in Bogotá. He was working and studying at the same time. He worked as supervisor in part time, but still had a better salary and position than a graduate engineer from a low-fee university, who would be very unlikely to reach a better position and earn more wages due to his educational background.

The graduates interviewed expressed frustration about the inability to meet their pay and career expectations because, although most of them had found a job, their employers underestimated their abilities. Their working hours were long and they were paid far below what a professional graduate from other universities received, even for similar jobs. “I feel discriminated against because I receive lower wages, work longer hours, and have less opportunities for promotion at work, than graduates from top universities” explained one of the respondents. So, for graduates from a low-fee university, there are fewer opportunities to regain their investment in terms of money and effort, dedication and personal sacrifice, at least in the short and medium term.

**Discussion**

HCT assumes that investing in education, especially HE, will provide greater returns through the higher salaries that would be earned once people graduate. We think that investments in HE do not always translate into positive returns, especially for low-income families who invest their scarce resources in HE so that their offspring may attend low-fee private universities.

Our most important findings relate to the dissatisfaction expressed by students and graduates with the lower-fee universities. As our results showed, 72% of the students enrolled at lower-fee universities in Colombia had wanted to study at another university, while 41% chose the university for economic and not academic reasons. This coincides with findings from the popular media and the Ministry of Education. The students’ choices were often limited to inexpensive private HEIs, as demonstrated, for example, in a special edition on HE featured in *El Tiempo* newspaper (*El Tiempo*, 2014). Students from low-income households commonly came from poorer quality schools (Montenegro, 2015; Banco Mundial, 2009) and they considered the quality of their lecturers as weak. According to Ministerio de Educación Nacional (2014), 38% of teachers in Colombia do not have a postgraduate qualification. The remaining 61.3% are postgraduate teachers, differentiated as follows: 31.6% have a specialization; 23.8% have a masters; and only 5.8% (6803 individuals) have a PhD. Our study shows that 60% of the graduate students from the same institutions expected to be underpaid and 40% felt they lacked sufficient skills to succeed in the current labour market.

Interestingly, Acemoglu and Autor (2011) consider school quality as a crucial factor when discussing investments in human capital. Amongst the components of school quality, they mention the spending per pupil and the educational quality of teachers, aspects which also appeared crucial in our findings.

Because our findings from the ***surveys*** and interviews demonstrate that students perceive they are getting lower-fee but inferior quality HE, the assumptions of the classical HCT are hard to maintain. Our study reveals that, for the poorest strata of the population, having access to HE can no longer be seen as a way out – that is, a step on the ladder towards economic and social improvements. In the views of the students/graduates, the education provided at low-fee private universities does not empower them with sufficient conditions, skills or abilities to break down the cycle of intergenerational poverty (Baum and Ma, 2007; Blanden et al., 2007).

When considering HE as part of the education sector for providing more equal opportunities, in Colombia the accessibility of universities is no longer the main object for discussion (e.g. Molla, 2014; Rabossi, 2009). Instead, the actual and perceived quality of HE should be taken into consideration, while focus should not be placed on a mere compliance with the basic quality standards, but should take into account the experiences and perceptions of students, graduates and employers. Our study has shown that when viewing the impact of HCT within a neo-liberal discourse, the further growth of a private but accessible HE sector can reinforce stratification and differentiation of opportunities, instead of creating more equality amongst the population.

**Conclusion**

In conclusion, it is clear that the quality of HE should play a more important role when investigating its outcomes. Our main findings suggest that not all funding spent on HE can be considered a long-term investment, as students and graduates do not expect or receive social recognition or a material return on such investments in terms of better employment prospects or a higher income.

Our findings demonstrate that students and former students of low-fee universities perceived the quality of education as weak; they seemed to lack certain skills and they experienced difficulties and discrimination in the labour market. As a result, graduates from these universities expected to be poorly paid, even if they found a job. Some were unemployed or underemployed. Many of them believed that they lacked the abilities necessary to function successfully in the current labour market.

The implications of the considerations outlined above mean that the authorities, such as the Ministry of Education and the related institutions, have to rethink the monitoring of the quality of HE in Colombia. Accessibility has become much less of an issue than the comparability of educational quality. Stricter compliance with the requirements of quality and discipline by private HEIs that do not fully meet the quality conditions is required. In order to achieve this, central government and regional authorities need to face up to the possibility of making the voluntary accreditation process more enforceable and shaking up the National Council for Accreditation. In addition, they must implement more stringent requirements in the process of authorizing the opening of more private HEIs. However, compliance with formal quality criteria is insufficient, as perceptions of students, graduates and employers play an important part.

As a follow-up to this study, a more elaborate investigation involving the collection of more ***data***, for example in other Colombian cities outside Bogotá, is recommendable. This would help to expand the knowledge on HE quality and the importance of how quality is experienced and perceived. The stratifying effects of the expansion of private HE cannot be ignored when considering schooling in developing counties.

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**ABSTRACT**

This article deals with migration flows from and to Poland from a skills perspective. It argues that Poland’s economy is skewed towards lower to medium skills and, confronted with an ‘education boom’ in higher education, is not able to absorb its supply of highly qualified workers. As a result, a strong push factor to emigration has been created, which should be seen as a brain overflow rather than a brain drain. On the other hand, the sectors requiring relatively low skills and offering the lowest wages are facing labour shortages. Immigrants from the former Soviet Union are filling this gap. We argue that Poland represents a specific place in the migration chain, as there is no clear substitution of migrating workers with immigrants; rather, the nature of emigration and immigration reinforces the socio-economic model in Poland.

**FULL TEXT**

**Introduction**

Since the 2004 EU enlargement, Poland has remained one of the biggest sending countries in the European Union. Such a significant outflow, exceeding one and a half million people, has strongly affected both the Polish labour market and the receiving ones. To date, studies on Polish labour migration have focused on the most important characteristics, dynamics and impact of Polish migration, including intensified waves of Polish migration to the United Kingdom (Burnel, 2012), structural and individual factors influencing decisions about migration (Black et al., 2010) or family strategies and transnational migration of Poles abroad (Ryan et al., 2009). This article presents the phenomenon of migration beyond a focus only on labour force outflow, but also in the context of a migration chain – where Poland is located in this chain – and discusses whether migration inflows are filling gaps in the labour market created by outflows of Poles to other countries. We argue that in the Polish case immigration inflows both substitute and complement the (significantly bigger) outflows of Poles. The simultaneous occurrence is not accidental and reflects the very nature of the labour market centred on medium to low skills: the insufficient demand for university graduates (reflected in both the high level of unemployment and low wages) and low wages for low-skilled jobs (for example, in some sectors of manufacturing, services, construction or ***agriculture***). As a result, the two categories of workers are migrating from Poland, but only the latter are being substituted by immigrants willing to accept inferior work and pay.

The focus of this article is more on the migration chain in a macro perspective and it takes into account the European context, in which national migration and mobility trends play a role. Our main argument is that migration from and to Poland is driven mainly by socio-economic considerations. We also argue that the outflow of highly skilled workers is part of a brain overflow rather than a brain drain. We also illustrate the main thrust of immigration to Poland, namely the demand for low-skilled and low-paid workers. The article opens by presenting the basic trends in the literature on migration and migration chains in Europe, then focuses on the Polish case, describing (i) the character of Polish migration and (ii) regulations on immigrants in Poland and the basic features of a new wave of labour inflow from the east.

**Poland in the migration chain and the impact of its skills structure: review of research**

The concept of migration chain has two basic meanings. It was first proposed by CA Price (1963) as ‘chain migration’, but other researchers focusing on mechanisms driving immigration have tended to use it more with reference to micro processes, such as the family and social networks used for ‘immigration reproduction’ (see, for instance, Yu, 2008; Carr and Tienda, 2013).

In a broader sense, Polish immigration stems from a specific capitalist model that has developed in Poland, a version of the east European variety of capitalism characterized by a low level of coordination, a flexible labour market and overall weakness on the part of employees in relation to employers (Crowley, 2004). The trend to lower labour costs largely appeared as a result of the race to the bottom between the Central and Eastern European countries aiming at attracting foreign direct investment and in the hope of creating more jobs. Although Poland’s model of capitalism has been labelled an ‘embedded’ version of economic liberalism and clustered together with the Czech Republic, Slovakia and Hungary (Bohle and Greskovits, 2012), the Polish labour market is far more flexible than those of the other three countries. Thus, recent analyses underline the problem of labour market segmentation and the rise of precarious labour (Baranowska et al., 2011). Poland has become the European leader with regard to temporary employment contracts, as it doggedly implements pro-employer labour market policies. In short, the dominance of cost-reduction strategies and labour market ‘flexibilization’ has attracted investors seeking low-skills/low-wage workers, which has further slowed any possible wage increases.

Furthermore, Poland has been the subject of research on the migration chain in the context of migrant care workers (Lutz and Palenga-Möllenbeck, 2012). In short, Poland is both the source and the destination of informal care workers, usually female. On the one hand, Polish informal workers provide a cheap care service option in countries lacking affordable formal services (southern Europe). On the other hand, care workers, mostly from Ukraine, represent an alternative for Polish families also faced with a lack of infrastructure. These processes have been labelled a ‘care drain’ or ‘chain of care’. They create problems, such as ‘care gaps’ in care workers’ countries of origin. Another Polish discussion is related to the problem of so-called ‘Euro-orphans’ (Urbańska, 2009). The common denominator of all the countries involved in the ‘chain of care’ is the weakness of their social policies and welfare provisions.

A further stream of research stresses the importance of the so-called ‘brain drain’. People deciding to migrate have a higher than average level of education. However, the over-representation of persons with higher education among Polish migrants does not have negative effects on the Polish labour market because there are already too many graduates for the relevant jobs. Moreover, those who migrate are often employed abroad in workplaces requiring merely general and simple skills. Our argument here is that instead of the classic brain drain, what is happening to Polish graduates should rather be labelled a ‘brain overflow’.

We would like to look at migration processes in a larger framework, emphasizing skills-based migration. Poland’s migration flows are something of a special case within the EU as they are characterized by a relatively low age of migrants and a relatively high level of education (Kaczmarczyk, 2011). Figure 1 depicts the migration rate of highly educated people in European OECD members. Poland has one of the highest rates.

**Figure 1.**

Emigration rate of highly skilled individuals in selected OECD countries, 2010/2011 (%).

Source: Database on Immigrants in OECD and non-OECD countries (DIOC-E) 2010/11.

In normal circumstances these phenomena would contribute to a brain drain, a flow of highly educated specialists (usually defined by higher education) from less developed to more developed countries. In policy-oriented but also theoretical debates, the mechanism of brain drain is not new; it has been discussed since the 1960s (Adams, 1968). However, relatively little attention has been paid to this topic compared with general issues of labour migration. This sidelining of the issue is the result of the focus on uni-directional aspects of migration (such as loss of ‘human capital’ in a sending country), combined with a perception of migrants as a homogenous group. Along with increased attention to the heterogeneity of migrants, more nuanced analyses have emerged.

An important caveat of this article is that, in the case of more prolonged migration from Poland (such as to the United Kingdom, and unlike to the Netherlands, where there has been circular migration), a specific profile of highly skilled migrants emerges; approximately half of all migrants have tertiary qualifications, but are also relatively young, and thus lack work experience. Therefore, when we talk about level of skills, by and large we mean level of education. This is the result of a lack of labour demand in Poland, which seems to be the cause of several labour market difficulties.

Our argument is based on the new economics of labour migration approach (Stark and Taylor, 1985) and related to relative deprivation (Stark and Taylor, 1991). Accordingly, people’s comparison of their personal income to others in a reference group, which contributes to their personal assessment of relative deprivation, has been identified as a key driver of migration. We argue that while the classic social policy instruments aimed at mitigating low incomes (both cash benefits and services) are being deliberately depleted, it is relative deprivation – another factor in which is personal aspiration – that drives migration.

Therefore, we put skills at the centre of our analysis. The Polish economic model is based on low skills and low wages, while qualified or skilled labour is abundant and increasing. Figure 2 presents our argument in a synthetic form.

**Figure 2.**

Poland in the migration chain – a scheme for further analysis.

Although it is beyond the scope of this article to provide evidence on the micro level or to present the effects of migrant labour on the economy, we believe that setting out the argument on the macro level provides an empirical and analytical ground for further, more detailed analyses.

**Low-skills/low-wage equilibrium in Poland and the overproduction of higher education graduates**

As already mentioned, ‘in absolute terms’, Poland is one of the main sources of international migration within the EU. More than 1.9 million Poles are currently living in other European countries (GUS, 2015a). ***Data*** for 2011 (***Census***) indicate that the United Kingdom remains the main destination (625,000 people), while Germany has absorbed 470,000 Polish citizens. Ireland comes in third place, with 120,000 Polish citizens living and (very often) working there. According to the migrant ***survey*** conducted in 2011, finding employment is the main reason for migration for 73 per cent of Poles, while for 16 per cent the main driver is family reasons (such as family reunification) (GUS, 2012).

A more recent ***survey*** conducted among working-age individuals in Poland indicates that almost 20 per cent of that group are considering migration. Those particularly interested are young people (40 per cent in the age group 18–24 and 35 per cent in the age group 25–34). Men are slightly more prone to migrate than women. When it comes to the educational profile, the lower the educational attainment, the higher the share of respondents declaring their willingness to migrate. Among people with basic vocational education and below, around 30 per cent considered migration, while for all individuals the share of positive answers was 15 per cent (Work Service, 2014). These answers reflect the relatively stable unemployment distribution among graduates within 12 months of leaving school. In the first quarter of 2015 unemployment was highest among graduates from secondary schools (48.4 per cent), followed by basic vocational level (41.9 per cent) and lowest among university graduates (23.2 per cent). However, it should be noted that in absolute terms the number of university graduates is four times higher than that of secondary school graduates (GUS, 2015b).

The share of respondents willing to migrate is higher in small towns than in larger cities. This willingness is also higher in the case of people with no income whatsoever, and among the unemployed as compared with the employed. The main motive for migration is higher income (84 per cent), followed by a better standard of living (33 per cent), better work prospects (26 per cent) and lack of decent work in Poland (25 per cent) (Work Service, 2014).

These outcomes derive from the current relationship between the labour market and the education system. One particular feature of the Polish economy is its significantly higher share of employment in ***agriculture*** (11.3 per cent in 2011 compared with 3.9 per cent for the EU-28). The share of highly educated workers – managers, professionals and technicians – is 5 percentage points lower than the European average. Therefore, the structure of employment is skewed towards middle/lower skills as compared with other EU Member States (Cedefop, 2014). Also, the demand for workers has been centred on this type of skills, with comparatively less emphasis on higher skills (GUS, 2015c).

At the same time, Poland now has one of the largest numbers of people in higher education. In the academic year 2011/2012, there were approximately 2 million students, which is the second highest student population per capita in the EU (after Greece) (European Commission/EACEA/Eurydice, 2015). This phenomenon, reflecting an ‘education boom’, has created an abundant supply of highly educated graduates, but the labour market is not able to absorb them. Accordingly, approximately 20–25 per cent of university graduates remain jobless a year after graduation (GUS, 2012). Thus, the unemployment of university graduates represents one of the main push factors of Polish migration; work-led migration is often labelled ‘the export of unemployment’. In general, the highest levels of unemployment were noted between 2001 and 2004; in 2001, 40 per cent of respondents pointed to unemployment as the main reason for migrating, while by 2007 the share of such respondents had decreased to 22 per cent (Grabowska-Lusińska, 2012). At the same time, while some authors discard the hypothesis of the ‘export of unemployment’ because the estimated impact of migration on the aggregate unemployment rate did not exceed 0.4 percentage points in the peak years (the mid-2000s) (Budnik, 2007), the possible impact on some local labour markets could be significantly higher. This argument is substantiated by the fact that local labour markets display remarkable diversity and only to some extent follow changes in aggregate unemployment ratios (Tyrowicz, 2011). A look at regional ***statistics*** on migration flows indicates that the regions with an above-average unemployment rate experienced the highest migration flows. The highest outflows were noted in Opolskie voivodship (located in south-west Poland), Podkarpackie, Świętokrzyskie and Podlaskie, Lubuskie and Warmińskio-Mazurskie voivodships (eastern Poland). The outflow from regions with traditionally low unemployment – Mazowieckie, Wielkopolskie and Śląskie – were the lowest in Poland (Kaczmarczyk, 2014).

A ***survey*** conducted in Germany, Ireland, the UK and the Netherlands on behalf of the Central Bank of Poland (quoted in Maciejewicz, 2015) allows some inferences to be drawn about migrants from Poland in the above-mentioned countries. Approximately one-third of them did not work before migration. Also before migration, while one-third of them occupied positions requiring high skills – such as managers, specialists and company owners – a majority of migrants perform simple jobs requiring basic qualifications in the host country. This indicates that Polish migrants are often overqualified for the job they are performing. Only a very long stay, initiated before EU enlargement, is a guarantee of wages comparable to those of natives. Nevertheless, wages are still higher than in Poland, thus deterring them from returning home (Chmielewska, 2015). The hypothesis of a large wage differential has been challenged recently for the United Kingdom, as it was argued that after controlling for socio-demographic characteristics of migrants, the difference remains low in general, or even insignificant in the case of highly skilled migrants (Kaczmarczyk and Tyrowicz, 2015). Such a finding does not invalidate our argument, as we claim that it is not the wage differential that is central to migration decisions, but rather unfulfilled aspirations, for which more general labour market mechanisms are responsible. Also, declarations regarding willingness to stay in the receiving countries reflect factors other than income.

To sum up, within the past decade, Poland has witnessed a significant migration outflow to western Europe. The ***data*** indicate that many migrants are young and relatively highly qualified, but also lack work experience. We argue that labour market difficulties related to skills have contributed to migration outflows. At the same time, despite being overskilled for the jobs offered on the local labour market and facing barriers to professional development, Poles, with some exceptions, tend to stay in receiving countries.

**Immigration to Poland: skills gap and reinforcement of the low-wage/low-skills equilibrium**

According to the recent ***census*** (2011), immigrants represent only 0.2 per cent of the inhabitants of Poland, although the number has increased due to the crisis in Ukraine. This can be contrasted with the ***statistics*** published by the Central Statistical Office with regard to Polish emigrants abroad, who amount to about two million (2013). This demonstrates Poland’s status, especially in the context of the European Union, as a classic emigration country. The largest groups of immigrants to Poland come from Ukraine, China, Vietnam, Belarus and India. Ukrainians account for almost one-third of all immigrants (see Table 1).

Until 2006, the main way of formalizing immigrants’ employment contracts and residence was to obtain a work permit, after undergoing a local labour market test for each employment contract. As a result of reforms in 2006, 2011 and 2013, migrants from Armenia, Belarus, Georgia, Moldova, Russia and Ukraine are subject to a simplified work permit procedure. According to the new legislation, when hiring citizens of the above-mentioned countries, Polish employers only need to submit a special employment declaration (not the usual work permits), if employment does not exceed six months within a period of 12 months, to legalize the employment contract. In other words, it is enough if a potential employer submits a simple declaration of employment, without going through a complicated procedure. A reform of 2014 introduces a couple of further improvements and simplification of the whole system, although some conditions have become stricter, such as the increase in the level of income required for a residence permit application.

**Table 1.**

The number of work permits and employment declarations issued in 2014 according to applicant’s country of origin.

| **Country of origin** | **Work permits** | **Employment declarations** |
| --- | --- | --- |
| Ukraine | 28,913 | 372,946 |
| Vietnam | 2345 | --- |
| China | 2126 | --- |
| Belarus | 1926 | 4017 |
| India | 1281 | --- |
| Uzbekistan | 1215 | --- |
| Moldova | 1108 | 6331 |
| Turkey | 723 | --- |
| Russia | 683 | 1227 |
| Serbia | 630 | --- |
| USA | 547 | --- |
| Northern Korea | 377 | --- |
| Armenia | 359 | 774 |
| Southern Korea | 310 | --- |
| Georgia | --- | 2103 |

Sources: Ministry of Labour and Social Affairs; authors’ own calculations.

All other third-country nationals need to apply for work and residence permits after a labour market test and can start employment only after a positive decision on their application. Local lists of professions with job shortages represent the only possibility of avoiding the labour market test for other third-country nationals. These lists are drawn up in consultation with the social partners. Foreign employers in Poland (including top management) are also covered by different legal provisions that exclude the requirement of labour market tests (Wysieńska and Karpiński, 2011).

As a consequence of the new employment declarations, the number of legalized employment contracts has increased quite rapidly in recent years (see Figure 3). Whereas more than 150,000 workers were using the new option in 2008, ***data*** from 2014 show a sharp increase in the number of employment declarations. Interestingly, a small decline between 2009 and 2011 might signal limited demand as a consequence of the economic crisis. On the other hand, the increases in 2013 and 2014 are often interpreted as resulting from the high number of Ukrainians pushed out of their country by the conflict in Ukraine: according to 23 per cent of Ukrainians employed in Poland, the conflict was the most important factor that led to them leaving home and seeking employment and a new place of residence elsewhere. 1

**Figure 3.**

Number of work permits and employment declarations 2005–2014.

Sources: Ministry of Labour and Social Policy; authors’ own calculations.

Ukrainians are the largest immigrant group in Poland: in 2014 more than 96 per cent of employment declarations were issued to this national group; they also represented 60 per cent of all work permits (MPiPS, 2015). Among the countries outside the group eligible for the simplified procedure, China and Vietnam are the main countries of origin of successful applicants.

Within the simplified track of employment declarations, a substantial number of migrants are employed in ***agriculture*** (46 per cent), construction (14.1 per cent) and manufacturing (11 per cent). In the case of work permits the distribution among sectors is more balanced, with construction employees (16.2 per cent) only slightly dominating over wholesale and retail trade workers (15 per cent) (MPiPS, 2015).

Thus, the new alternative track (employment declarations) has become a dominant way of employing migrant workers; Ukrainians represent the vast majority of new migrants in Poland and demand for low-skilled workers (or the supply of jobs requiring simple skills) predominates. The above-mentioned reforms of 2006, 2011 and 2013 that introduced the alternative track coincided with an intense outflow of workers from Poland to western European countries, to a large extent facilitated by Poland’s EU entry. The simplified track was lobbied for by employers in search of cheap labour, especially confronted by a shrinking local labour supply for jobs requiring low skills, with correspondingly low wages (Kowalska, 2014; Szpakowska, 2014). The Association of Fruit Growers was one of the most powerful actors in the process of drafting the new law.

What is especially important from the viewpoint of placing Poland in a migration chain is that the easing of access for workers from eastern Europe and Asia to the Polish labour market reinforced the economic model based on low skills and low wages. The working conditions of migrant workers in Poland are much more difficult than those of Poles: only 14 per cent of migrants working on the basis of employment declarations have a labour contract (in comparison with 55 per cent of Poles), which strongly limits their access to social insurance. The remaining group of migrants is employed on the basis of civil contracts: task-specific contracts (51 per cent) and contracts of mandate (35 per cent) (MPiPS, 2015). While contracts of mandate require payment of some social security contributions, this is not the case with task-specific contracts. As a result, the majority of working migrants do not have access to many social benefits. Moreover, due to the short work periods and a large share of seasonal employment, immigrants are not entitled to many social rights (such as family-related benefits that require at least six months of employment). 2

Moreover, the new track, which is relatively free from state control, has opened the way for possible abuses. As reported by the Labour Inspectorate and Border Guards, out of all the Ukrainians for whom employers issued employment declarations, 82 per cent reach the Polish border, but only 54 per cent in fact perform the work described in the declaration. One explanation of this is that Ukrainians use this less formal track as a possibility to migrate to western Europe, merely transiting through Poland. Another explanation of this ***statistic*** is that fictitious employment declarations are offered to Ukrainians in exchange for payment.

The situation of migrant workers in Poland to some extent mirrors the situation of Poles abroad in the sense that they represent a large labour pool that is relatively easily employable in sectors requiring simple tasks and correspondingly low skills. Apart from the recent military conflict, push factors for Ukrainian migrants include high unemployment, poor working conditions and low wages, which are often delayed or not even paid at all. According to the Ukrainian Ministry of Trade, wage liabilities totalled about €1bn in 2011 (Szpakowska, 2014).

The economic development strategy of attracting FDI to Poland by cutting labour costs and standards has also led to some unintended consequences, which represent another layer of the migration chain in Europe, namely the use of Ukrainian labour in preference to locals by foreign firms locating their businesses in Poland due to incentives. Although there are no ***data*** on this, several such cases have been reported by the media. For example, the Samsung factory in Wronki (western Poland) has already hired more than 60 Ukrainians, with plans to expand job places and attract employees from beyond Poland’s eastern border by offering them housing. 3 Another example of the threat posed by the use of Ukrainian instead of Polish employees emerged in the course of workers’ protests at Amazon’s two logistics centres in Poznań and Wrocław (western Poland), set up in mid-2014 and employing 8500 workers. By the end of 2014 some employees had already quit their jobs at the Amazon warehouse due to unreasonable working conditions and harsh working time management. The first comments in the press suggested that Amazon is likely to seek new employees from Ukraine to keep wages low. The employees who decided to stay set up a trade union and threatened the management with strike action, referring explicitly to the example of strikes in Germany. Management subsequently decided to raise wages in Poland. 4

While the processes taking place in formal employment are relatively easy to grasp, there is only a little research on the situation of irregular migrants in Poland. The size of the irregular immigrant population has been estimated at several hundred thousand. 5 Ukrainian women are often hired as housekeepers or informal carers and suffer from onerous working conditions and a lack of social and employment protection, as well as various forms of exploitation, including the obligation to be available at all times, with no breaks or days off, not to mention lower wages than Polish nannies/carers (such as they are). Another problem is human trafficking, including the forced prostitution of women from post-Soviet countries by Polish criminal groups.

Finally, although most immigrants come to Poland to perform seasonal work in the ***agriculture*** sector, many express a readiness to settle down in Poland. Thus, according to a recent ***survey*** among Ukrainian workers, 76 per cent would consider staying in Poland for a longer period or even permanently. 6 This might signal that Poland is no longer only a transit country on the way to the western European advanced industrialized countries, but might be an alternative final destination for citizens of the post-Soviet countries and especially Ukraine, currently engaged in military conflict.

**Conclusions**

The goal of this article is to present migration to and from Poland within the framework of the migration chain. As previous studies focused mainly on the causes and consequences of the mass migration of Poles to western European countries, especially after EU accession in 2004, our goal was to extend the analysis to the recently intensified eastern migration to Poland. Our main argument is that during its transformation to a market economy, Poland has set out on a path of economic development aimed at attracting foreign investment by lowering labour costs, similar to other countries in the region. As a result of the simultaneous neglect of investment in innovation and domestic production, this strategy has resulted in a low-skills/low-wage equilibrium. Against this background, Polish universities – both public and private – have been producing graduates. Their qualifications are in many cases not enough to find decent jobs, while there is little investment in vocational training, including by employers. High levels of unemployment, poor working conditions and the lack of a safety net are push factors for many Poles to start working abroad, while better living standards and access to welfare state programmes contribute to decisions about long-term migration or settling down in western European countries.

Faced with a shrinking labour supply, employers in sectors such as ***agriculture*** or construction can maintain low wages only with access to labour from beyond Poland’s eastern border. Thus, they lobbied in favour of a new track for work permits, namely the employment declarations that have been in force since 2006. The new track immediately contributed to an increase in the number of formalized employment contracts with Ukrainians, especially in recent years.

The immediate short-term result of such labour market flows will be labour shortages in domestic markets in Poland, only partially filled by migration inflows, which consist mainly of unqualified workers. A more complex issue, given the limitations of immigration to Poland on the basis of simple, badly paid jobs, is labour market adjustments in the longer term. Here adjustment will depend on the political economy of the labour market. If the ‘low equilibrium’ model is maintained, one can expect immigration to cement it further.

Finally, Polish researchers describe integration of third-country nationals in Poland as ‘assimilation by default’ (OBM, 2007: 133; Grzymała-Kazłowska and Weinar, 2006). According to the MIPEX index of integration policies, migration policies in Poland still require closer monitoring and lack coordinated and effective integration strategies, not only with regard to access to the labour market but also with regard to education or anti-discrimination measures. However, together with the intensification of migration, the issue of Poland as occupying a particular place in the migration chain is coming up in public debates on future labour market policies that take account of both outflows and inflows of labour.

**Notes**

FundingThis research was supported by own resources of the International Centre for Research and Analysis in Warsaw.; 1Pracodawcy zainteresowani zatrudnianiem Ukraińców - raport OTTO Polska [Employers are interested in hiring Ukrainians], in: *Gazeta Wrocławska*, available at: [*http://www.strefabiznesu.gazetawroclawska.pl/artykul/pracodawcy-zainteresowani-zatrudnianiem-ukraincow-raport-otto-polska*](http://www.strefabiznesu.gazetawroclawska.pl/artykul/pracodawcy-zainteresowani-zatrudnianiem-ukraincow-raport-otto-polska), accessed 27 July 2015.; 2As a result, immigrants are net payers to the social security system in Poland. However, the number of immigrants is small and lack of ***data*** permits only indicative conclusions.; 3Samsung Wronki zatrudnia Ukraińców [Samsung Wronki hires Ukrainians], in: wyborcza.biz, available at: [*http://wyborcza.biz/biznes/56,100896,17172036,Samsung\_Wronki\_zatrudnia\_Ukraincow,,6.html*](http://wyborcza.biz/biznes/56,100896,17172036,Samsung_Wronki_zatrudnia_Ukraincow,,6.html), accessed 19 November 2015.; 4M Lasek, Dlaczego Amazon ugina się pod presją i daje podwyżki w Polsce? [Why did Amazon bow to pressure and increase wages in Poland?], in: wyborcza.biz, available at: [*http://wyborcza.biz/biznes/1,100896,18408205,amazon-ugina-sie-pod-presja-i-daje-podwyzki-w-polsce.html#ixzz3iT01nMiV*](http://wyborcza.biz/biznes/1,100896,18408205,amazon-ugina-sie-pod-presja-i-daje-podwyzki-w-polsce.html#ixzz3iT01nMiV), accessed 19 November 2015.; 5For these reasons the government announces a regularization every once in a while. For example, in 2012 over 9500 regularization applications were submitted to the Central Office for Foreigners (OBM, 2012).; 6Pracodawcy zainteresowani zatrudnianiem Ukraińców - raport OTTO Polska [Employers are interested in hiring Ukrainians], in: *Gazeta Wrocławska*, available at: [*http://www.strefabiznesu.gazetawroclawska.pl/artykul/pracodawcy-zainteresowani-zatrudnianiem-ukraincow-raport-otto-polska*](http://www.strefabiznesu.gazetawroclawska.pl/artykul/pracodawcy-zainteresowani-zatrudnianiem-ukraincow-raport-otto-polska), accessed 27 July 2015.

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[***Biases in multicriteria decision analysis: The case of environmental planning in Southern Nevada***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:6BGY-HK51-JBMY-H3M6-00000-00&context=1516831)

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**ABSTRACT**

Multicriteria decision analysis is a decision support aid touted for its ability to help participants overcome bias and make holistic assessments. However, few offer empirical tests of this thesis. This research examines the use of multicriteria decision analysis to implement the Southern Nevada Public Lands Management Act. The Act called upon federal, regional, and local agencies to develop a connected system of parks, trails, and natural areas throughout Nevada. The partners used multicriteria decision analysis to make decisions about which parks, trails, and natural areas projects to fund. We assess the extent of political and cognitive biases among the participants when using the multicriteria decision analysis process. We find no strong evidence of strategic behavior, a finding that highlights many of the celebratory claims made about multicriteria decision analysis. However, we also note a preference for projects adjacent to high-income areas as well as the presence of cognitive biases in the assignment of scores to projects.

**FULL TEXT**

Multicriteria decision analysis (MCDA) is a decision aid and support tool. It is a procedure that when used by decision makers can help to ensure that they identify and evaluate alternatives on multiple explicit objectives to arrive at more rationally defensible decisions. MCDA is increasingly being promulgated as a tool for policy making in settings where participants have diverse preferences (Banville et al., 1998; Hajkowicz, 2008; Macharis and Nijkamp, 2013; Munda, 2004; Zionts and Wallenius, 1983). While there are a large number of approaches and algorithms, participatory MCDA fundamentally involves four basic steps: (1) convene relevant stakeholders around an issue, (2) design a set of criteria upon which relevant alternatives to an issue can be evaluated, (3) evaluate those alternatives, and (4) aggregate the rankings into a recommendation.

MCDA as a decision aid took root in the 1950s and 1960s with great strides being made throughout the 1970s (Wallenius and Zionts, 2011) in developing advanced mathematical algorithms (Benayoun et al., 1971; Geoffrion et al., 1972) and refined theory and processes (Keeney and Raiffa, 1976). Such developments laid the groundwork for its increasingly common use in policy-making exercises today. MCDA, in contemporary applications, has been touted for its ability to unite multiple and conflicted constituencies (Banville et al., 1998; Beinat and Nijkamp, 1998; Janssen and Munda, 1999; Kersten et al., 1988; Munda, 2004; Romero and Rehman, 1989), help participants to overcome individual biases, and promote holistic assessment (Belton and Stewart, 2002; De Brucker et al., 2013; Hajkowicz, 2012; Keeney and Raiffa, 1976; Kersten et al., 1988; Van Delft and Nijkamp, 1977).

Despite continued development, the approach has numerous critics. Problems of incommensurability, uncertainty, and bounded rationality have all been discussed in the academic literature on MCDA (Keeney and Raiffa, 1976; Shakun, 2001; Stewart, 2005; Wenstøp, 2005). As MCDA becomes more common in practice, there are other ways the approach might fail key tests of rationality, with potentially troubling results for policy applications. Following developments in behavioral decision theory (Slovic et al., 1977) and similar work, there has been rising concern that participants may be prone to decision biases when applying MCDA in real-life policy-making situations (Bansback et al., 2014; Hajkowicz, 2012; Montibeller and Von Winterfeldt, 2015; Munda, 1993; Von Winterfeldt and Edwards, 1986). In a recent text on the history of MCDA, the editors argue that research exploring behavioral realism in applications of MCDA is significantly underdeveloped (Wallenius and Zionts, 2011). To date, the MCDA literature largely consists of case descriptions or advances in computational methods (Huang et al., 2011; Mendoza and Martins, 2006). While systematic reviews have been undertaken in a variety of domains (see, for example, Estévez and Gelcich, 2015; Huang et al., 2011; Mendoza and Martins, 2006; Soltani et al., 2015; Wahlster et al., 2015), few studies seek to understand behavior in natural uses of MCDA or provide models of the behavior of decision makers in the MCDA process (Banville et al., 1998; Huang et al., 2011; Von Winterfeldt and Edwards, 1986). In other words, while we know a good deal about the process and output of MCDA, there has been less attention to the inputs—how actors behave when providing evaluations of items in an MCDA process. As the use of MCDA spreads (Monnikhof and Bots, 2000) we should ask whether or not the approach lives up to its expectations in practice.

In this paper, we utilize ***data*** from a real-world use of MCDA to study the effect of strategic and cognitive biases on participants' inputs into the process. Unlike many other papers on MCDA, our focus is neither to present a new methodology nor to explain an MCDA process undertaken by ourselves. Rather, the objective is to test ***data*** taken from a policy-making exercise that used MCDA to assess the presence and extent of biases by the actors involved. We ask, does MCDA help overcome the individual biases present in many decision-making environments? If such biases are present, this would provide evidence that methods development in MCDA must consider not only appropriate ways to aggregate interests, but also techniques for addressing these biases, such as those suggested by Bansback et al. (2014).

There are two key biases with which we are concerned. First, strategic bias, defined within the context of this study as opportunistic behavior by actors in the MCDA process to increase the likelihood of capturing resources for their agency and its constituents (Hajkowicz, 2012; Williamson, 1981). For example, a representative of an agency in the MCDA process might inflate the scores of their own projects to increase the likelihood they will be funded. Drawing on the theories of political economy (Wamsley and Zald, 1973; Williamson, 1981) and resource dependency (Pfeffer and Salancik, 1978), strategic behavior by participants, particularly in resource allocation decisions (Oliver, 1991), is likely and even legitimate given the political environment in which public servants operate. As Roy (2005) points out in relation to MCDA, even those who claim to act objectively may, in fact, be consciously or unconsciously seeking to find solutions that fit their viewpoint. If MCDA fails to address strategic bias effectively there is a risk that the results of the procedure could be biased in favor of powerful interests (Montibeller and Winterfeldt, 2015).

The second behavioral consideration we test for is cognitive bias. Research in behavioral decision theory (Slovic et al., 1977) suggests trivial changes to the scoring instrument could result in meaningful changes in scores as a result of anchoring (Jacowitz and Kahneman, 1995; Kahneman, 1992; Tversky and Kahneman, 1974) or halo effects (Asch, 1946; Forgas, 2011; Murphy et al., 1993), both examples of the serial position effect (Crano, 1977). If MCDA fails to address cognitive biases there is no guarantee that the outcome of the procedure is defensibly rational (Montibeller and Winterfeldt, 2015).

The next section of this paper provides some background information on the case in which we explore MCDA—The Parks, Trails and Natural Areas Subgroup (PTNA) of the Southern Nevada Public Lands Management Act (SNPLMA). We then introduce the literatures that ground our study, including political economy, resource dependency, and the psychology of evaluation before presenting our ***data*** and findings. We conclude by considering the insights from our research for both practitioners and scholars interested in the application of MCDA.

**Research context: The SNPLMA of 1998**

We examine a novel case of the use of MCDA that arose from the passage of The SNPLMA of 1998 (Public Law 105 U.S. 263). In the 1990s, a population boom and consequent increase in demand for land created a potentially significant revenue opportunity from the sale of public land around the Las Vegas metropolitan area. SNPLMA authorized the sale of federal public lands with the provision that any revenues generated were to be used for a variety of conservation purposes including the development of PTNA throughout Nevada. Decisions about relevant projects were to be coordinated through the U.S. Bureau of Land Management with other federal, regional, and local government agencies.

In 2000, federal, regional, and local government agencies began using an MCDA-style process to evaluate and make funding decisions about a range of PTNA for development. In practice, local jurisdictions nominate PTNA projects by preparing three-to-five-page documents describing the proposed activity, along with its purpose and associated costs. The types of projects vary but a few project titles capture the work of PTNA: “The Las Vegas Springs Preserve, Trails and Development Projects,” “Las Vegas Wash Regional Trail,” “Wetlands Park Habitat Enhancements and Restoration,” and “El Centro Recreation Areas.” Figure 1 provides a more holistic view, presenting a network of terms mentioned at least five times in the titles of submitted projects in our ***data***. Figure 1.Network of terms from titles of Submitted SNPLMA projects. Based on words used more than 5 times in the titles of submitted projects.

Project proposals are collected by the U.S. Bureau of Land Management's Las Vegas Division (BLMLV) and redistributed to the PTNA Subgroup for initial review. The Subgroup includes representatives from the local field offices of the BLM, U.S. National Park Service, U.S. Fish and Wildlife Service, and U.S. Forest Service, alongside representatives of the water authority and sanitation district and units of local government throughout the Las Vegas Valley including, Clark County and the cities of Las Vegas, North Las Vegas, and Henderson. With the nomination documents, the BLMLV provides an evaluative scorecard, containing criteria and a scale on which to assess each project. Projects are to be scored on four categories of criteria (see Table 1): (1) *Demand*, the extent to which the project provides a new or improves an existing PTNA to meet the demands of changing demographics of residents and visitors; (2) *Resource Protection*, the degree to which the project protects or improves the integrity of environmental, cultural, historical, scientific, and open-space resources; (3) *Connectivity*, the degree to which parks, trails, and/or natural areas connect to form a more unified system; and (4) *Cost and Value*, whether project costs and benefits have been described and evaluated and steps have been taken to reduce long-term maintenance costs (Bureau of Land Management, Implementation Agreement Appendices, 2013). Table 1.Project scoring criteria.

|  |  |  |
| --- | --- | --- |
| Demand | Provides a new or improves an existing park, trail, or natural area to meet the demands and changing demographics of residents and visitors. | A. The project meets an unfulfilled demand or deficiency for parks, trails, or natural areas. B. Describes how the facility meets the needs of the target demographic. C. The project is unique and/or significant to the region it is or will be established in. D. Addresses, remedies, or improves a safety concern. |
| Resource Protection | Protects or improves the integrity of environmental, cultural, historical, scientific, and/or open space resources. | A. Significance of environmental, cultural, historical, scientific, or open space resources. B. Nature of any threat to the resource, urgency for action, and/or desired outcomes. C. The project seeks to protect or minimize impact of environmental, cultural, historical, scientific, and/or open space resources. D. Provides educational value related to resource protection. |
| Connectivity | Will connect parks, trails, and natural areas to form a more unified system. | A. Is a phase or related component to a previously approved SNPLMA project. B. Provides connectivity to a regional/local park, trail, or natural area, and/or federal lands. C. The park, trail, or natural area is part of an approved regional or local plan. (If no formal regional/local plan describes the planning process.) |
| Cost and value of investment | Evaluates, describes, and considers the costs and benefits of the project. | A. The projected budget, associated costs, and phasing considerations of the proposal are stated and justified. B. Evaluation of Public demand/use versus Investment required (i.e. service of areas/radius, communities benefitted). C. Design or approach of project minimizes future maintenance and/or replacement costs to the extent possible for the type of project. D. Partnerships and value of contribution to the project (i.e. financial, volunteerism). |

*Source*: PTNA Subgroup scorecards for Round 8 provided to the authors in 2011.

Next, the representatives from each agency meet in person. Each local government presents the projects they would like to be considered for funding in a given year. Some discussion is had among the participants about each project. After the presentations, representatives from each agency evaluate each project on the criteria. They share the scores given to each project with one another. The BLMLV then sums the scores given to projects across all evaluators. The result is a rank of projects based on the sum of scores that are used to make recommendations about which projects should be funded in any one year.

The MCDA process has been repeated every year since 2000 and is ongoing still today. To date, about $1 billion in projects have been funded this way (Bureau of Land Management, SNPLMA Revenues and Expenditures, 2014). Due to limitations of ***data*** availability, we examine the projects evaluated between 2006 and 2011 (n=193). Figure 2 summarizes the scores given to projects by location throughout the region. Figure 2.SNPLMA mean project scores. Basemap from OpenStreetMap.

**Promise and limitations of MCDA**

MCDA methods, in their application to environmental planning and policy making, developed from an increased awareness and concern that many planning efforts fail to recognize the connectivity and multidimensionality of environmental problems. As Van Delft and Nijkamp (1977) put it, “It is increasingly being realized that public planning is an *interdependent* process in a broader framework of societal well-being and economic motives” (page 3, original emphasis). For these authors, MCDA methods were seen as a, … new opportunity to arrive at a balanced analysis of all facets of modern planning problems particularly because many intangibles like social effects and environmental repercussion can be taken into account. Another advantage of these methods is that hierarchical decision levels and differences in priority structures of different groups can be integrated well. (Van Delft and Nijkamp, 1977: 4)The positive aspects of the MCDA decision framework are frequently noted in contemporary research efforts, as well (Belton and Stewart, 2002, 2010; Kiker et al., 2005; Saarikoski et al., 2013). The literature is replete with claims that the application of MCDA results in a wide range of positive outcomes including reducing conflict, creating consensus, promoting social learning, and leading to the adoption of acceptable and sustainable decisions (Hobbs and Meier, 2000). Some of the most well-documented benefits of using MCDA are transparency (Banville et al., 1998; Bouyssou, 1990; Hajkowicz, 2008; Munda, 2004; Munda et al., 1994; Stewart, 2005; Tony et al., 2011), inclusiveness (Banville et al., 1998; Hajkowicz, 2008; Marttunen et al., 2013; Munda, 2004; Zionts and Wallenius, 1983), and formalization of the decision process (Belton and Stewart, 2002, 2010; De Brucker et al., 2013; Hajkowicz, 2007, 2012; Keeney and Raiffa, 1976; Kersten et al., 1988; Mendoza and Martins, 2006; Podinovski, 2002; Roy, 1993; Van Delft and Nijkamp, 1977). Generally, it is believed that a formal, systematic process such as MCDA helps individuals to identify and make transparent their preferences. This process should allow participants to engage in dialogue, relax their entrenched positions, and embrace systems thinking to develop effective and integrative policy solutions.

While MCDA has many worthy attributes as a process for participative decision making, it has its critics, as well. Two of the often cited, although underexplored, issues with the process concern strategic and cognitive bias (Banville et al., 1998; Huang et al., 2011; Von Winterfeldt and Edwards, 1986). Here we echo critics' charges that MCDA may not be free from subjectivity and rent-seeking behavior. We outline these arguments before turning to our ***data*** to test the extent to which we observe these problems in our case of interest.

**Strategic bias**

Environmental project evaluation can generate controversy because of its distributional consequences (Costa and Carlos, 2001; Hajkowicz, 2007; Roy, 2005). Evaluating and funding projects entails making difficult choices and trade-offs; not all projects can be adopted, so there are often winners and losers. Such distributional consequences may motivate evaluators to act strategically, evaluating projects based on individual preferences and not objective and explicit goals. Such concerns are noted in the theories of political economy and resource dependency and have also been noted in practical applications of MCDA (Bennett, 2005; Hajkowicz, 2009, 2012; Monnikhof and Bots, 2000; Vetschera, 2005). The political economy literature suggests that the condition of finite resources is ubiquitous in modern governance creating competition among governments (Bowman, 1988; Le Grand, 2009; Logan and Molotoch, 1987; Molotch, 1976; Tiebout, 1956). This may be especially true among local governments who are especially responsive to their citizens because of their physical proximity (Dunn and Legge, 2001; Goetz, 1994) and may be motivated to attract public investment as part of a competitiveness strategy (Bowman, 1988; Burger et al., 2013; Lauermann, 2014; While et al., 2013). It can be in the interest of agencies, their constituencies, and themselves to assure and capture resources (Pfeffer and Salancik, 1978). Such stakes may make it difficult for participants to relax their preferences and act collectively (Ostrom, 1990; Williamson, 1981). These considerations lead naturally to our first hypothesis: **H1**: Agency representatives to the PTNA Subgroup will inflate scores for the projects they propose.Building on the same theoretical traditions, we may also expect self-interested scoring to be especially acute for jurisdictions with powerful urban elites. City elites are large contributors to the tax base and often active in politics (Logan and Molotoch, 1987; Molotch, 1976). Local governments have been demonstrated to favor elites in the distribution of resources because actions or projects that do not produce results for powerful interests can have devastating effects for elected officials, the bureaucracy, as well as the legitimacy and sustainability of policy actions (Fleischmann, 1986; Fung and Wright, 2001; Goetz, 1994; Kamoto et al., 2013; Logan and Molotoch, 1987; Lubell et al., 2005, 2009). If local elites have the social and political power noted above, organizations might be expected to preemptively direct supplies of public amenities in their direction. Park and open space improvements, specifically, provide amenity value to residents and boost property values (Anderson and West, 2006; Benson et al., 1998; Bolitzer and Netusil, 2000; Brander and Koetse, 2011; Crompton, 2005; Morancho, 2003; Troy and Grove, 2008). In addition, affluent individuals may be better equipped to agitate for improvements or mobilize social networks to maintain environmental amenities in the face of declining public expenditure (Babcock and Siemon, 1985; Fung and Wright, 2001). These factors help to explain the inequitable distribution of urban environmental amenities noted elsewhere (Byrne et al., 2009; Comber et al., 2008; Heynen et al., 2006; Landry and Chakraborty, 2009; Perkins, 2010).These observations inform our second hypothesis: **H2**: Agency representatives to the PTNA Subgroup will inflate the scores of projects located in affluent areas.

**Cognitive bias**

In addition to these salien political incentives which may lead to strategic bias, MCDA participants may also be prone to an array of decision biases as the approach cannot fully negate human psychology (Buchanan and Corner, 1997; Montibeller and Winterfeldt, 2015; Morton and Fasolo, 2009). Here we are particularly interested in a family of cognitive biases known as serial position effects (Crano, 1977). The serial position effect refers to a tendency of subjects to evaluate new information in light of previous information, even if there is no logical connection between the two pieces of ***data*** (Asch, 1946).

In one of the prominent early experiments in this literature, Asch (1946) gave subjects one of the following two lists of words describing a fictitious person: intelligent—industrious—impulsive—critical—stubborn—envious;envious—stubborn—critical—impulsive—industrious—intelligent. The list of traits differed only in their order, yet subjects in the second group were much less likely to believe the person described possessed positive personality traits, compared to subjects in the first group. This is somewhat different from the closely related primacy effect (Lund, 1925), in which subjects are more likely to believe information that is presented to them first (Crano, 1977; Nahari and Ben-Shakhar, 2012).

One manifestation of the serial position effect is the tendency for subjects to engage in anchoring. The term anchor, as used here, refers to some (potentially arbitrary) value that the subject considers before making a numerical estimate, which then biases subsequent estimates, moving them toward the anchoring value (Jacowitz and Kahneman, 1995). Anchors are important to consider in the MCDA process because the task of making a quantitative assessment of each item is complex (Wilson and Brekke, 1994; Wilson et al., 1996), particularly in a case like ours where many of the criteria considered (such as Demand and Resource Protection) do not have clear quantitative scales upon which respondents might rely. Kahneman (1992) suggests that an anchor helps subjects to simplify such complex tasks by allowing the subject to adjust the scale on which they consider an item. While this can ease cognitive burdens, anchoring can also lead to biased results. The problem is that the anchor changes the subject's perception of the endpoints of the scale, resulting in a correlation between evaluations and irrelevant or trivial information (Parducci, 1974). An explanation for this phenomenon is that the anchor increases availability of anchor-consistent information, biasing judgments toward the anchoring value (Mussweiler et al., 2000; Strack and Mussweiler, 1997). Anchoring effects have been observed in a wide variety of natural settings, such as estimates of property values (Northcraft and Neale, 1987), art auctions (Beggs and Graddy, 2009), university ranking systems (Bowman and Bastedo, 2011), and courtrooms (Chapman and Bornstein, 1996).

A second version of serial positioning is the “halo effect,” most prominently identified by the Solomon Asch (1946) study described above. The halo effect refers to the tendency of overall evaluations or impressions to color the interpretation of a person, object, or issue being judged (Nisbett and Wilson, 1977). When information is acquired sequentially, the halo effect can result in initial information having a strong influence on subsequent interpretations. Kahneman (2011) provides an excellent example, one we imagine many of us are familiar: Early in my career as a professor, I graded students' essay exams in the conventional way. I would pick up one test booklet at a time and read all that student's essays in immediate succession, grading them as I went. I would then compute the total and go on to the next student. I eventually noticed that my evaluations of the essays in each booklet were strikingly homogeneous. I began to suspect that my grading exhibited a halo effect, and that the first question I scored had a disproportionate effect on the overall grade. The mechanism was simple: if I had given a high score to the first essay, I gave the student the benefit of the doubt whenever I encountered a vague or ambiguous statement later on. (83)Halo effects have been documented in a variety of cases, including instructor ratings (Nisbett and Wilson, 1977), risk auditing (O'Donnell and Schultz, 2005), evaluation of arguments (Forgas, 2011), healthcare decisions (Bansback et al., 2014), valuation of foods (Lee et al., 2013), and numerous other examples (Murphy et al., 1993). Like anchoring effects, halo effects also have been documented in both expert and nonexpert subjects (Hergovich et al., 2010).

Halo effects are closely related to confirmation bias, the tendency of individuals to interpret evidence “in ways that are partial to existing beliefs, expectations, or a hypothesis in hand” (Nickerson, 1998: 175). In other words, once a reviewer has fixed upon an active hypothesis (e.g. that the project under consideration is a “good” or “bad” project), subsequent evaluations are likely to be made in light of this assessment. Experimental research has suggested that the effect is heightened when information is revealed sequentially, as sequencing focuses attention on the previous decision (Jonas et al., 2001). As we discuss below, our ***data*** unfortunately do not allow us to distinguish between halo and anchoring effects. Nevertheless, both effects can be evidenced in higher correlations between the scores across criteria than we would expect by random chance. This leads to our final hypothesis: **H3**: Project scores across criteria will be highly correlated.The next section of this paper discusses the ***data*** that will be used to test each of the above hypotheses.

***Data***

Variables used in our model estimations are outlined in Table 2. In order to understand the scores given to projects by the participants, we first gained access to the MCDA scorecards used in the evaluation process described above. The BLMLV was contacted by phone and email several times in the first half of 2011 in order to obtain these documents. After some initial concern that we would have to file to see these documents under the Freedom of Information Act, it was decided that the documents could be released. However, anonymity for the organizations involved about certain details was ensured. We were also provided with some of the nomination documents for projects. However, many had been lost over time. Therefore, we collected additional ***data*** to help us understand the projects.

From the 362 projects assessed, 193 (53% of the total and 83% of the most recent five assessment rounds) could be geolocated for ***data*** collection (see Figure 1). To collect information about each project's neighborhood, circular buffers were constructed in 1, 2, and 5 km increments, which were in turn used to summarize the other datasets within the specified distance of the project.

Spatial ***data*** were collected on public and private land ownership (USGS National Gap Analysis Program, 2007), low, medium, and high intensity developed land cover in 2001, 2006, and 2011 (Fry et al., 2011; Homer et al., 2007; Jin et al., 2013), population change from 2000 to 2010 (US ***Census*** Bureau, 2000, 2010), and per capita income in 2010 (US ***Census*** Bureau, 2010). In addition, spatial ***data*** were assembled on local areas classified as either U.S. Fish and Wildlife Service Critical Habitat (U.S. Fish and Wildlife Service, 2015) or U.S. Bureau of Land Management Areas of Concern (Bureau of Land Management, Nevada, 2014), as well as local sites listed in the National Register of Historic Places (2014).

**Model**

We estimate Beta regression models (Cribari-Neto and Zeileis, 2010; Espinheira et al., 2008; Ferrari and Cribari-Neto, 2004) to explain the scores that individuals give the 193 geocoded projects on each of four criteria. Our outcome variables of interest are the scores given by each organization to specific projects on particular criteria (demand, resource protection, connectivity, and cost-effectiveness). In other words, we model the process by which projects receive the scores they were given.

Beta regression is appropriate for the processes we study for two reasons. First, Beta regression is designed to model nonlinear limited dependent variables on the 0–1 scale. We rescale project scores to the 0–1 scale to take advantage of the model's flexibility. Second, Beta regression can be coupled with a precision component to model changes in variation across subsets of the ***data***. This allows us to control for differences in both mean and variance of scores across respondents and time. In all the models reported here, we use a logit link function for the Beta regression and a log link function for the precision component.

Our three hypotheses correspond to three variables operationalized in the models. **H1** held that agency representatives to the PTNA Subgroup would be likely to inflate the scores of their own projects. We test this hypothesis using a binary variable indicating that the scoring organization was also the project sponsor (Own Project). **H2** held that representatives would be likely to inflate scores for projects located in affluent areas. We test this hypothesis with a variable estimating per capita income in the project area. We estimate per capita income within 2 km of each project by intersecting a 2 km buffer with ***census*** tracts and computing a weighted mean per capita income based on the proportion of the 2 km buffer area found in each ***census*** tract, using ***data*** from the 2000 ***Census***. The final measure is scaled to thousands of U.S. dollars and is logged in our model estimations (ln(Income)). **H3** suggested that projects would exhibit high intercorrelation among criteria scores. This is tested by, first, estimating baseline models using controls outlined below for each criterion. Residuals from these baseline models are saved and then included as explanatory variables in our final models (demand residuals, resource protection residuals, connectivity residuals, and cost residuals). As noted above, this approach allows us only to assess the presence of correlations between the scores on each criterion, which means we cannot distinguish between the halo and anchoring effects, but provides evidence of cognitive bias more generally.

Given that project quality should also affect project scores, we include a range of control variables based on objectively measured project characteristics. First, we include measures of population and population change as a proxy for demand. Due to its sparse population, even ***census*** blocks can be quite large in Nevada, making the estimation of local population challenging. To provide more precise estimates, ***census*** blocks for 2000 and 2010 were intersected with developed areas as of 2001 and 2011, respectively. The population of each block was assigned to the resulting polygons weighted by their development density, with low density areas weighted 0.3, medium density 0.65, and high density 0.9. We then constructed 1 km buffers surrounding each project. Within the project buffers, population values were assigned proportional to development density. Estimated populations for all polygons in a project's neighborhood were summed to estimate the population in the area of the project. Estimated population for 2010 was subtracted from the estimated population for 2000 to compute a measure of population change (population change). The downscaling procedure was repeated for a 2 km buffer and the mean of the 2 km neighborhood populations in 2000 and 2010 was computed as an estimate of demand (Population 2005).

A second set of control variables proxy for resource protection. First, we compute the distance, in kilometers, from each project to areas classified as either U.S. Fish and Wildlife Service Critical Habitat (U.S. Fish and Wildlife Service, 2015) or U.S. Bureau of Land Management Areas of Concern (Bureau of Land Management, Nevada, 2014) (Environmental Resource Distance). Second, we compute the total number of sites from the National Register of Historic Places (2014) within 2 km of each project (Historical Resources).

A third set of variables controls for connectivity. First, we compute the total area, in square kilometers, within 2 km of each project controlled or serviced by the Bureau of Land Management as a regional park (Managed). Second, we include a binary variable to indicate that a project extends beyond the boundaries of a local government if it was stated in the project descriptions (Leave Bounds). Finally, we consider the role of each project in an overall regional plan by including a count of the total number of previous projects within 5 km that have been applied for in the PTNA category of SNPLMA (Projects 5KM).

Lacking a clear way to estimate the cost effectiveness of a project, we include the amount of funds requested in U.S. dollars in millions (Funds). We also control for the fact that many PTNA projects were developed in phases. We assume that participants see value in completing phased projects and thus include a variable counting the current phase of all projects, with unphased projects set to zero (Phase).

Lastly, we estimate a number of separate intercepts: for project proponents that were also scoring organizations (Organization B, C, D); for all other organizational proponents (Organization Other); for each organizational scorer (Respondents B, C, D, J, K, L, M, and N); for each project round (Round 7, 8, 9, 10, 11); and for projects located in Clark County (Clark). Taking advantage of the precision component of the Beta regression model, we also include a series of control variables to model the precision of the estimate across stakeholders and rounds, labeled as in the mean component of the model. All models were estimated using the betareg package (Cribari-Neto and Zeileis, 2010) in R 3.2.3 (R Core Team, 2015).

**Results**

Model estimations are presented in Tables 3 (baseline models) and 4 (models with residuals). To aid in interpretation, Table 5 presents odds ratio calculations for the coefficients estimated in the final models. By design, there are only minor differences between the coefficient estimates for variables in both baseline and final models. We focus on the final estimated models in our discussion, beginning with a discussion of our key hypotheses and then proceeding to discuss some of the control variables. For ease of interpretation, all our substantive analyses of coefficients are expressed in terms of a percentage change at the mean for each dependent variable with a one unit increase in the independent variable. Table 2.Summary ***statistics*** of variables used in model estimation (N=816).

| **Variable** | **Mean** | **Standard deviation** | **Minimum** | **Maximum** |
| --- | --- | --- | --- | --- |
| Demand (SNPLMA ***Data***) | 0.671 | 0.186 | 0.112 | 1 |
| Resources (SNPLMA ***Data***) | 0.570 | 0.214 | 0.001 | 1 |
| Connectivity (SNPLMA ***Data***) | 0.560 | 0.243 | 0.001 | 1 |
| Cost (SNPLMA ***Data***) | 0.658 | 0.215 | 0.001 | 1 |
| Own project (SNPLMA ***Data***) | 0.078 | 0.269 | 0 | 1 |
| Income (US ***Census*** Bureau, 2010) | 27.1 | 11.5 | 13.2 | 67.7 |
| Population change (US ***Census*** Bureau, 2000, 2010) | 3490 | 5050 | −3450 | 19,900 |
| Population 2005 (US ***Census*** Bureau, 2000, 2010) | 10,500 | 10,700 | 0 | 35,100 |
| Environmental resource distance (US Fish and Wildlife Service, 2015; Bureau of Land Management, Nevada, 2014) | 10.0 | 8.79 | 0 | 51.9 |
| Historical resources (National Register of Historic Places, 2014) | 0.428 | 0.967 | 0 | 4 |
| Managed (USGS National Gap Analysis Program, 2007) | 3.22 | 3.35 | 0 | 12.4 |
| Leave bounds (SNPLMA ***Data***) | 0.375 | 0.484 | 0 | 1 |
| Projects 5KM (SNPLMA ***Data***) | 5.324 | 5.486 | 0 | 27 |
| Funds (SNPLMA ***Data***) | 5.60 | 8.19 | 0.175 | 41 |
| Phase (SNPLMA ***Data***) | 1.41 | 1.27 | 0 | 3 |
| Clark County (SNPLMA ***Data***) | 0.710 | 0.454 | 0 | 1 |

Table 3.Estimated baseline models (N = 816).

| **Variable** | **Demand (std. error)** | **Resources (std. error)** | **Connectivity (std. error)** | **Cost (std. error)** |
| --- | --- | --- | --- | --- |
| Intercept | 0.753 | −0.800 | −2.49\*\*\* | 0.338 |
| (0.516) | (0.473) | (0.557) | (0.526) |  |
| Own project | −0.357\*\* | −0.218 | −0.333\* | −0.709\*\*\* |
| (0.113) | (0.116) | (0.141) | (0.132) |  |
| ln(Income) | 0.373\*\* | 0.527\*\*\* | 1.22\*\*\* | 0.353\*\* |
| (0.123) | (0.127) | (0.152) | (0.136) |  |
| Population change^ | −0.0314 | −0.0364 | −0.0378 | 0.0441 |
| (0.0386) | (0.0391) | (0.0468) | (0.0430) |  |
| Population 2005^ | −0.0957 | −0.244\*\*\* | 0.162\* | −0.150\* |
| (0.0579) | (0.0583) | (0.0726) | (0.0637) |  |
| Environmental resource distance | 0.00895\* | −0.00236 | −0.0163\*\*\* | 0.0249\* |
| (0.00391) | (0.00385) | (0.00486) | (0.0105) |  |
| Historical resources | 0.0987\* | 0.0689 | 0.231\*\*\* | 0.215\*\*\* |
| (0.0449) | (0.0452) | (0.0549) | (0.0505) |  |
| Managed^ | −0.199\*\*\* | −0.152\*\* | 0.145\* | −0.00839 |
| (0.0482) | (0.0489) | (0.0581) | (0.0538) |  |
| Leave bounds | −0.0358 | 0.100 | 0.301\*\*\* | −0.0815 |
| (0.0686) | (0.0691) | (0.0858) | (0.0756) |  |
| Projects 5KM | 0.0190\* | 0.0389\*\*\* | 0.0377\*\* | 0.0249\* |
| (0.00961) | (0.00988) | (0.0116) | (0.0105) |  |
| Funds^ | −0.209\*\*\* | −0.230\*\*\* | −0.0576 | −0.226\*\*\* |
| (0.0436) | (0.0445) | (0.0514) | (0.0510) |  |
| Phase | 0.0476 | 0.149\*\*\* | 0.417\*\*\* | −0.004 |
| (0.0284) | (0.0284) | (0.0351) | (0.0315) |  |
| Clark County | −0.338\* | −0.00407 | −0.547\*\* | −0.123 |
| (0.159) | (0.166) | (0.190) | (0.178) |  |
| Factors | Proposers c, d; all rounds; respondents j, k, and l | Proposers c, d, and other; all rounds; respondents j and l | Proposers b, d, and other; all rounds; respondents j, l, and m | Proposer d; respondents d, j, k, l, m, n |
| Precision factors | Respondents c, j, l, and n; all rounds | Respondents l and n; rounds 7, 8, 9, 10, 11 | Respondents b and l; round 9 | Respondents b, d, k, l, and n; all rounds |
| Pseudo-R2 | 0.182 | 0.207 | 0.367 | 0.156 |

\*= sig. at 0.05;\*\*= sig. at 0.01;\*\*\*= sig. at 0.01.^= variable scaled to standard deviations.Table 4.Estimated final models (N=816).

| **Variable** | **Demand (std. error)** | **Resources (std. error)** | **Connectivity (std. error)** | **Cost (std. error)** |
| --- | --- | --- | --- | --- |
| Intercept | 0.861 | −0.913\* | −2.57\*\*\* | 0.426 |
| (0.473) | (0.433) | (0.551) | (0.487) |  |
| Own project | −0.312\*\* | −0.214\* | −0.334\* | −0.693\*\*\* |
| (0.104) | (0.107) | (0.141) | (0.120) |  |
| ln(Income) | 0.351\*\* | 0.560\*\*\* | 1.23\*\*\* | 0.338\*\* |
| (0.108) | (0.113) | (0.150) | (0.123) |  |
| Demand residuals |  | 0.212\*\*\* | 0.0142 | 0.303\*\*\* |
|  | (0.0256) | (0.0328) | (0.0291) |  |
| Resource residuals | 0.227\*\*\* |  | 0.146\*\*\* | 0.258\*\*\* |
| (0.0264) |  | (0.0347) | (0.0294) |  |
| Connectivity residuals | 0.0399 | 0.0863\*\*\* |  | 0.0176 |
| (0.0219) | (0.0218) |  | (0.0246 |  |
| Cost residuals | 0.262\*\*\* | 0.239\*\*\* | 0.0175 |  |
| (0.0259) | (0.0255) | (0.0339) |  |  |
| Population change^ | −0.0243 | −0.038 | −0.0268 | 0.0531 |
| (0.0343) | (0.0345) | (0.0461) | (0.0389) |  |
| Population 2005^ | −0.0906 | −0.239\*\*\* | 0.174\* | −0.126\* |
| (0.0516) | (0.0523) | (0.0722) | (0.0582) |  |
| Environmental resource distance | 0.00811\* | −0.00114 | −0.0177\*\*\* | 0.000217 |
| (0.00355) | (0.00348) | (0.00483) | (0.00401) |  |
| Historical resources | 0.0726 | 0.0626 | 0.266\*\*\* | 0.204\*\*\* |
| (0.0397) | (0.0400) | (0.0541) | (0.0456) |  |
| Managed^ | −0.186\*\*\* | −0.139\*\* | 0.164\*\* | −0.00485 |
| (0.0426) | (0.0430) | (0.0573) | (0.0483) |  |
| Leave bounds | −0.0676 | 0.0440 | 0.307\*\*\* | −0.111 |
| (0.0617) | (0.0618) | (0.0853) | (0.0690) |  |
| Projects 5KM | 0.0191\* | 0.0383\*\*\* | 0.0334\*\* | 0.0217\* |
| (0.00845) | (0.00878) | (0.0114) | (0.00946) |  |
| Funds^ | −0.211\*\*\* | −0.260\*\*\* | −0.0591 | −0.244\*\*\* |
| (0.0393) | (0.0378) | (0.0506) | (0.0487) |  |
| Phase | 0.0621\* | 0.164\*\*\* | 0.412\*\*\* | 0.0138 |
| (0.0254) | (0.0251) | (0.0347) | (0.0285) |  |
| Clark County | −0.401\*\* | −0.0209 | −0.486\*\* | −0.160 |
| (0.138) | (0.144) | (0.186) | (0.159) |  |
| Factors | Proposers c and d; all rounds; respondents d, j, k, l, and n | Proposers c, d, and other; all rounds; respondents j and l | Proposers b, d, and other; all rounds; respondents j, l, and m | Proposer d; respondents d, j, k, l, m, and n |
| Precision factors | Respondents j, l, and n; all rounds | Respondents l, m, and n; rounds 7, 8, 9, and 10 | Respondents k and l; round 9 | Respondents b, k, and l; all rounds |
| Pseudo-R2 | 0.360 | 0.355 | 0.370 | 0.333 |

\*= sig. at 0.05;\*\*= sig. at 0.01;\*\*\*= sig. at 0.01.^= variable scaled to standard deviations.Table 5.Estimated final model odds ratios.

| **Variable** | **Demand** | **Resources** | **Connectivity** | **Cost** |
| --- | --- | --- | --- | --- |
| Own project | 0.732 | 0.807 | 0.716 | 0.500 |
| ln(Income) | 1.42 | 1.75 | 3.44 | 1.40 |
| Demand residuals |  | 1.24 | 1.01 | 1.35 |
| Resource residuals | 1.25 |  | 1.16 | 1.29 |
| Connectivity residuals | 1.04 | 1.09 |  | 1.02 |
| Cost residuals | 1.30 | 1.27 | 1.02 |  |
| Population change^ | 0.976 | 0.963 | 0.974 | 1.05 |
| Population 2005^ | 0.913 | 0.788 | 1.19 | 0.882 |
| Environmental resource distance | 1.01 | 0.999 | 0.982 | 1.00 |
| Historical resources | 1.08 | 1.06 | 1.31 | 1.23 |
| Managed^ | 0.830 | 0.870 | 1.18 | 0.995 |
| Leave bounds | 0.935 | 1.04 | 1.36 | 0.895 |
| Projects 5KM | 1.02 | 1.04 | 1.03 | 1.02 |
| Funds^ | 0.810 | 0.401 | 0.943 | 0.784 |
| Phase | 1.06 | 1.18 | 1.51 | 1.01 |
| Clark County | 0.669 | 0.979 | 0.615 | 0.852 |

^= variable scaled to standard deviations.

**H1** suggested that agency representatives to the PTNA Subgroup would be likely to inflate their own project scores. The hypothesis is rejected on the basis of the evidence. In fact, we find the opposite. Respondents' scores for their own projects, across all criteria, are lower than scores they give to other agencies. At the mean for each criterion, respondents would score their own projects 10% lower for demand, 14% lower for resource protection, and 15% lower for connectivity. This effect rises to 25% for cost effectiveness.

**H2** held that respondents would inflate scores of projects located in high-income areas. We find statistically and substantively significant positive effects for income across all criteria. For the case of demand and cost effectiveness, relative to their respective means, a 1% increase in per capita income can be expected to increase scores about 11% and 11%, respectively. A 1% increase in per capita income for resource protection increases scores about 23%, and for connectivity, 45%.

**H3** suggested that scores will be highly correlated across criteria. We find mixed support for this hypothesis. We find that a perfect score for demand is associated with a 9% and 10% increase in the scores given a project on the criterion of resource protection and cost effectiveness. However, the effect is less pronounced for connectivity scores, which only have a statistically significant relationship to resource protection scores. A perfect resource protection score would be estimated to increase a project's connectivity score by 6%, at the mean.

As noted above, these results do not allow us to distinguish between the anchoring and halo effects, as it is not possible to determine the direction of causality (or, for that matter, the order in which the items were filled out). The findings are, however, suggestive of cognitive bias, given that controls for relevant project characteristics are present. It is also noteworthy that demand, resource protection, and cost effectiveness, arguably more subjective measures than connectivity, show considerable correlation in scores.

Control variables generally have effects in the expected directions, although in some cases these are not statistically or substantively significant. Surprisingly, population has no statistically significant effect on demand scores, negative effects on resource protection and cost effectiveness, and a positive effect on connectivity. At the mean, a standard deviation increase in population leads to a 10% reduction in resource protection scores and a 4% reduction in cost effectiveness scores, but an 8% increase in connectivity scores. The positive relationship between population and connectivity scores could be reflective of projects that provide new connectivity across the urban gradient of Las Vegas. The negative effect of population on resource protection scores, while more puzzling, may reflect a belief that urban areas cannot also have significant natural resource value (Bryant, 2006) or the existence of a stronger appreciation for resource protection in more rural settings (Ryan, 2002). The negative effect of population on cost and value scores may have to do with the higher costs of land and maintenance in more densely populated areas. Population change had no significant effects on any of the criteria scores.

Distance from important environmental resources, one of the measures used to capture resource protection, is found to be significant for demand and resource protection scores, but the effect is substantively small. Proximity to sites on the National Registry of Historic Sites, however, is associated with substantively significant positive effects on connectivity and cost effectiveness. Proximity to each additional site is expected to increase scores by 12% and 7%, respectively. Managed areas have similarly mixed effects. A standard deviation increase in managed areas within 2 km of a project is expected to be associated with a 7% reduction in demand scores, an 8% reduction in resource protection scores, and a 7% increase in connectivity scores, all at the mean. This could reflect respondents' assessments that the value of additional PTNA decreases with the existence of managed spaces in the area, while acknowledging that projects in these areas significantly increase connectivity to large managed sites.

Projects that leave an agency's jurisdictional boundaries tend to receive higher connectivity scores, as expected, but this variable has no statistically significant effect on the other criteria. The number of projects within 5 km does tend to increase scores for projects across all criteria; however, the effects are substantively weak.

As might be expected, more expensive projects appear to be subject to greater scrutiny. At the mean, a standard deviation increase in the funds requested for a project leads to a 8% reduction in demand, a 39% reduction in resource protection, and a 9% reduction in cost effectiveness scores, at the mean. Projects with multiple phases receive an increase in scores across all categories, with a 2% increase in demand, a 7% increase in resource protection, and a 17% increase in connectivity scores for each subsequent phase of a project, at the mean. Finally, projects based in Clark County, where approximately 75% of the projects are located, are expected to be scored 14% lower on demand, 22% lower on connectivity, and 6% lower on cost effectiveness than projects located outside the county. Only a small number of projects were proposed by units of local government on the periphery of the Las Vegas Valley; however, it seems when they did propose projects they were given ample consideration.

**Discussion**

Our results provide mixed lessons about the use of MCDA to inform policy making. Most notably, we do not find evidence of self-interested strategic behavior among the evaluators. In fact, we find the opposite. Relevant literature reviewed suggested that members of the PTNA Subgroup should be motivated to distort their evaluations of projects in order to increase the likelihood of having their own projects funded (Hajkowicz, 2009, 2012). There is no evidence of organizations inflating the scores of their own projects. Instead, we see the participants finding value in projects that are outside their own jurisdiction. This finding may be a testament to the efforts of the participants as well as the process used. While our evidence does not allow us to confirm what elements of the process may have been helpful in decreasing the incentives for strategic behavior, the literature on MCDA offers some guidance. Meeting face to face to discuss projects proposals should help to insure understanding, awareness, and support, possibly leading to more accommodating participants (Belton and Pictet, 1997). The group examined here did meet face to face to discuss and evaluate projects. Also, the transparency of the process, scoring the projects in a public setting, may decrease opportunistic incentives and increase the accountability of agents to the process and other participants (Bennett, 2005; Hajkowicz, 2007, 2012; Monnikhof and Bots, 2000; Vetschera, 2005). In this case, participants did share their scores with others in the process. Finally, the availability of resources in this case was significant. Las Vegas during the time periods explored in this analysis had a significant population boom that was reflected in the large number and high prices for the parcels of land sold. The high value for land insured ample funds for the development of PTNA. For example, in some of the early years all of the projects that were proposed were funded. However, the amount of resources has declined in recent years. Still, the availability of resources may render competitive pressures less of an issue. Generally, we believe our analysis demonstrates that this group was able to use the MCDA framework to help guide decision making toward collective goals. For example, that projects near historical sites increase connectivity scores is indicative of the goal of this initiative—develop a regional, connected, system of PTNAs. Our findings showcase the ability of MCDA to help individuals to consider the common good.

Yet our results also raise some potential concerns. Most notably, we find evidence that the planning and development of open space and amenities favors wealthier citizens. This finding was expected on the basis of the political economy literature regarding government preferences in the development and protection of land (Heynen et al., 2006; Landry and Chakraborty, 2009; Logan and Molotoch, 1987; Lubell et al., 2005; Molotch, 1976). While we cannot discern if this finding was a purposeful and strategic act or a deeply entrenched bias, noting that it exists is critical because MCDA processes can be structured to overcome such distortions. When biases, assumptions, or deficits in thinking are made explicit, the process can be reconfigured, building in new criteria or changing the weighting mechanisms, to reduce their impact (see, for example, Bansback et al., 2014). Future research may wish to discern the extent to which the bias toward city elites occurs in other applications of MCDA and if governments are cognizant of this bias, in addition to continuing to identify other possible political biases and prescribing criteria and weighting mechanism that can reduce these behaviors.

We also find evidence that cognitive biases distorted project scores in this case. Projects that received high scores on the criteria of demand increased scores on resource protection and cost effectiveness, controlling for relevant project characteristics. In other words, relationships exist in the scoring patterns among evaluators across criteria even though the criteria are intended to measure distinct items. Unfortunately, our case does not allow us to determine whether this finding is due to halo or anchoring effects, or perhaps a combination of the two. Controlled experiments are one means that could be used to assess the impact of both forms of serial position effects, in addition to testing possible solutions. Experimental research could lead to simple and effective approaches for reducing the effects of cognitive bias. This is particularly important given that cognitive biases may magnify other distortions—such as the income effect noted above—and could have particularly pernicious effects unless proper controls are put in place. We also note the effect of cognitive bias was limited to those criteria that are arguably less easily and objectively measured (demand, resource protection, and connectivity)—the problem of incommensurability. Thus, we believe, consistent with others, that MCDA applications to complex and value-laden policy arenas warrants greater attention and scrutiny as well as careful practice (Rauschmayer, 2001; Wenstøp, 2005).

**Conclusion**

We have noted that few studies model the behavior of decision makers in the MCDA process nor seek to understand behavior in naturally occurring settings. Such applied research can provide helpful information to the ongoing effort to develop appropriate algorithms and procedures for effective MCDA. We identified and collected ***data*** from a unique case in order to empirically determine the extent to which MCDA evaluations may be biased as a result of strategic considerations or cognitive limitations. The PTNA Subgroup of the SNPLMA evaluated numerous projects over several years to develop PTNAs. We find no strong evidence of rent-seeking behavior—a finding that highlights many of the celebratory claims made about MCDA. Still, some factors deserve a great deal more attention when considering the adoption of MCDA. We find evidence of a bias toward affluent residents as well as cognitive biases, which can significantly affect the scores given to projects and the projects ultimately selected for funding. Our results provide critical information about decision makers and the capacity of MCDA to help overcome bias and partisan differences. Based on our results, we suggest more research is necessary to identify and support the adoption of processes that can counter the cognitive and political biases evident in this case.

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[***Food Insecurity and Coping Strategies: A Tale of Two Particularly Vulnerable Tribal Groups in Karnataka***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:6BM3-50R1-JBMY-H1MP-00000-00&context=1516831)

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**Body**

**ABSTRACT**

This paper explores the food insecurity level and coping strategies of two particularly vulnerable tribal groups (PVTGs) in India. It finds that despite the availability of resources, limited income always becomes a proxy for their food vulnerability because they cannot purchase food items outside state programmes. These groups traditionally adopt various coping strategies to overcome food insecurity at household level and these have become a structure and behaviour for ensuring food security

**FULL TEXT**

**Introduction**

Food security has long been discussed across the globe, largely in terms of the availability, accessibility and utilisation as defined and adopted by the Food and ***Agriculture*** Organisation (FAO, 1996). In India the contemporary debate regarding high levels of ***agricultural*** production and, in contrast, rampant malnutrition, provides the background for the food security of the country. Food availability and consumption of nutritious food are regarded as being at disastrously low levels in the country. According to the Economic ***Survey*** 2013–2014 released by Government of India, the per capita net availability of cereals and pulses at that time was estimated 468.9 gram/day and 41.91 gram/day respectively. The net availability of food grains has increased in 2013 at 229.1 millions tonnes showing a 15% increase over last year. The per capita availbility of food grains splirted to 186.4 kg/year from 164.3 kg in last year.

The net availability of edible oil also increased from 12.7 kg/year to 15.8 kg/year over the same period. The per capita availability of milk at 295 gram/day is higher than the world average while that of egg is around 55/year. The per capita availability of fruits rose from 114 gram/day in 2010–2011 to 172 gram/day in 2011–2012 while that of vegetable increased from 236 gram/day to 350 gram/day over the same period. Similarly, the consumption patterns of both both rice and pulses shows that rice consumption in rual has been decreased from 6.38 kg per person per month in 2004–2005 to 5.98 kg per person per month in 2011–2012, whereas pulse consumption were found incresed during the same period, i.e. 705 gram per month in 2004–2005 to 783 gram in 2011–2012 (Down to Earth). NSSO ***data*** 2004–2005 show that between 1993–1994 to 2004–2005 the average daily intake of calories of the rural population had dropped by 106 kcal (4.9%) from 2153 kcal to 2047 kcal and by 51 kcal (2.5%), from 2071 to 2020 kcal, in urban areas. The average daily per capita intake of protein of the Indian population decreased from 60.2 to 57 gm in rural India between 1993–1994 and 2004–2005 but remained stable at around 57 grams in the urban areas during the same period (NSSO, 2007). It further show that the calorie intake of the economically poor continues to be some 30% to 50% less than the calorie intake of the economically more affluent sector of the population, despite the poor generally needing more calories because they are mostly involved with physically more demanding manual work. Whereas the financially better-off in India consumed 2564 kcal per day in 2004–2005, the financially poor consumed only 1607 kcal per day, which can be interpreted as evidence of distress and hunger. It also highlights the fact that there is a higher reliance by the poor on cereal based calories because of lack of access to fruit, vegetables and animal-based products (NSSO, 2007) which has also continued to decrease from 12 kg per month in 1993 to 11.3 kg in 2005 (CLRA, 2009). Such fluctuating situation over food production, availability and consumption push the country to be always a hub for hungry people and thus is ranked 66th out of 88 countries in Global Hunger Index (Menon et al., 2008).

The latest ***data*** on households consumer expenditure in 2011–2012 conducted by the NSSO reveal that the average rural monthly per capital expenditure increased by 35.7% in the two year period between 2009–2010 and 2011–2012. Of the total expenditure, rural households spent less than half on food items. The average monthly per capita expenditure during 2011–2012 was some ‘1430 for rural India, a 35.7% increase compared to the 2009–2010 ***survey***, and 2630 for urban India, a 32% increase: the average urban monthly per capita expenditure was 84% higher than in rural areas. The proportion of expenditure on food declined substantially, from 53.6% to 48.6% in rural areas and from 40.7% to 38.5% in urban areas (*The Economic Times*, 21 June 2013).

Whilst it was claimed that gradual state intervention, following the deaths by starvation in the post-independence period, exemplified for example by the public distribution system (PDS), establishment of the Food Corporation of India (FCI) and fair price shops, to name but a few, helped reduce the levels of hunger among the poor, following free press and public action (Dreze and Sen, 1991), the continuing rampant poverty, food insecurity and inequality in their various forms cause India to be regarded as ‘home to a third of the world’s poor’ (Banik, 2011). Currently some 213.8 million people in India are reported as being under-nourished; that is, 17.0% of the total population (FAO, 2013). Various theories have been proposed to explain such a situation: the ‘entitlement failure’ model developed by Sen (1981) is widely accepted, in addition to the political economy approaches which emerged after the ‘export first policy’ in the 1990s resulting in a decline in per capita food consumption (Williamson 2001; Patnaik, 2003, 2004; Kumar, 2004).

The level of food security varies across regions, communities and households that depend on the availability and accessibility of food. When food security as a concept comes to the forefront of policy and academic debate, less attention is paid to the level of food security of tribal communities considered within a broader context. Detailed scrutiny of food security reveals that those people affected are largely the vulnerable groups: tribals, dalits (‘untouchables’), women and the old-aged. With regard to the tribal groups in particular, these are more vulnerable in many aspects of development, including access to food which are governed by both internal and external forces. However, poverty among the tribes is always accepted as a proxy for their vulnerability.

The state of Karnataka in Southwest India houses 52 tribal communities, including two particularly vulnerable tribal groups (PVTGs)1 – the Koraga and the Jenu Kuruba. According to the 2011 ***census*** the total tribal population of the state is 42.48 lakhs (1 lakh = 100,000), 6.95% of the total state population and 4.1% of the total tribal population of the country. These two tribal communities are considered to be more vulnerable and rampant malnutrition has been frequently reported, despite the booming state economy. Karnataka occupies a special position in the development map of the country, in particular with regard to ***agriculture***. It contributes some 7% of the ***agricultural*** production and 15% of the horticultural production in the country ([*www.bounteouskarnataka.com*](http://www.bounteouskarnataka.com)). In 2010–2011, Karnataka contributed 4.18% of rice, 17.61% of coarse cereals and 5.21% of cereal to the total production of these crops in India (Sivanandan, 2011). According to the IFPRI’s India State Hunger Index for 2008 (Menon et al., 2008), Karnataka is ranked 23.73; and the India Hunger Index ranks it as 11. Similarly, according to the Global Development Index, Karnataka is ranked at 66. The NSSO ***data*** 2004–2005 ( NSSO, 2007) show that 25.5% of the population of Karnataka consume less than 1890 kcal per capita per day and the state is considered to be ‘moderate food insecure’. However, the literature scarcely describes the fact of it being food insecure, particularly among the tribals, and this reflects the failure of policy and the political economy regarding service provisions that favours the poor and the failure to understand the informal food institutions used by local people. Given this background, this paper explores food vulnerability among two PVTGs in Karnataka and their strategies for coping with food insecurity.

**Study area and methodology**

This study was conducted during June 2012–December 2012among the Jenu Kuruba and Koraga tribes of Mysore and Dhakhina Kannada districts respectively in Karnataka state. The major objective of the study was to understand the level of food security among the tribes and to document coping strategies adopted to overcome food vulnerability at household level. ***Data*** were collected from 100 households in selected villages using personal interviews. ‘Household’ refers here to a family consisting of parents and children (married or unmarried) who share a common kitchen and in which the income of any member is used to support the family as a whole. In addition, other necessary contextual information was gathered using focus group discussions, case studies and the narrative method. Female heads of households were interviewed to a greater extent because of their role in the preparation of food. Given the objectives of the study, indicators for food security such as frequency of eating and the availability of three square meals per day2 were used to measure household food security. Households eating three square meals per day were considered ‘food secure’, whereas those households eating fewer than three were considered ‘food insecure’. Criteria such as purchasability, accessibility and consumption of nutritious food, that is cereals, pulses, vegetables, fruit, livestock products and other consumables, were also taken into account in defining a household as either ‘food secure’ or ’food insecure’. The availability of food at household level was mapped over a 12 month period, to determine whether there were food problems during particular seasons. Food consumption was measured according to the ‘past month’ – this refers to the month before the start of ***data*** collection for this study; that is, May 2012 in the case of the Jenu Kuruba where ***data*** were collected largely during June–July, 2012. In the case of the Koraga ‘past month’ refers to September 2012, with ***data*** largely collected during October–November 2012. The frequency of eating in a month was measured in term of numbers of times a particular food was consumed in the past month; that is, all times, 0–5 times (less than 5 times in a month), 6–10 times, and 11–15 times. In addition, the involvement of people with food institutions – the public distribution system (PDS), the integrated child development scheme (ICDS), the National Rural Employment Guarantee Scheme (NREGS) and self help groups (SHGs) – was considered in reaching an understanding of household food security: this anticipated possible access to food resources by way of institutional networks. Similarly, possible coping strategies were first developed and were pre-tested during the pilot ***survey***. The strategies were then categorized as: food based, income generation based, social based and non-farm; the impact of each strategy was measured according to the frequency with which a particular strategy was used.

**Background characteristics**

The socio-economic characteristics of the sample households (Table 1) show that the total population of the household was 396 – 179 males and 217 females – with a tribal distribution of 79 males and 106 females from the Jenu Kuruba and 100 males and 111 females from the Koraga. Regarding age, the largest group was that of the 15–45 year-olds, followed by 6–15 year-olds (79), 45–60 year-olds (45), 0–6 year-olds (42) and those above 60 years of age (27). 89% of the households live in a nuclear family. Regarding the level of education, 216 (54.5%), including children below school age, had not received formal education. The size of landholding was very small and only 36 households, mostly among the Jenu Kuruba, possessed ***agricultural*** land in their name. The average landholding was just under 1 acre (about 0.4 hectares) among the Jenu Kuruba and 0.76 acres (0.3 hectares) among the Koraga. The ***data*** for annual income received show that 156 members did not receive any income due to their being unemployed, that is children, the disabled and the old-aged: 123 did receive annual incomes of between **₹**2501–5000, followed by 63 who received income of between **₹**1000–2500 and 40 who received **₹**5001–7500. Eighty-six households all belonging to the Antodaya category, were found to possess ration cards .3

**Table 1.**

Socio-economic characteristics of sample households.

| **Characteristics** | **Level** | **Jenu Kuruba** | **Koraga** | **All** |
| --- | --- | --- | --- | --- |
| Population | Total | 185 | 211 | 396 |
| Male | 79 | 100 | 179 |  |
| Female | 106 | 111 | 217 |  |
| Religion (household) | Hindu | 50 | 50 |  |
| Age groups | 0–6 years | 20 | 22 | 42 |
| 6–15 | 47 | 32 | 79 |  |
| 15–45 | 88 | 115 | 203 |  |
| 45–60 | 20 | 25 | 45 |  |
| gthan 60 | 10 | 17 | 27 |  |
| Education | No education | 110 | 79 | 189 |
| Primary | 51 | 78 | 129 |  |
| Middle | 14 | 27 | 41 |  |
| High school | 0 | 10 | 10 |  |
| Below school age | 10 | 17 | 27 |  |
| Family types | Nuclear | 47 | 42 | 89 |
| Joint | 1 | 5 | 6 |  |
| Single | 2 | 3 | 5 |  |
| Land holding | Up to ½ Acre | 1 | 4 | 5 |
| ½ to 1 acre | 4 | 6 | 10 |  |
| 1–2 acres | 15 | 0 | 15 |  |
| 2–4 acres | 6 | 0 | 6 |  |
| Migration | Migrate | 29 | 26 | 55 |
| Annual Income | No income | 90 | 66 | 156 |
| Up to **₹**1000 | 8 | 4 | 12 |  |
| **₹**1001–2500 | 38 | 25 | 63 |  |
| **₹**2501–5000 | 45 | 78 | 123 |  |
| **₹**5001–7500 | 4 | 36 | 40 |  |
| **₹**7501–10000 | 0 | 1 | 1 |  |
| gthan**₹**10000 | 0 | 1 | 1 |  |
| Benefits | PDS | 46 | 40 | 86 |
| ICDS | 20 | 14 | 34 |  |
| Old aged pension | 8 | 12 | 20 |  |
| Widow’s pension | 1 | 9 | 10 |  |
| Free nutrition scheme | 50 | 50 | 100 |  |
| Livestock owned | Cow | 26 | 18 | 44 |
| Buffalo | 8 | 7 | 15 |  |
| Goat | 20 | 11 | 31 |  |
| Poultry | 19 | 17 | 36 |  |
| Assets possessed | Bank account | 20 | 28 | 48 |
| Post office account | 1 | 2 | 3 |  |
| Electricity | 8 | 12 | 20 |  |
| Television | 0 | 5 | 5 |  |
| Cable | 0 | 2 | 2 |  |
| Bicycle | 10 | 1 | 11 |  |

**Food consumption levels**

Food consumption at the appropriate level – in terms of both quantity and quality – determines a household’s food security. Generally the consumption of three ‘square meals’ in a day indicates that a household is food secure, as measured by NSSO. Given this, the food consumption levels of both the Jenu Kuruba and the Koraga showed that the majority (83.3%) ate two meals in a day and that only 1.8% had consumed three (see Table 2). ***Data*** on the availability of sufficient food show that the majority (17.9%) had experienced having meals without vegetables and that 15.2% of households could only afford to eat after obtaining food from the PDS : 9.6% of households stated that they had regularly eaten rice without added pulses or vegetables.

**Table 2.**

Frequency of eating, sufficiency of food and seasonality (the food calendar) of the sample households.

| **Particulars** | **Tribes** | **Total** |  |  |
| --- | --- | --- | --- | --- |
|  |  | **Jenu Kuruba** | **Koraga** |  |
| Food regularity |  |  |  |  |
| Ate three meals per day everyday | 1 (.5%) | 6 (2.8%) | 7 (1.8%) |  |
| On some days only ate two meals | 132 (71.4%) | 154 (73.0%) | 286 (72.2%) |  |
| Ate two meals most days | 176 (95.1%) | 154 (73.0%) | 330 (83.3%) |  |
| On some days ate fewer than two meal per day | 24 (13.0%) | 22 (10.4%) | 46 (11.6%) |  |
| Enough food at household level |  |  |  |  |
| Household ate meals without vegetables | 39 (21.1%) | 32 (15.2%) | 71 (17.9%) |  |
| Could afford to consume food obtained from the PDS | 26 (14.1%) | 34 (16.1%) | 60 (15.2%) |  |
| Could consume only one meal in a day | 34 (18.4%) | 13 (6.2%) | 47 (11.9%) |  |
| Cereals, pulses and vegetables were not available | 16 (8.6%) | 22 (10.4%) | 38 (9.6%) |  |
| Everybody received less than the necessary amount | 17 (9.2%) | 16 (7.6%) | 33 (8.3%) |  |
| Food calendar |  |  |  |  |
| No enough food | Monsoon | 48 (96%) | 48 (96%) | 96% |
| Whole year | 2 (4%) | 2 (4%) | 4% |  |
| Food was not available | Monsoon | 48 (96%) | 47 (94%) | 95% |
| Whole year | 2 (4%) | 3 (6%%) | 5% |  |
| Consumed food from kitchen garden | Winter | 10 (20%) | 24 (48%) | 34% |
| Monsoon | 11 (22%) | 3 (6%) | 14% |  |
| Could consumed food obtained from the PDS | Whole year | 46 (92%) | 40 (80%) | 86% |
| Consumed food from the ICDS | Whole year | 20 (40%) | 14 (28%) | 34% |
| Obtained work in MGNREGA | Summer | 22 (44%) | 40 (80%) | 62% |
| Could consume food from the Free Nutrition Scheme | Monsoon | 50 (100%) | 50 (100) | 100% |

The food calendars of both tribes reveal that the majority of the sampled households (96%) faced food problems, particularly during the monsoon, reported in terms of the availability of food and eating enough food. Honey collection, source of income for the Jenu Kuruba is restricted during the monsoon because of the incessant rain: it is difficult to collect the honey, and what honey is collected does not enjoy good prices in the market because of its watery nature. Similarly, the Koraga basket-makers also cannot dry their canes and thus cannot make and sell the usual numbers of their products. As a result, dependency on PDS rations and the Free Nutrition Scheme becomes the only option in obtaining and providing food for their families. Some of the households (*n* = 34) regarded rations from the ICDS as a major supplementary source of food because infants aged 0–6, pregnant woman and lactating woman are supplied ICDS provisions such as rice, lentils, blackgram, jaggery (unrefined cane sugar) and cooking oil free of charge. Availability of sufficient food during the monsoon was found to be very poor and as a result many households were prone to the distress of food insecurity at this time of year.

Table 3 shows the number of households that consumed particular food items during the month ***surveyed***. It can be seen that all categories of foods – cereals, vegetables, pulses, fruit, livestock products and others – were consumed, in varying quantities. Cereals such as rice, ragi, and wheat were eaten by both the Jenu Kuruba and the Koraga, with an estimated monthly mean consumption of 25.87 kg. Rice was the preferred cereal, consumed by all households with a monthly mean consumption of 22 kg, followed by wheat (2.362kg) and ragi (a form of millet) (0.680kg). Ragi was consumed more by Jenu Kuruba (88% households with a mean consumption of 0.980kg/month) as compared with 0.380kg/month by 20% of Koraga households. Few households stated that they consumed ragi from home production (*n* = 11) and this is attributed to the small size of landholdings; others said they obtained ragi from markets (*n* = 41). As Figure 1 shows, the frequency of consumption of cereals was such that, apart from rice, the other cereals were consumed by majority of households 0–5 times and 6–10 times in the month ***surveyed***.

**Table 3.**

Consumption of different food by sample households (in Kg/Month).

| **Items** | **Jenu Kuruba number of households** | **Tribes Mean quantity (monthly)** | **Koraga number of households** | **Mean quantity (monthly)** | **All number of households** | **Mean quantity (monthly)** |
| --- | --- | --- | --- | --- | --- | --- |
| Rice | 50 | 25 | 50 | 19 | 100 | 22 |
| Wheat | 25 | 2.25 | 33 | 2.475 | 58 | 2.362 |
| Atta | 3 | 0.09 | 11 | 0.26 | 14 | 0.175 |
| Corn | 28 | 0.72 | 25 | 0.6 | 53 | 0.660 |
| Ragi | 44 | 0.980 | 10 | 0.380 | 54 | 0.680 |
| **Totals (cereals)** | – | **29.04** | **–** | **22.715** | **–** | **25.877** |
| Chana | 22 | 0.47 | 29 | 0.24 | 51 | 0.355 |
| Lentil | 46 | 1.84 | 40 | 1.6 | 86 | 1.72 |
| Pigeonpea | 1 | 0.005 | 0 | 0 | 1 | 0.0025 |
| Blackgram | 21 | 0.230 | 13 | 0.160 | 34 | 0.195 |
| Greengram | 48 | 1.920 | 42 | 1.68 | 90 | 1.8 |
| Bengalgram | 15 | 0.140 | 9 | 0.060 | 24 | 0.10 |
| Cowpea | 3 | 0.03 | 0 | 0 | 3 | 0.015 |
| Toordal | 43 | 1.72 | 46 | 1.84 | 89 | 1.78 |
| Totals (pulses) |  | **6.355** |  | **5.58** |  | **5.967** |
| Onion | 50 | 1.46 | 50 | 1.38 | 100 | 1.42 |
| Garlic | 40 | 0.26 | 36 | 0.22 | 42 | 0.24 |
| Chili | 50 | 0.58 | 50 | 0.64 | 100 | 0.61 |
| Tomato | 30 | 0.72 | 44 | 0.94 | 74 | 0.83 |
| Guard | 14 | 0.22 | 14 | 0.32 | 28 | 0.27 |
| Drumstick | 4 | 0.03 | 9 | 0.04 | 13 | 0.035 |
| Ladyfinger | 16 | 0.11 | 13 | 0.1 | 29 | 0.105 |
| Brinjal | 26 | 0.38 | 31 | 0.48 | 57 | 0.43 |
| Beans | 13 | 0.150 | 10 | 0.130 | 23 | 0.140 |
| Potato | 33 | 0.79 | 26 | 0.43 | 59 | 0.61 |
| Mushroom | 40 | 0.64 | 20 | 0.58 | 60 | 0.61 |
| **Totals (vegetables)** |  | **5.34** |  | **5.26** |  | **5.3** |
| Banana | 15 | 0.24 | 21 | 0.34 | 36 | 0.29 |
| Coconut | 8 | 0.22 | 13 | 0.28 | 21 | 0.25 |
| **Totals (fruit)** |  | **0.46** |  | **0.62** |  | **0.54** |
| Milk (litres) | 21 | 0.19 | 13 | 0.12 | 34 | 0.155 |
| Egg (numbers | 49 | 25.48 | 50 | 26 | 99 | 25.74 |
| Mutton | 6 | 0.080 | 8 | 0.120 | 14 | 0.100 |
| Chicken | 13 | 0.4 | 20 | 0.62 | 33 | 0.51 |
| Fish | 25 | 0.375 | 26 | 0.425 | 51 | 0.4 |
| **Totals (livestock products)** |  | **0.885a** |  | **1.165a** |  | **1.01a** |
| Biscuit (pocket) | 14 | 0.7 | 13 | 0.58 | 27 | 0.64 |
| Tea | 50 | 0.14 | 50 | 0.17 | 100 | 0.155 |
| Sugar | 50 | 1.06 | 50 | 1.02 | 100 | 1.04 |
| Jaggery | 32 | 0.53 | 42 | 0.675 | 74 | 0.6025 |
| Salt | 50 | 1 | 50 | 1 | 100 | 1 |
| Coffee | 7 | 0.03 | 4 | 0.022 | 100 | 0.026 |
| Pickle | 31 | 0.22 | 46 | 0.42 | 77 | 0.32 |
| Cooking Oil | 50 | 1.26 | 50 | 1.18 | 100 | 1.22 |
| Spice | 50 | 0.38 | 50 | 0.44 | 100 | 0.41 |
| **Totals (other items)** |  | **5.32** |  | **5.507** |  | **5.413** |

**a**

This average does not include milk and eggs, these are measured in litres and numbers respectively.

**Figure 1.**

Frequency of consumption of cereals.

The ***data*** on consumption of pulses show that greengram had been consumed by more households (90) followed by lentils (87), toordal (77), chana (51), blackgram (20), Bengal gram (5), cowpea (3) and pigeonpea (1). The consumption of each pulse listed varied between the two communities. For example, of the 51 households that consumed chana, 22 (43.1%) were Jenu Kuruba and 29 (56.9%) were Koraga. The highest number of Jenu Kuruba households – 46 (53.5%) – consumed lentils compared to 40 (46.5%) Koraga households. Greengram was consumed by 48 (53.3%) Jenu Kuruba households and 42 (46.7%) Koraga household. Consumption of pigeonpea was reported by only one household. Figure 2, the frequency of consumption of pulses, shows that chana, lentils and greengram were widely consumed among both tribes for 6–10 times and 11–15 times in the month ***surveyed***. Consumption of lentils, greengram and toordal was frequent 0–5 times in the month, followed by 6–10 times and 11–15 times per month. Larger consumption of pulses was found among the Jenu Kuruba, with monthly mean consumption of 6.355kgs as compared to 5.58kgs among the Koraga. The frequent consumption of these pulses is attributed to the operation of the Free Nutrition Scheme by the government, in which both tribes are entitled to receive free rations for six months in a year. Some of the families also obtained pulses from the Anganwadi centre and this explains the reported increased consumption of pulses .

**Figure 2.**

Frequency of consumption of pulses.

Consumption of vegetables, one of the important determinants in the food security analysis, especially with regard to nutritional levels, was very low for both tribes – estimated to be only 0.46kg/month and 0.62kg/month for the Jenu Kuruba and Koraga respectively. They only consume seasonally available vegetables but in many instances vegetables collected from local forests are used. Vegetables such as drumsticks, ladyfinger (okra) and beans are consumed hardly at all. Figure 3 shows that gourds, drumsticks, ladyfingers and beans were consumed fewer than five times (that is, 0–5 times) in a month, as reported respectively by 28, 13, 29 and 23 households. Frequency of consumption of vegetables such as garlic, tomatoes, brinjal, potatoes and mushrooms was greater, at 6–10 times in the month. Consumption of mushrooms, because they were freely available in local forests, was quite high during the monsoon among both the tribes. Similarly, fruit is consumed very little, with an average monthly quantity consumption of 0.54kg. Only banana and coconut were reported as having been consumed: 36 households ate bananas in the month ***surveyed*** (estimated mean consumption of 0.29 kg) and 21 households ate coconut (0.25kg). Those who consumed these fruits were found had only done so for 0–5 times in the month, and said that they had obtained them from markets (see Figure 4).

**Figure 3.**

Frequencyy of consumption of vegetables.

**Figure 4.**

Frequency of consumption of fruit.

Livestock products are crucial nutritional content of the tribal diets and are thus considered important component in the definition of food security. Milk, mutton, chicken and fish are important foods among both the tribes, although consumption levels were very low. For example, 21 Jenu Kuruba and 13 Koraga households consumed milk during the month ***surveyed***, with estimated mean consumptions of 0.19 litres and 0.12 litres respectively. Fish was regularly eaten by 51% of the households, but mostly those of the Koraga due to their coastal location. The frequency of consumption of livestock produce differed between the tribes (see Figure 5). The largest number of households ate eggs 5–10 times in the month ***surveyed***, followed by 0–5 times and 11–15, times with average quantity consumed being 25.74 eggs. Mutton was consumed very little, reported by only 14 households with a monthly consumption of 0.100kg. Those who had eaten mutton said they purchased it from the market. However, although some of the households did have domesticated goats and sheep, they did not eat these animals, for two reasons. One, killing a large goat or sheep represents monetary loss because some sell the goats in the markets for cash income; and, second, some of them regard pet goats in their homes as their offspring and killing them would be considered sinful. All those who consumed mutton in the month ***surveyed*** said they had bought it because of guests; they otherwise prefer to eat poultry and fish.

**Figure 5.**

Frequency of consumption of livestock products.

Other consumables such as sugar, jaggery and cooking oil were consumed by both tribes to significant extents: utems such as biscuit and coffee are consumed very little. Items such as jaggery and cooking oil are supplied free of charge by the government for six month during the monsoon and thus consumption of such items obtained from the markets was very small. Those having ration cards receive sugar from the PDS at subsidised prices. Figure 6, the frequency of consumption of other foods, shows that of the total number of households consuming jaggery (*n* = 74), 27 (84.4%) of Jenu Kuruba households had eaten it for 0–5 times, followed by 6–10 times by 5 (15.6%) households: this compares with 59.5% households consuming it for 0–5 times followed by 26.2% and 14.3% households for 6–10 times and 10–14 times respectively among the Koraga. Only 11 households (78.6%) had consumed biscuit for 0–5 times, while 3 households (21.4%) consumed it for 6–10 times, 9 (69.2%), 3 (23.1%) and 1 (7.7%) households consumed it for 0–5 times, 6–10 times and 10–14 times respectively. Similarly, although spice was consumed regularly, the quantity purchased is very small – typically only 0.410kg per month and it was often replaced by the aromatic plant species popularly known among both the tribes as *Moradapachi*.

**Figure 6.**

Frequency of consumption of other foods.

**Sources of food consumption**

The Jenu Kuruba and Koraga tribes received food items from different sources, the principal of which were home production (kitchen garden or own farm), the PDS, the ICDS, local forests, and the Free Nutrition Scheme (see Table 4).4 Food consumption from home production was found to be very low due to the small extent of land holdings: only 36 households possessed land. Those who did possess land said they did not cultivate it; rather, they mortgaged it several times to non-tribals. Those who did cultivate the land grew crops such as paddy (rice), ragi and tobacco.

**Table 4.**

Consumption of food from different sources by the households sampled.

| **Items** | **Tribes** | **Total** |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Jenu Kuruba** | **Koraga** |  |  |  |  |
| Home Production |  |  |  |  |  |  |
|  | Number of households | Mean quantity (kg/month) | Number of households | Mean quantity (kg/month) | Number of households | Mean quantity (kg/month) |
| Corn | 28 | 1.28 | 25 | 1.2 | 53 | 1. 24 |
| Ragi | 11 | 2.53 | 2 | 2.64 | 13 | 2.59 |
| Milk (litres) | 21 | 0.48 | 13 | 1.3 | 34 | 0.764 |
| Chicken | 5 | 0.180 | 9 | 0.280 | 14 | 0.240 |
| Coconut | 0 | 0 | 1 | NA | 1 | NA |
| Pickle | 0 | 0 | 25 | 0.19 | 25 | .019 |
| PDS |  |  |  |  |  |  |
| Rice | 26 | 16 | 27 | 19 | 53 | 17 |
| Wheat | 25 | 3.2 | 25 | 1.4 | 50 | 2.3 |
| Sugar | 46 | 0.8 | 40 | 0.8 | 86 | 0.8 |
| Free nutrition scheme |  |  |  |  |  |  |
| Rice | 48 | 9.2 | 50 | 10.2 | 98 | 9.7 |
| Lentil | 46 | 1.84 | 40 | 1.6 | 86 | 1.72 |
| Green gram | 48 | 1.92 | 42 | 1.68 | 90 | 1.8 |
| Toordal | 43 | 1.72 | 46 | 1.84 | 89 | 1.78 |
| Blackgram | 18 | 0.75 | 15 | 0.5 | 33 | 0.625 |
| Egg (numbers) | 49 | 25.48 | 50 | 26 | 99 | 25.74 |
| Jaggery | 32 | 0.530 | 42 | 0.675 | 74 | 0.602 |
| Cooking oil | 50 | 1.26 | 50 | 1.18 | 100 | 1.22 |

The Jenu Kuruba households residing in the Nagarhole wildlife sanctuary did not own any ***agricultural*** land other than small patches for kitchen gardens. They live largely on forest resources or minor forest produce, in addition to using pro-poor services intended for them. Those who grew different crops immediately sold these crops in local markets or, often, used them to repay earlier loans. Only 14 households (12 Jenu Kuruba and 2 Koraga) reported having consumed ragi from their own production, with a mean consumption of 2.59kg per month.

**The PDS and Free nutrition Scheme**

The PDS and the Free Nutrition Scheme are two other important sources of food for both the tribes. The usual food and related items supplied through the PDS are rice, wheat, sugar and kerosene. Of the households possessing ration cards (*n* = 86; 46 Jenu Kuruba and 40 among Koraga), 53 households reported having obtained rice and 50 wheat from the PDS, with monthly consumptions of 17 kg and 2.3 kg respectively. Under the PDS provision each beneficiary is entitled to receive 29 kg of rice, 6 kg of wheat and 1 kg of sugar at **₹**3.25/kg, **₹**2.50/kg and **₹**16.50/kg respectively5. The Gram Panchayat, the local government body at village level) was directly involved in distributing the rations except for the village located inside the wildlife sanctuary, to which a delivery van came every month.

The Free Nutrition Scheme is intended exclusively for the Jenu Kuruba and Koraga tribes in the state: it was initiated to support their livelihoods during the monsoon season.The Free Nutrition Scheme has become invaluable: each beneficiary household is given 15 kg of rice, 2 kg of lentils, 2 kg of hesur dal (green gram), 2 kg of jaggery, 1 litre of palm or coconut oil and 30 eggs under the scheme. Analysis of food consumption supplied through this scheme showed that almost all beneficiaries consumed the food items at different levels. It was found that more than 70% of households reported having received food items under this scheme during the month ***surveyed*** for this present study, apart from 33% of households who that had consumed urad-dal (blackgram).

**The ICDS**

The Anganwadi (ICDS centre) plays a dominant role in providing supplementary food to households meeting its criteria, that is those with children between 0–6 years of age, pregnant women, lactating mothers and the old-aged, in addition to health education, immunisation and pre-school training for 3–6 year-old children. Of the total receiving support from the ICDS (*n* = 34) in the sampled households, there were 22 children below 6 years old, eight pregnant women, two lactating mothers and two old-aged. The majority of them (*n* = 21) said they received nutritional support from the centre. Each beneficiary child is entitled to 75g of rice, 5 g of dal, 3 g of sambar, 20 g of groundnuts and 5 g of jaggery per month, cooked and served at the centre. Foods such as chitrana rice (lemon rice), groundnuts, peas, jaggery, keshribhat and sira (a kind of sweet) are served at breakfast time for three consecutive days. Rice and sambar (lentil-based stew) are served at lunch times. Vegetables are rarely used in sambar, according to the Anganwadi workers.

Similarly, pregnant and lactating women are entitled to 2 kg rice, 7 kg wheat, 2 kg of dal, 1 kg of rawa and 0.5 kg of lentils in a month. Children between 0–3 years are also entitled to 2 kg of wheat, 2 kg of rice, 750 g of dal (preferably toor or blackgram) and .5 kg of jaggery each month. Food items can be delivered to a beneficiary’s door, but the Anganwadi workers prefer beneficiaries to collect their entitlement in person at the Centre.

**The forest as a source of food**

Unlike other tribal communities, the Jenu Kuruba and Koraga traditionally depend on local forests for their day-to-day activities. They collect different forest produce such as leaves, tubers, rhizomes, resin, honey, etc., for consumption. As already noted, honey collection is a major source of income for the Jenu Kuruba: they sell it either in the markets or to the state cooperative society, LAMPS, operated by the Integrated Tribal Development Agency (ITDA). In general the honey is sold at **₹**120-140 per kg: some reported selling the honey in the local markets for around **₹**200–250 per kg. The income then increases their purchasing capacity outside the market.

The green leaves collected most included Akkiganesha, Nure, Lillikeye Mulluganesha, Nareganesha, Korne and Andhiganeshaoften used in place of vegetables purchased from markets. Rhizomes such as keu are collected from the local forest and processed to remove its bitterness before being eaten. Morada-pachi, used as spice by both the tribes, is also collected throughout the year. It is sold in the markets or to LAMPS for about **₹**140–200 per kg.

The Koraga –basket-makers collect bamboo from the local forests to make canes (buti) that are either sold in the weekly market at Mudipu or Bantwal or village to village, for about **₹**20–80 per cane (depending on size).

**Consumption of food from markets**

Consumption of food obtained from markets was very small for both tribes (see Table 5) and this is attributed to the fact that they receive sufficient rations from the PDS and the Free Nutrition Scheme. Some households, particularly those with children aged between 0–3 years, pregnant women and lactating mothers, receive food free of charge from the Anganwadi centre and this also supplements their household food security without significant dependency on the markets. It was noted that some of the households were selling the rice obtained from the PDS and the Free Nutrition Scheme or, often, exchanging it for the other necessary goods such spice, salt, tea, and so on. The informal interviews with the local, non-tribal shopkeepers in the village studied, revealed that the villagers mostly purchased tea, spice, salt and sugar in small quantity, sufficient for just a day or two. It was found that all those households not having a PDS card (*n* = 14 frequently depended on the markets for food. It was said that after the Free Nutrition Scheme was introduced, the dependency of both the tribes on the markets reduced because the rations received from the Scheme and others were more than sufficient for their families.

**Table 5.**

Quantity of food consumed from markets.

| **Items** | **Tribes** |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Jenu Kuruba** | **Koraga** | **All** |  |  |  |
|  | **No.of HH** | **Mean quantity (kg per month)** | **No. of HH** | **Mean quantity (kg per month)** | **No. of HH** | **Mean quantity (kg per month)** |
| Rice | 4 | 18 | 9 | 15.22 | 13 | 16.07 |
| Ata | 3 | 1.5 | 11 | 1.9 | 14 | 1.25 |
| Ragi | 33 | 1.13 | 8 | 1.875 | 41 | 1.28 |
| Chana | 21 | 0.523 | 28 | 0.357 | 49 | 0.428 |
| Peageonpea | 1 | 0.25 | 0 |  | 1 | 0.25 |
| Blackgram | 21 | 0.547 | 13 | 0.615 | 34 | 0.573 |
| Bengalgram | 15 | 0.766 | 9 | 0.333 | 24 | 0.416 |
| Toordal | 0 | – | 10 | 0.7 | 10 | 0.7 |
| Onion | 50 | 1.46 | 50 | 1.38 | 100 | 1.42 |
| Garlic | 40 | 0.325 | 36 | 0.305 | 76 | 0.315 |
| Chili | 50 | 0.58 | 50 | 0.64 | 100 | 0.61 |
| Tomato | 31 | 1.161 | 43 | 1.09 | 74 | 1.121 |
| Guards | 14 | 0.571 | 14 | 0.714 | 28 | 0.642 |
| Drumstick | 4 | 0.375 | 9 | 0.222 | 13 | 0.269 |
| Ladyfinger | 16 | 0.343 | 13 | 0.384 | 29 | 0.396 |
| Brinjal | 26 | 0.73 | 31 | 0.774 | 57 | 0.771 |
| Beans | 13 | 0.576 | 10 | 0.65 | 23 | 1.07 |
| Potato | 33 | 1.19 | 26 | 0.826 | 59 | 1.03 |
| Banana | 15 | 0.8 | 21 | 0.809 | 36 | 0.805 |
| Coconut | 8 | 1.375 | 12 | 1 | 20 | 1.15 |
| Chicken | 8 | 1.687 | 12 | 1.625 | 20 | 1.65 |
| Mutton | 6 | 0.666 | 8 | 0.75 | 14 | 0.714 |
| Fish | 25 | 0.75 | 26 | 0.817 | 51 | 0.784 |
| Biscuit | 14 | 2.5 | 13 | 2.23 | 27 | 2.37 |
| Tea | 50 | 0.14 | 50 | 0.17 | 100 | 0.155 |
| Sugar | 5 | 1.5 | 13 | 1.07 | 20 | 1.07 |
| Salt | 50 | 1 | 50 | 1 | 100 | 1 |
| Coffee | 7 | 0.214 | 4 | 0.275 | 11 | 0.236 |
| Pickle | 31 | 0.354 | 41 | 0.378 | 72 | 0.368 |
| Oil | 19 | 1.39 | 14 | 1.39 | 33 | 1.39 |
| Spice | 50 | 0.38 | 50 | 0.44 | 100 | 0.41 |

Nevertheless, both tribes were found to be purchasing food items, in different quantities, from markets,. For example, 41 households bought ragi (cereal) (33 Jenu Kuruba and 8 Koraga), eaten in the form of ragi-muuda. Atta (whole wheat flour) was purchased by 3 Jenu Kuruba and 11 Koraga families, with mean consumption of 1.25kg per month. Market purchases of pulses were also low among both the tribes, with a mean consumption of 2.367kg per month: this was because the lentil and greengram obtained from both the Free Nutrition Scheme and the ICDS were more sufficient for a month. Chana was consumed more – in 49 households – followed by blackgram (*n* = 34), Bengalgram (21), toordal (10) and pigeonpea (1), in quantities per month of 250g of blackgram, 365gof Bengalgram and 500gof toordal. In addition, vegetables from markets were often replaced by wild green leaves and edible rhizomes collected from local forests. Vegetables such as onions, chilies and tomatoes were mostly purchased from markets, however; and those such as gourds (0.642 kg per month), drumsticks (0.269 kg), ladyfingers (0.396 kg) and beans (1.07 kg) were consumed very much less, as reported by 28, 13, 29 and 23 households respectively.

Consumption of livestock products from the markets – that is, milk, mutton, chicken and fish – was very low. The Koraga, located on the coast, are fish eaters: because of lack of money they do not buy fish in large quantities, rather they buy small amounts for which they spent around **₹**10–15 in a week. The Jenu Kuruba consume very little fish and even if they purchase, they spend only about **₹**10 in a week. Only 20 households (8 Jenu Kuruba and 12 Koraga) were found to have consumed chicken obtained from markets, with a monthly mean consumption of 1.65kg: on many occasions they satisfy themselves by consuming eggs obtained under the Free Nutrition Scheme.

The households frequently purchases other foodstuffs, such as salt, tea, coffee, pickles and spice. Some of the larger-size households purchased cooking oil, because the quantity supplied under the Free Nutrition scheme is less for families. The quantity of spice used among both tribe very moderate, some 200 g per month, reported as being purchased to last for just a day or two. Spice was often obtained in exchange for rice itself obtained, due to lack of money, from the PDS or the Free Nutrition Scheme. Sugar received from the PDS was not sufficient for large families and thus it was purchased from markets at **₹**38 per kg (as reported by 20 households, with an estimated consumption of 1.07 kg per month).

**Food expenditure**

Expenditures on food in both the communities were found to be extremely low as Table 6 shows, the main expenditures were on rice, onions, garlic, tea, pickles and spice. In addition, the major portion of their income is spent on food items only (Table 7). Figure 7 shows the monthly per capita food expenditures and the monthly average household food expenditures of the households sampled and this indicates that the level for the Jenu Kuruba is below that if the Koraga tribe – largely attributed to the fact that the Jenu Kuruba are located inland and lack access to mainstream benefits. The per capita expenditure per month on cereals was estimated to be **₹**13.94 among the Jenu Kuruba and **₹**16.84 among the Koraga; whereas among Jenu Kuruba per month it was **₹**5.10 for pulses, ‘23.42 for vegetables, **₹**10.37 for livestock products, **₹**2.30 for fruit and **₹**33.30for other foods compared with **₹**5.50, **₹**22.46, **₹**11.68, **₹**2.62 and **₹**30.16 among Koraga per month for the same food categories respectively. Similarly, the average monthly food expenditures among Jenu Kuruba households were estimated to be **₹**51.60 on cereal, **₹**18.80 on pulses, **₹**36.66 on vegetables, **₹**38.40 on livestock products, **₹**8.90 on fruit and **₹**123.22 on other food, compared with **₹**71.10, **₹**23.20, **₹**94.80, **₹**49.30, **₹**11.10 and **₹**127.28 respectrively among the Koraga. The explanation for this low expenditure on food among both tribes is the food received from the Free Nutrition Scheme and the PDS, which had become sufficient. Those who purchase these items only do so in small quantities, as shown in Table 5.

**Table 6.**

Average monthly household expenditure on different food items (in **₹**).

| **Food category** | **Items** | **Jenu Kurba (₹ per month)** | **Koraga (₹ per month)** |
| --- | --- | --- | --- |
| Cereals | Rice (market) | 15.4 | 42.3 |
| Rice (PDS) | 0 | 1.8 |  |
| Wheat | 18 | 18 |  |
| Atta (market) | 0.9 | 4.1 |  |
| Ragi | 17.3 | 4.9 |  |
| Pulses | Chana | 8.3 | 14.3 |
| Black gram | 10.5 | 4.7 |  |
| Bengalgram | 6.3 | 3.7 |  |
| Toordal | – | 4 |  |
| Vegetables | Onions | 25.64 | 29.9 |
| Garlic | 17.3 | 18.9 |  |
| Chilies | 18.5 | 21.2 |  |
| Tomatoes | 11.5 | 17.54 |  |
| Gourds | 6.06 | 5.66 |  |
| Drumsticks | 1.4 | 3 |  |
| Ladyfinger | 4.34 | 3.8 |  |
| Brinjal | 9.3 | 10.7 |  |
| Beans | 4.46 | 3.6 |  |
| Potatoes | 13.8 | 10.4 |  |
| Fruits | Bananas | 7.4 | 3.7 |
| Coconut | 5.6 | 2.9 |  |
| Livestock | Fish | 11.8 | 15.2 |
| Mutton | 13.3 | 17.2 |  |
| Chicken | 13.3 | 16.9 |  |
| Others foods | Biscuit | 3.8 | 3.9 |
| Tea | 21.9 | 21.3 |  |
| Sugar | 2.2 | 8.9 |  |
| Sugar (PDS) | 14.72 | 12.48 |  |
| Salt | 22.1 | 20.4 |  |
| Coffee | 3.6 | 1.4 |  |
| Pickles | 18.1 | 23.6 |  |
| Oil | 10.5 | 9.2 |  |
| Spice | 26.3 | 27.5 |  |

**Table 7.**

Spending habits of the households sampled.

| **Spending habits** | **Fooda** | **Clothinga** | **Educationa** | **Medicinea** | **Jewelrya** | **Religious functionsa** |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Jenu Kuruba** | **Koraga** | **Jenu Kuruba** | **Koraga** | **Jenu Kuruba** | **Koraga** | **Jenu Kuruba** | **Koraga** | **Jenu Kuruba** | **Koraga** | **Jenu Kuruba** | **Koraga** |
| Fully | 7 | 5 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Substantially | 43 | 43 | 16 | 21 | 0 | 1 | 5 | 5 | 1 | 3 | 0 | 1 |
| Partly | 0 | 2 | 32 | 25 | 7 | 4 | 0 | 6 | 0 | 2 | 2 | 3 |
| None | 0 | 0 | 2 | 2 | 43 | 45 | 45 | 39 | 49 | 45 | 48 | 46 |
| Total | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |

**a**

Numbers indicate number of households.

**Figure 7.**

Monthly per capita food expenditures and average monthly household food expenditures (in ₹).

**Coping strategies**

The Jenu Kuruba and Koraga tribes adopt various strategies to cope with and avoid various consequences of food insecurity. The extent to which these strategies are implemented depends on the severity of the food shortage at household level: strategies used are localised and short-term. The mechanisms that were found were food-based, non food-based, off-farm and social-based. Food-based coping strategies were the predominant form adopted.

Figure 8 shows the number of households that relied on particular coping strategies during the month ***surveyed***. The strategies were adopted at different frequencies: at all times; quite often; not very often ; and hardly at all – and this indicates the severity of food insecurity (see Figure 9). The following sections present in brief the coping strategies and related processes adopted by both tribes.

**Figure 8.**

Coping strategies adopted.

**Figure 9.**

Severity of food insecurity addressed by coping strategies.

**Food based coping**

Food-based coping mechanisms included reductions in food intake and meal size, consumption of less-preferred food, intra-household food distribution and reliance upon forest food. Collection of forest resources, particularly during the monsoon season, continues to be a major source of food for both the tribes, as reported by 45 (56.3%) Jenu Kuruba and 35 (43.8%) Koraga households and on total dependence on the forest. Seventy-three households relied on intra-household food distribution, 70 on waiting until food prices dropped to affordable levels, 62 reduced the number of meals per day, and 59 ate less-preferred food.

Borrowing money, both from friends and relatives and from local shops or money lenders, often served as an alternative form of coping mechanism. Some 44 households (12, or 27.2%, from the Jenu Kuruba and 32, or 72.7%, from the Koraga) relied on friends and family, and 25 Jenu Kuruba and 14 Koraga households depended on local shops and money, for borrowing money to purchase food in the month ***surveyed***; .

Intra-household food distribution by tradition is a predominant coping strategy. Whenever there is not enough of a food ingredient, or it is unavailable in a household, neighbouring families are asked if they can help. Cooked food, for instance, is often exchanged between families. Sometimes the households concerned replace and return the borrowed food items : this was reported by 73 households. Households borrowing food return the items with a similar or higher value. Such relationships can be visualised in terms of the Levi-Strauss’s notion of ‘gift and reciprocity’ (Levi-Strauss, 1949).

Reduction of meal size, food intake and eating less-preferred food were frequently seen to be adopted during food shortages. Very often pulses and vegetables were not included in regular food supplied and households managed instead with wild green leaves, rhizomes and mushrooms collected from the local forests, particularly during monsoon. The reason for adopting such strategies was said to be increasing food prices which they could not afford. Sometimes elders, largely the mother, would reduce her food intake so that her children would have enough to eat. Equally, 30 Jenu Kuruba and 29 Koraga families chose lower-priced foods, to avoid price volatilities. Some of the households did not even purchase vegetables particularly then prices were high, and waited until the price dropped to affordable levels: this was reported by 36 Jenu Kuruba and 34 Koraga households. People often skipped meals as a form of coping, largely during the rainy season, as reported by 10 Jenu Kuruba but only 4 Koraga households. However, consumption of only two square meals in a day by both the tribes itself indicates food insecurity, as shown in Table 2.

**Income generation-based coping strategies**

The income generation-based coping strategies adopted most were found in the context of migration, working as ***agricultural***-wage labourers, non-***agricultural*** labourers and in traditional occupations or non-farm related areas such as construction, artisan, collection of forest produce, etc. The traditional occupations – honey collection for the Jenu Kuruba and basketry for the Koraga – are the principal income generation activities, as already noted.

Migration, particularly during lean periods and the monsoon season – is another form of coping strategy adopted by both tribes, as reported by 55% of households. Because pursuing their traditional occupations is affected badly during the monsoon season, simply surviving on limited incomes becomes difficult and migration is chosen as a means of escaping from food vulnerability. Large scale migration is attributed to the lack of employment in the tribal regions. Individuals migrate mostly to the Kodagu district, where they are employed as ***agricultural*** labourers or plantation workers. As reported by 55 individuals, a migrant can earn **₹**250 per day and thus contribute to their food household food security. Migration therefore plays a significant role in increasing their ability to purchase food. A total of 32 migrants (58.9%) sent money to their families at regular monthly intervals; a further, different 23 (41.1%) gave the money to their family only during times of need, otherwise keeping it with them until they finally returned home. It was also reported that some of the households chose to do quarry-related work such as road construction, building, stone works, etc., not only to earn income but also to reduce the household food burden, because in many instances the contractor or landlord concerned would provide full meals during periods of work.

**Social-based coping strategies**

The social-based strategies essentially involve alteration of social relationships in order to avoid unnecessary expenditures. This increases the amount of income available for food security. The social-based strategies used include changes in familial relationships (maintaining a distance in an existing relationship), avoidance of spending on social functions, postponement of social functions, sending children to other households, and curtailment of giving gifts. However, the patron–client relationship has existed since the start of human settlement, and its present form is evident merely in term of land and productive behaviour. The tribals, being poor, always rely on non-tribals for various forms of help; but post-allocation of land witnessed a different form of relationship among non-tribals and local tribals.6 Competitive market forces among non-tribals in this region forced many of them to capture the labour force, tenancy market and tribal lands. However, direct dependency of the tribals on non-tribals very often paves the way to seizure of tribal land by the non-tribals. All of these factors are attributed to the lack of capability among the tribals. Given poverty as a proxy for dependency, such relationships have continued to become both a buffer and a strategy for both the tribes as well in mitigating their household food vulnerability.

The extent of kin relations among the Jenu Kuriba and the Koraga differs widely because of their locations. The kin relations of the Jenu Kuruba was found to be stronger than those of the Koraga. Caste neighbour also plays an important role in reciprocating food consumption behaviour, as found in patron–client relations in ***agricultural*** production. Mutual exchange of labour between the families, particularly among the land-owning category, was also found to be an important strategy, making them more economical. Further, a formal discussion with people from both tribes revealed that very often they reduce their social expenditure by not attending different social functions – such as weddings – simply to reduce their household costs. Previously they would have attended social functions and given gifts such as goats and sheep, depending on the distance of relationships, in the expectation of reciprocal action from the recipient households. Currently, however, they only attend marriage and death ceremonies of close relatives. When invited to attend social functions by more distant relatives or friend they either simply attend the function without offering a gift or, sometimes, give a token amount money (typically **₹**10–20).

**Non-food related coping strategies**

It was observed that the Jenu Kuruba and Koraga tribes adopting some non-food related strategies, in order to enhance their ability to purchase food: for instance, changes in purchasing behaviour, sending children to school and the Anganwadi, increasing cash income by working overtime, postponing medical treatment, avoiding travel, and so on. Changes in purchasing behaviour was found to be a predominant form of coping strategy: it can be regarded as an ‘income enhancer’ strategy, in that it involves controlling the purchase of unnecessary goods and thus increasing the amount of money available for purchasing food. A large portion of their income was spent mostly on food items, followed by some spending on clothes and other necessary items (see Table 7). Spending on religious and communal activities was at a very low level among both the communities. Purchase of clothes for the elderly was rare: clothes were mostly bought for the children only. In many instances younger children in the family were asked to wear used clothing handed down by older brothers and sisters, simply to avoid spending on new items. Whenever purchases were necessary there was a preference for buying less expensive clothes for all the children once a year – often on credit, repaying the loan in cash rather than ‘in kind’. Sending children to schools and the Anganwadi centre, wherever possible, was observed as another important coping strategy. However, the lack of interest among the children themselves often prevented such a strategy from being implemented successfully. Similarly, both the Jenu Kuruba and Koraga tribes rely solely on traditional healers and traditional medicines not because they have no access to modern health services but rather because of attachment to belief in their traditional health. However, at certain levels some of the households studied chose to postpone medical treatment, or to wait until the necessary money for treatment had been saved and keeping food expenditures separate.

The frequency with which different coping strategies were adopted by both the Jenu Kuruba and Koraga tribes suggests that the selection of particular coping methods to mitigate household food insecurity depends on the particular geographical setting and the availability of resources. The extent to which a particular method was adopted depended on the flow of income and assets into the households (Figure 10). Those households falling between income groups **₹**2501–5000 and **₹**5001–7000 were found to have adopted as many coping strategies as possible. However, it was also clear that there was no significant relationship between the nature of the income and the nature of the coping strategies. Dependence upon friends, money lenders and use of credit as coping mechanisms obscures portrayal of the extent of dependency by way of the annual income, because the number of households in the **₹**1001–2500 and **₹**2501–5000 income group was found to be alarmingly high. It may be the fact that the loans can be repaid as part of coping is somewhat difficult for other income group households to accept. Nevertheless, the coping methods adopted to date are individual choices and are not enforced by any external agencies.

**Figure 10.**

Relationship between income and coping strategies.

**Discussion and conclusions**

Analysis of the consumption of different foods by the Jenu Kuruba and Koraga tribes shows that quantities consumed were alarmingly low. The food security level of both the tribes, measured in terms of *availability of food* and *sufficiency of food*, together with rates of food consumption and expenditure levels, was also found to alarmingly low, failing to achieve the level set by the Indian state. The consumption level of the Koraga is somewhat better than that of the Jenu Kuruba, largely attributed to the former’s inland location and the absence of, or limited, sources of income or the lack of purchasing capability in the latter group. The food consumption patterns show contains a predominance of a limited number of cereals (largely rice and ragi), with limited quantities of pulses and vegetables, these often replaced by the wild edible vegetables and leaves. Equally, the choice of fruit was restricted to bananas and coconut, the reason for which was said to be the high price of other fruits. Similarly, very few of the households studied, particularly those owning livestock reported that they had consumed livestock products in the month ***surveyed***. The majority did consume fish, obtained almost entirely from markets.

There are various governing factors behind food vulnerability among both the tribes. The foremost cause was the lack of assets which could act as a buffer and could result in income generation during periods of crisis. The Jenu Kuruba are regarded as more prone to such vulnerability than the Koraga, but the inland location of the latter often provides them with access to mainstream occupations such as ***agricultural*** labour and quarry-related work, thus creating at least some income. It was noted that for the traditional livelihood occupations (honey collection for the Jenu Kuruba and basketry for the Koraga) the income received is very small and insufficient to support households given the rise in food prices outside the PDS. Furthermore, once the traditional occupations become jeopardised – in this instance, because of incessant rainfall – income generation is automatically stifled. ***Agricultural*** production determines food availability, but the absence of land assets has made life more difficult. However, the Jenu Kuruba were allocated 2.5 acres (just over 1 hectare) of land to cultivate by the government, although few now retain the land and the remaining land-holding families have mortgaged it to non-tribals. Whilst some have tenancy rights over the land, it is controlled by the non-tribals and thus those from the tribe are no more than labourers. Some often ask the non-tribals for seeds and ***agricultural*** equipment, to grow certain crops such as paddy (rice), tobacco and pulses, with production is distributed equally between them. The reason for mortgaging the ***agricultural*** land was reported to be the absence of ***agricultural*** knowledge, as well as poverty. It is the sole reason why consumption of food from own-farms was low. As a result, food is purchased from markets, at higher prices. However, the PDS, ICDS, and Free Nutrition Scheme and forest resources continue to offer both hope and food.

The availability of food does not guarantee it being accessible: this latter is governed by the abilities, networks, knowledge and availability of transport at household level. However, households do receive resources, for instance through the Free Nutrition Scheme and other pro-poor delivery services; but lack of information often prevents them from accessing the food because none of the families were found to be linked to any food institutions. This is largely attributed to their remote location. Whilst aware of their food entitlement, both from the PDS and the Free Nutrition Scheme, they are sometimes given less than their due entitlement. The majority do not receive sugar – not because of a lack of purchasing capacity but rather to politics. Some of the beneficiaries reported have seen the abundance of sugar in the PDS store, with the non-tribals given more than they needed. Thus it is the power hegemony that controls food distribution in this region. Because the majority migrate to Kodagu district during the monsoon, it becomes difficult for them to return to their village on a fixed date in order to collect their rations – the shop is opened for just two days a month. In such cases they are not entitled to receive their full quota: this doubles their vulnerability because they are obliged to purchase rations from the markets, at higher prices. Their remote location and convoluted communications affect their access to food, particularly during monsoon. For instance, because many Koraga hamlets are located away from PDS stores, it becomes difficult for eligible households to draw their full quota or access rations, for which they might spend around ₹100 on transport (typically an auto rickshaw) to bring the rations back to their homes. As such it is difficult for a single household alone to bear transport cost and thus 4–5 families may jointly hire an auto-rickshaw in order to reduce their per capita transportation cost. For the Jenu Kuruba tribe residing inside the Nagarhole National Park, there are problems with the food delivery van not being able to reach the village during the monsoon season. When this happens some of the families very often skip their meals or depend on forest food as the only option to survive, because the rations provided by the PDS do not normally last for a full month.

The analysis of various coping strategies adapted by the Jenu Kuruba and the Koraga are always regarded as playing the ‘advocacy role’ and form a set of patterns in their livelihood framework. All forms of coping strategies have become a structure and system, in an institutional way. Although many of the strategies are short term, they always become expressions of negotiated decisions to minimise the risks and shocks arising from food shortages at household level. The traditional food-based institutions such as intra-household food distribution continue to play a dominant role in food security strategy, particularly so given the limited assets of the households. To some extent, however, the social transformation and individualism have altered such relationships.

Unlike food consumption, the adoption of definite coping strategies has been visualised using a behavioural model in which adjustment to the situation becomes both proactive and reactive. The reactive strategy is visible in terms of the short-term migration to the Kodagu district, switching to non-traditional-based activities, reduction in food intake, skipping meals and the purchase of less-preferred foods. The proactive strategies, in contrast, are generally surrounded in their societal spheres. Because adoptive behaviour is more cultural among both tribes, the inclusive responses to food insecurity that were seen are more cultural, evidence of which is reciprocity, intra-household food distribution, borrowing from friends and neighbours, and so on. However, the level of inclusive response is dependent upon the level of social groups, which can be households, kin groups, communities and extra-communities and networks. In this regard social distance is found more among the Jenu Kuruba than the Koraga, due to the former’s location, and thus the Jenu Kuruba are more prone to food vulnerability. In the proactive form of adoption both communities thus attempt to rethink the establishment of traditional food institutions, as shown in the example of intra-household food distribution.

There is a significant relationship in both tribes between income diversification and the level of adoption of particular coping strategies. The lower income group largely seeks short-term strategies in overcoming food vulnerability compared to higher income groups. Analysis of the adoption strategies used by both tribes clearly indicates that the choice of survival strategy, or strategies, is strongly influenced by the level of human capital at household level. The higher the household’s level of human capital, the more likely it is to choose active strategies. It is also the case that each coping strategy adopted has specific implications with regard to contributing to their food basket.

Risks and uncertainty are common characteristics of tribal and rural people; they are also the reason for various interlinking factors. The traditional occupations, once played an important role in the livelihoods of both tribes, now under threat due to decreasing market choice. The disorganisation of traditional food-based institutions together with the disruption of contemporary social networks, social transformation and individualism have exposed people to economic shocks because their ability to cope with risks became severely limited. But, given the social and economic transformation imposed by various factors, we must question how far the coping strategies adopted by both tribes can translate their livelihood. Does the system permit their adaptability to be sustainable? A more resilient system implies greater flexibility, but resilient systems are also defined as those able to maintain their integrity and reorganize while undergoing change. Thus the definition of adoption itself provides a way of assessing whether the ability to diversify is meaningful, but the question then is whether or not it contributes to an increase in the number of options and flexibility for both tribes, in order to maintain system integrity and to renew and reorganize through processes of change. Thus, the thresholds of the mechanism adopted by both tribes cannot be compromised with the changing scenario. Understanding these coping strategies for dealing with food insecurity will be a good starting point from which systematically to develop and formulate robust and contextually sensitive direct indicators for measuring household food insecurity across the country. When assets become important in their livelihood concept, lack of knowledge and fear of becoming mainstreamed seem time and again to confuse their livelihoods. People generally cannot accommodate all stresses and shocks, given the constant change communities face. Rather, given the existence of vulnerability as a result of lack of resources and the dysfunctioning of traditional food-based institutions, a multipronged approach is needed in the region studied, in which distribution of land and development of skills can help, leading to better economic development.

To conclude, the coping strategies adopted are no more than economic behaviour to minimise the risk and maximise the chances of survival. All the coping methods had a positive effect on the livelihoods of the tribes concerned, but some of the strategies, such as depending on local traders and purchasing food on credit, remain questionable due to the exploitative nature of such arrangements. The only factor that forces reliance on such a strategy is the absence of sources of income. It does not mean that provision of material support, rather than altering levels of food consumption, can solve the problem of food security. It is therefore food consumption as a cultural expression and the need to strengthen food-based institutions, as well as supplying culturally appropriate food, that can challenge food vulnerability: talking about food security is otherwise meaningless.

**Notes**

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[***Public housing and educational attainment in Asia's global city: An empirical study of Hong Kong***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:6BGY-HK51-JBMY-H3MJ-00000-00&context=1516831)

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**ABSTRACT**

In recent years, the relationship between public housing and children's educational attainment has been a hotly debated topic in urban housing and education policy studies. Most studies on the subject have been based on experiences in western cities characterized by a diminishing and residualized public housing sector. It remains unknown whether the same mechanisms identified in the extant literature can be applied to make sense of the situation in alternative social and housing contexts. This study assesses the impact of public housing residence on the educational achievement of children in Hong Kong within a stable and resilient public housing sector. A propensity score matching estimation reveals that children aged 19–22 living in public housing are less likely to study for a degree in a local university and more likely to be not in employment, education or training than their private housing counterparts. Given the favorable physical and neighborhood environment characterizing public housing in Hong Kong, this negative relationship tends to suggest an account in connection with the restricted access to high-performing schools for public housing children. The paper challenges the perceived notion about the unambiguously positive social impact of public housing scheme in the context of Hong Kong. The case study points to the need for a place-specific analysis of the variegated mechanisms linking public housing with children's education. It highlights the practical implications for a closer integration of public housing and public school policies in Hong Kong.

**FULL TEXT**

**Introduction**

The relationship between public housing and children's educational attainment has been a hotly debated topic in housing and education policy studies in recent years. This is in part because of the increasing awareness that a stable, affordable, and supportive housing environment is equally important, if not more than the efforts of school educators, for children's educational achievement (Brennan, 2011; Cunningham and MacDonald, 2012). As the locus of the initial socialization of the child and the place where a child's character is largely shaped, housing and its surrounding neighborhood goes beyond providing basic shelter to involve several interrelated dimensions that can significantly improve or hinder a child's physical, social, emotional, behavioral, and cognitive development. It is therefore increasingly recognized by educational policy makers that in addition to in-school factors (e.g. class size, teacher qualification, school curriculum), out-of-school factors such as housing policy and neighborhood planning are also non-negligible forces that may influence children's well-being and educational outcomes. The posited link between housing and child development has underpinned various government initiatives to address the issues of educational inequality and child poverty through intervention in housing policy.

The heightened research interest in public housing and children's educational outcomes is also driven by the ongoing debate about the social impact of public housing program. Public housing was originally planned and developed to accommodate low-income households with the intended objective of yielding important social benefits to both occupants and society in terms of better health, fewer behavioral problems, greater educational attainment, and increased labor force participation. However, public housing projects in developed countries have in recent decades been considered failures of social policy that have created or exacerbated the problems of concentrated poverty, residential segregation, and other urban social pathologies (Crump, 2003; Massey and Kanaiaupuni, 1993; Newman, 2008). As a result, the dominant trend of changes in public housing policies since the 1980s in the European and North American contexts has been to relocate low-income families out of public housing and disperse them in socially mixed neighborhoods through various policy initiatives, such as the moving to opportunity program, the HOPE VI program, and other tenant-focused voucher schemes (Briggs et al., 2010; Crump, 2002). This negative portrayal of public housing as “islands of decay and poverty” (cf. Wyly and Hammel, 1999) by media, state, and academic discourses, while powerful and compelling, has recently been criticized by some critical scholars for its thin empirical base and restricted view of the social impact of public housing (August, 2014; Manzo et al., 2008; Samara et al., 2013). According to these critical perspectives, public housing plays a vital role in sustaining geographically rooted social support networks and relations upon which sitting residents especially those from low-income families depend. Against such theoretical controversy, children's educational attainment serves as an important social context for empirical investigation and substantiation.

To date, most of the empirical studies to quantify the causal relationship between public housing residence and children's educational outcomes are based on experiences in western cities characterized by a diminishing and residualized public housing sector. A large body of research has identified the presence of several key dimensions of children's housing circumstances that are associated with their educational performance, including house size, quality, affordability, and neighborhood social composition (Aratani, 2010; Currie and Yelowitz, 2000; Newman, 2008; Newman and Harkness, 2000). However, the overall empirical evidence with regard to the educational outcomes for children living in public housing remains mixed and inconclusive (DeLuca and Dayton, 2009). The ambiguity of such empirical findings has led some scholars to suggest that “the mechanisms through which the *housing* environment becomes salient in a child's life are likely to be different across unique geographic, social and historical contexts” (Sharkey and Faber, 2014: 566, italics added). On this understanding, what we should focus on is not a dichotomous question of whether public housing matters, but rather a move towards the questions of “when, where, why, and for whom do residential contexts matter” (p. 562). Informed by such perspective, more research is needed on the relationship between public housing and children's educational performance in alternative geographical and housing contexts.

The operation of public housing in East Asia in general and Hong Kong in particular stands out as an appropriate setting for further research. Public housing in Hong Kong was triggered initially by a disastrous fire in the Shek Kip Mei squatter area on Christmas Eve 1953. It has since then developed into one of the largest welfare programs of its kind in the developed world, accommodating 46.5% of Hong Kong people by the end of 2013 (Yip, 2013). While public rental housing (PRH hereafter) systems in many other parts of the world have been deregulated, privatized, downsized, and residualized, public renting sector in Hong Kong has not only survived but arguably thrived over the last three decades or so (Forrest and Yip, 2014). Contrary to the stereotypical image of public housing as places of isolation, disorganization, and despair, public housing in Hong Kong, for most of its six-decade history, was regarded as decent accommodation by the general public (Lee and Yip, 2006). In a celebrated study of housing development in Hong Kong, Castells et al. (1990) attributed much of Hong Kong's socio-economic success to its public housing programs that plays a key role in “ensuring a proper production and reproduction of labor, in making labor cheaper without lowering its quality, in providing a safety net that has enabled an entrepreneurial population to take risks by investing and creating business” (p. 4). In addition, the investigation of the actual experience of public housing families conducted by Lee and Yip (2006) suggested that public housing in Hong Kong serves as a facilitating agent of neighborhood and social capital formation, educational opportunities, as well as domestic production and small business ventures. A more recent ***survey*** by Forrest and Yip (2014) revealed a generally strong level of support for the public rental sector and a positive attitude to its contribution to social equality. For many homeowners and the current governing and business elites in Hong Kong, who were typically raised in public housing estates before achieving upward social mobility in their subsequent life course, public housing constitutes a part of their indelible collective memory. The growth and resilience of public housing in Hong Kong against the continued stagnation and decline of the sector in western countries thus provide an invaluable context to interrogate the controversial relationship between public housing residence and children's educational attainment. Given the oft-praised model of PRH development in Hong Kong and its posited impact on progressive social change, can we identify a similar positive relationship in the area of children's education?

Against the above research backdrop, this paper aims to examine the concrete impact of public housing residence on children's educational attainment in Hong Kong, Asia's world city where the emergence and development of public housing system appears to have been shaped by distinct political, economic, and social factors. In this paper, we use Hong Kong's latest ***census*** to assess whether living in public housing is an advantage or disadvantage for children's educational achievement and to explore the possible mechanisms behind. The empirical results suggest that there are significant differences in post-secondary educational attainment between children living in public housing and their counterparts in private housing in Hong Kong. Propensity score matching estimation revealed that children aged 19–22 living in public housing were less likely to study for a degree in a local university and more likely to be not in employment, education or training (NEET) than their private housing counterparts. Rather than the result of its unfavorable physical and neighborhood environments, this negative impact of public housing residence on children's educational attainment in Hong Kong is more likely be associated with the location of public housing projects and the inflexible mechanism of public housing unit allocation, which restrict public housing residents' access to high-performing schools.

This paper is organized as follows. The next section is a review of the extant literature on the connection between public housing residence and children's educational achievement. This is followed by a discussion of the ***data*** and methodology of this study. The next section describes the empirical results. The paper concludes with important policy implications for the planning and management of Hong Kong's public housing and school systems.

**Public housing and educational attainment: A contested terrain**

Despite the common recognition that housing matters for children's academic achievements, the existing studies to quantify their interrelationship are divided over the nature, magnitude, and mechanisms through which housing and its surrounding neighborhood might influence the educational trajectories of children living there (Brennan, 2011; Cunningham and MacDonald, 2012; Lubell and Brennan, 2007; Newman, 2008). This is partly because housing as a “housing bundle” is made up of many different dimensions, such as housing stability, affordability, quality, and neighborhood community, all of which may influence the socio-economic outcomes of children and youth in different ways (Cunningham and MacDonald, 2012; Newman, 2008). In this sense, the impact of public housing on children's educational outcomes has to be unbundled by examining the following dimensions.

**Physical condition**

Studies focusing on this dimension have examined the attributes of dwelling units, such as safety, ventilation, and size. Existing studies have found that children growing up in overcrowded housing have lower math and reading scores, complete fewer years of education and are less likely to graduate from high school than their peers (Conley, 2001). Research suggests that overcrowding may lead to a lack of space for homework, reduce parental responsiveness by creating social overload and withdrawal, and increase noise and chaos that interfere with children's studies and cognitive development, which are all negatively related to educational achievement (Brennan, 2011). In addition, housing of substandard quality may cause or exacerbate children's health problems, which result in high levels of absenteeism and reduced school performance (Krieger and Higgin, 2002). In general, factors related to physical housing quality may influence both the physical and mental health conditions of children living there, which in turn can affect children's school attendance rates, class attentiveness, and overall academic performance (Conley, 2001; Goux and Maurin, 2005; Krieger and Higgin, 2002).

**Housing affordability**

A lack of affordable housing can lead to difficult choices in household budgets between paying the rent and paying for food and other necessities. Families with affordability issues may choose lower quality housing to make up for the gap in income (Cunningham and MacDonald, 2012). Given that housing constitutes the biggest expenditure in the household budget, residents living in affordable housing can use the freed-up household resources for non-shelter expenditures, particularly expenditures that could potentially benefit a child's development (Harkness and Newman, 2005).

**Residential stability**

Many studies have documented the negative impact of frequent residential moves on children's educational achievement (Scanlon and Devine, 2001). Potential explanations for these negative consequences include disruptions in the children's instruction caused by changing schools, excessive absenteeism related to a move, stress caused by a move, disruption of peer networks and interference with the development of close personal relationships (Brennan, 2011). In this regard, stable and affordable housing may contribute to children's educational achievement by reducing the frequency of unplanned moves that lead children to change schools and negatively affect their academic well-being (Lubell and Brennan, 2007).

**Neighborhood effects**

In addition to the attributes of individual dwelling units, features of the surrounding neighborhood also matter to children's educational attainment through neighborhood-level social characteristics such as social relations and networks, social norms, collective efficiency, institutional resources, and routine activities (Chaskin et al., 2013). Following Wilson's (1987) theoretical formation, research has generally found that children growing up in more disadvantaged neighborhoods fare worse across a variety of social and economic outcomes (Brooks-Gunn et al., 1993; Ellen and Turner, 1997). As the proximate physical and social environment to which a child is continually exposed, the home neighborhood can exert its effects through different mechanisms. In terms of neighborhood physical environment, accessibility to high-quality public services and facilities (e.g. after-school programs) can have a positive impact on children's educational achievement. Neighborhood communities with strong school systems may have a positive impact on educational achievement because studies have found that low-income children who attend high-performing schools with middle- and upper-income children do better academically (Schwartz et al., 2010). Furthermore, living in high-poverty, socially disorganized neighborhoods may expose children to negative peer influences and lead them to develop an oppositional culture and anti-social behavior that devalues schooling and discourages academic success (Sampson et al., 2002).

Following the above conceptualization, the real impact of housing on children's educational attainment is the collective outcome of its affiliated dimensions. The effect of public housing is often manifested in two different causal mechanisms in western countries. On the one hand, public housing keeps rents low, minimizes residential instability, and offers residents less crowded residential environments than they could afford in the private market. All of these might help children achieve better educational outcomes. Moreover, by charging low rent, public housing leaves families with more disposable income. This in turn reduces parental stress and the need for parents to work multiple jobs with long hours, and allow for greater parental involvement in their children's education (Lubell and Brennan, 2007). On the other hand, the disproportionate concentration of the poor in public housing estates in western cities may leave children without positive role models for strong educational performance and expose them to higher rates of crime and other socially deviant behavior. Moreover, in the context of tight financial constraints and budgetary shortfalls, public housing estates in the west often report deterioration and obsolescence. Substandard housing conditions and disadvantaged neighborhood environments may negatively affect the physical and psychological development of children and undermine their academic achievement.

The interaction of these two causal mechanisms has led to mixed and inconclusive results in empirical studies (Currie and Yelowitz, 2000; Jacob, 2004; Katz et al., 2001; Leventhal and Newman, 2010; Newman and Harkness, 2000; Oreopoulos, 2003). Different empirical results mainly arise from differences in research design and methodological choices to control for the unobserved characteristics of public housing residents (e.g. gender, duration of stay in public housing, and age group) and communities (e.g. accessibility to high-performing schools) (Aratani, 2010; Cunningham and MacDonald, 2012; Schwartz et al., 2010).

Most of the empirical studies on public housing and children's educational attainment have been based on experiences in North American and European countries, where ideological attack and fiscal austerity have led governments to distance themselves from direct housing provision. Little work has been done in alternative spatial and housing contexts such as Hong Kong, where the subsidized public rental sector has more than survived. More specifically, public housing development in Hong Kong presents several distinctive features from its western counterpart. First, whereas public housing estates in many western countries are characterized by physical decay, dilapidation, and inadequate maintenance because of reduced investment, the quality of pubic rental flats in Hong Kong has been continuously improved in the last three decades. This even led to the criticism that the quality improvement was beyond adequate (Yeung and Wong, 2003). The good design and reasonably high construction standards as well as the accessibility to institutional facilities offered by the PRH estates are comparable to, if not better than, many private-sector estate-type housing developments (Lau, 2004; Li, 2011). As Lau (2004) commented:

It is now common to find PRH blocks in Hong Kong installed with main entrance gate, door phone system, closed circuit television in lifts, and main entrance foyer, and a 24-hour security staff services at the main entrance. Such up-grading has further enhanced the image of the pubic rental housing sector as a desirable place for accommodation and not a residualized community. (p. 18)

Therefore, it is not surprising that the 1996 customer satisfaction ***survey*** showed that over 70% of PRH respondents were satisfied with the overall living conditions of their flats (cited in Lau, 2004: 4). A more recent ***survey*** by Forrest and Wu (2014) came to similar conclusions: when asked to rate their own housing situation on a 10-point spectrum, PRH tenants gave the second highest average score among all tenant groups.

Secondly, contrary to the residualization and marginalization of public housing communities as stigmatized places spatially separated from middle-class communities in developed economies, public housing communities in Hong Kong are characterized by a good social mix of low-income and middle-class families. This is the unintentional outcome of several factors, such as (1) the historical legacy of the early policy, which permitted people affected by clearance and redevelopment programs to live in PRH without going through means tests; (2) the general criteria of housing subsidy policy, which allows better-off tenants to continue to stay in PRH; (3) the introduction of the tenant purchase scheme, which ensures that well-off tenants stay in the community after purchasing their rented units (Lau, 2004); and (4) the urban planning policy, which introduced private-sector residential development for middle-class tenants in the public housing-led new town development process in order to recover high project costs and achieve financial balance (Forrest et al., 2004). As a result, public housing development in Hong Kong does not lead to the undesirable phenomena of poverty concentration and social segregation that have been observed in the west (Delang and Lung, 2010; Monkkonen and Zhang, 2011).

The favorable physical and neighborhood environments characterizing PRH in Hong Kong, together with its heavily subsidized rent, have made PRH a sought-after accommodation option for low-income families, as evidenced by close to 255,800 families and individuals on the PRH waiting list at the end of June 2014. With a generally positive attitude toward the social impact of PRH in Hong Kong, the relationship between public housing residence and children's educational outcome in this Asian's global city constitutes an intriguing case to investigate the specific mechanisms that link residential contexts with children's academic outcomes.

**Methodology**

***Data***

Theoretically, the best way to examine the effect of public housing residence on children's educational attainment is to randomly assign children to public and non-public housing and to evaluate their educational outcomes. However, the high cost and implementation difficulty associated with experimental studies entail the necessity of evaluation studies using observational ***data*** on certain occasions. Specifically, in order to test the relationship between public housing and educational attainment, this study uses the 5% sample of the 2011 Hong Kong Population ***Census*** to compare the patterns of children's educational outcomes between public and private housing occupants.1 The 2011 Population ***Census*** was conducted by the ***Census*** and ***Statistics*** Department of the HKSAR Government in July and August 2011. The 5% sample is used because it is the largest made available to the public by the ***Census*** and ***Statistics*** Department.

We focus on four groups of children: those aged 3–5 (*n* = 6,436); 5–19 (*n* = 41,675); 13–19 (*n* = 23,366); and 19–22 (*n* = 13,746). Different variables are extracted from the 2011 ***census*** ***data*** to measure the educational performance of youth in different age groups. For children aged 3–5, educational outcomes are measured by whether they were attending kindergarten at the time of the ***census***. For those aged 13 to 19, academic performance is measured by whether they were still in school or had completed secondary school (Form 5). Two variables were used to measure the educational attainment of youth between 19 and 22 years old: one is whether they were studying for or had completed a bachelor degree in a local university; the other is whether they were NEET. For youth aged 5–19, general educational achievement is measured by whether or not they were in full-time education. It should be acknowledged that educational attainment involves not only school attendance rate but also students' academic scores on standardized tests. Previous studies have used one or more of the following indicators to measure educational attainment, namely years of education, high school graduation, college attendance, standardized reading and math test scores, grade repetition (Aratani, 2010; Currie and Yelowitz, 2000; Newman and Harkness, 2000; Schwartz et al., 2010). Given ***data*** availability, in this paper we use indicators related to school attendance to measure the educational attainment of children.

To measure the differences between public and private housing occupants that might affect our outcome variables, this study extracts some observed variables from the ***census***, including individual characteristics (age, gender, and place of birth), parental characteristics (age, ethnicity, place of birth, education level, occupation, and migration-related attributes), and household characteristics (household income, household size, gender of the head of household, number of older persons aged 65 and above living in the household, district of residence, and residence change during the past five years).

A major methodological challenge in using non-experimental ***data*** to evaluate the effects of public housing residence is the problem of self-selection bias (Currie and Yelowitz, 2000; Monkkonen, 2011). In addition to the observed variables that are mentioned above, households in PRH in Hong Kong are still likely to differ from those in private housing on unobserved and even unobservable factors. To the extent that these unmeasured variables affect both the selection of households into public housing residence and children's educational outcomes under investigation, the failure to control them could lead to biased results. For example, parents of households in public housing may have attitudes, values, aspirations, or other personality traits towards their children different from their private counterparts. These unobserved characteristics may have an impact on children's educational attainment and therefore have to be controlled in order to truly test the effect of public housing residence. One way to control such selection bias in traditional regression models is to find an instrument variable that is correlated with the tendency for selection into public housing residence, but does not have a direct impact on children's educational outcomes.2 However, it is not easy task to find an effective and desirable instrument variable. Following the methodology of previous similar studies (Aratani, 2010; Harding, 2003), this paper chooses instead to use propensity score matching approach, first introduced by Rosenbaum and Rubin (1983), to address such bias by creating a matched sample of households living in public housing that is comparable on all observed characteristics to a sample of households living in private housing.

In practice, the propensity score matching estimation is implemented in two steps. In the first step, the propensity score is estimated, in which the probability of living in public housing in Hong Kong is estimated by probit regression with the inclusion of individual, parental, and household socio-economic characteristics. Then the samples from those who live in public housing (treat group) are matched to those living in private housing (control group) who share the closest propensity score, using the nearest neighbor matching method without replacement. The matching exercise is meant to mimic randomized experimental studies to ensure the comparison of households in public and private housing that are as similar as possible. In the second step, the average impact of public housing residence on children's educational attainment is then estimated by comparing children's educational outcomes between treat and control groups on the basis of the new matched sample.

**Results**

There are two major types of public housing in Hong Kong: PRH and subsidized sale flats. The Hong Kong government provides PRH to low-income families who cannot afford rental accommodation in the private housing market. To prevent abuse of the system, the eligibility criteria for PRH include means testing and a residency requirement. The monthly income and asset limits for a four-person household in 2012 were HK$20,710 and HK$418,999, respectively, and at least half of the family members must have resided in Hong Kong for seven years.

The subsidized sale flat policy was initially introduced early in the late 1970s, including living quarters built under the Home Ownership Scheme, the Private Sector Participation Scheme, and the Tenant Purchase Scheme introduced by the Hong Kong Housing Authority, as well as the Flat-for-Sale scheme and Sandwich Class Scheme of the Hong Kong Housing Society (HKSAR, 2013). In this study, these two types of flat are lumped together as public housing units for comparison with units rented or sold in the private housing market.

Hong Kong's school system consists of pre-school education, primary education, secondary education, and tertiary education. Before the implementation of educational reform in 2012, a student would normally spend three years in pre-school aged 3–5, six years in primary school aged 6–11, seven years in secondary school during aged 12–18, and three years in local university during aged 19–21 before receiving a bachelor degree. Based on this time frame, different indicators are designed to measure the educational attainment of children in different age groups in order to better understand the potential impact of living in public and private housing.

**Bivariate analysis**

Table 1 presents the results of the bivariate analysis between children living in public and private housing across different age groups in terms of educational outcome, individual, household, and parental characteristics. There were significant differences in educational attainment between children living in public and private housing in all age groups. Among children living in public housing estates, 90.18% of those aged 3–5 were in kindergarten; 96.67% of those aged 13–19 were in secondary school or had completed Form 5, passing the Hong Kong Certificate of Education Examination (HKCEE); 15.84% of those aged 19–22 were studying in local universities or had completed bachelor degree courses in local universities; overall, 93.77% of those aged 5–19 were in full-time education. Table 1.A summary description of the characteristics of children living in public and private housing by age group.

| **Age group** | **3–5** | **13–19** |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Housing** | **Private housing (n = 4001)** | **Public housing (n = 2435)** | **Chi-square or t-test value** | **Private housing (n = 10,801)** | **Public housing (n = 12,565)** | **Chi-square or t-test value** |
| **Educational attainment** |  |  |  |  |  |  |
| Studying in kindergarten | 91.65% | 90.18% | 3.84\* |  |  |  |
| Studying or completed F5 |  |  |  | 98.13% | 96.67% | 48.15\*\* |
| **Child characteristics** |  |  |  |  |  |  |
| Age | 3.9605 (0.8234) | 4.0505 (0.8190) | −4.27\*\* | 15.9602 (1.9871) | 16.2239 (1.9600) | −10.18\*\* |
| Male | 51.46% | 52.94% | 1.32 | 50.64% | 51.52% | 1.80 |
| Born in Hong Kong | 92.33% | 94.62% | 12.55\*\* | 82.51% | 75.20% | 184.39\*\* |
| Language usually spoken at home |  |  |  |  |  | 335.25\*\* |
| Mandarin |  |  |  | 0.68% | 0.45% |  |
| Cantonese |  |  |  | 92.84% | 95.83% |  |
| English |  |  |  | 3.19% | 0.21% |  |
| Others |  |  |  | 3.29% | 3.50% |  |
| **Household characteristics** |  |  |  |  |  |  |
| Number of older persons |  |  | 103.84\*\* |  |  | 114.53\*\* |
| 0 | 91.03% | 82.51% |  | 90.69% | 86.17% |  |
| 1 | 7.35% | 13.80% |  | 7.77% | 11.61% |  |
| 2+ | 1.62% | 3.70% |  | 1.55% | 2.22% |  |
| Household income (HK$) | 56,056 (41,071) | 23,420 (16,781) | 44.53\*\* | 48,406 (39,569) | 21,586 (13,963) | 66.95\*\* |
| Household size | 4.5729 (1.1991) | 4.5244 (1.2055) | 1.57 | 4.3081 (1.0078) | 4.2945 (0.9527) | 1.06 |
| Male head of household | 77.83% | 68.99% | 62.20\*\* | 80.26% | 82.16% | 13.72\*\* |
| **District of residence** |  |  | 1155.35\*\* |  |  | 4740.16\*\* |
| Central and Western | 6.27% | 0.25% |  | 5.96% | 0.12% |  |
| Wan Chai | 3.67% | 0.00% |  | 3.35% | 0.00% |  |
| Eastern | 9.20% | 5.67% |  | 10.08% | 5.98% |  |
| Southern | 3.82% | 3.74% |  | 4.69% | 3.11% |  |
| YauTsimMong | 7.77% | 1.19% |  | 6.61% | 0.67% |  |
| Sham Shui Po | 6.35% | 3.37% |  | 6.07% | 4.04% |  |
| Kowloon City | 8.20% | 1.48% |  | 9.37% | 1.40% |  |
| Wong Tai Sin | 1.72% | 9.28% |  | 1.93% | 9.22% |  |
| Kwun Tong | 4.72% | 13.68% |  | 4.94% | 12.09% |  |
| Sai Kung | 6.55% | 7.89% |  | 4.56% | 8.36% |  |
| Tsuen Wan | 7.07% | 1.89% |  | 7.25% | 1.70% |  |
| TuenMun | 4.72% | 8.75% |  | 5.24% | 8.95% |  |
| Yuen Long | 7.90% | 9.94% |  | 8.42% | 11.29% |  |
| North | 4.37% | 4.19% |  | 4.00% | 5.68% |  |
| Tai Po | 3.87% | 3.04% |  | 4.13% | 4.12% |  |
| Sha Tin | 6.42% | 11.05% |  | 8.04% | 10.05% |  |
| Kwai Tsing | 4.25% | 11.83% |  | 3.29% | 10.61% |  |
| Islands | 3.10% | 2.79% |  | 1.78% | 2.61% |  |
| **District of residence different from 5 years ago** |  |  |  | 29.39% | 13.40% | 901.07\*\* |
| **Paternal characteristics** |  |  |  |  |  |  |
| Age | 39.8683 (6.1042) | 40.2370 (7.5247) | −2.04\* | 50.0217 (5.8319) | 50.9392 (7.1864) | −10.77\*\* |
| Ethnic Chinese | 91.48% | 97.04% | 78.09\*\* | 96.75% | 98.65% | 96.84\*\* |
| Born in Hong Kong | 67.43% | 60.90% | 28.36\*\* | 65.16% | 47.54% | 731.06\*\* |
| Years of schooling | 13.5419 (3.5902) | 10.4817 (3.3573) | 33.77\*\* | 11.6254 (4.0747) | 8.3803 (3.4184) | 65.33\*\* |
| Occupation |  |  | 1004.85\*\* |  |  | 4020.23\*\* |
| Managers and administrators | 25.44% | 5.13% |  | 20.58% | 3.41% |  |
| Professionals | 13.22% | 3.20% |  | 7.48% | 0.71% |  |
| Associate professionals | 21.67% | 14.99% |  | 19.60% | 8.17% |  |
| Clerical support workers | 4.97% | 8.09% |  | 5.03% | 4.74% |  |
| Service and sales workers | 11.10% | 14.13% |  | 10.18% | 12.22% |  |
| Skilled ***agricultural*** and fishery workers & craft and related workers | 8.15% | 17.37% |  | 11.47% | 20.55% |  |
| Plant and machine operators and assemblers | 5.05% | 12.28% |  | 7.56% | 14.87% |  |
| Elementary occupations | 4.00% | 12.11% |  | 6.70% | 16.32% |  |
| Unemployed or economically inactive | 6.40% | 12.69% |  | 11.39% | 19.00% |  |
| Language usually spoken at home |  |  | 139.76\*\* |  |  | 280.17\*\* |
| Mandarin | 1.62% | 0.09% |  | 0.74% | 0.37% |  |
| Cantonese | 85.95% | 92.36% |  | 92.65% | 93.35% |  |
| English | 6.40% | 0.49% |  | 2.42% | 0.22% |  |
| Others | 6.02% | 6.24% |  | 4.19% | 6.06% |  |
| **Maternal characteristics** |  |  |  |  |  |  |
| Age | 36.1902 (4.9371) | 34.9162 (5.3084) | 9.59\*\* | 46.2694 (4.9811) | 45.3783 (5.3621) | 13.16\*\* |
| Ethnic Chinese | 92.15% | 96.63% | 52.63\*\* | 96.23% | 98.11% | 75.99\*\* |
| Born in Hong Kong | 58.34% | 37.17% | 271.35\*\* | 62.24% | 37.45% | 1428.55\*\* |
| Years of schooling | 13.2929 (3.5504) | 10.3400 (3.3573) | 33.48\*\* | 11.2026 (3.6301) | 8.6067 (3.2256) | 57.36\*\* |
| Occupation |  |  | 517.13\*\* |  |  | 2500.67\*\* |
| Managers and administrators | 11.37% | 2.05% |  | 7.02% | 1.24% |  |
| Professionals | 7.70% | 1.64% |  | 3.56% | 0.31% |  |
| Associate professionals | 17.07% | 8.54% |  | 14.52% | 4.77% |  |
| Clerical support workers | 12.30% | 13.43% |  | 14.08% | 10.15% |  |
| Service and sales workers | 7.85% | 12.94% |  | 9.68% | 18.01% |  |
| Skilled ***Agricultural*** and fishery workers & craft and related workers | 0.20% | 0.57% |  | 0.90% | 1.74% |  |
| Plant and machine operators and assemblers | 0.30% | 0.12% |  | 0.43% | 0.78% |  |
| Elementary occupations | 1.55% | 4.52% |  | 7.07% | 19.71% |  |
| Unemployed or economically inactive | 41.66% | 56.18% |  | 42.76% | 43.29% |  |
| Language usually spoken at home |  |  | 143.26\*\* |  |  | 272.32\*\* |
| Mandarin | 2.44% | 1.81% |  | 0.98% | 0.60% |  |
| Cantonese | 85.25% | 91.29% |  | 92.36% | 92.50% |  |
| English | 6.20% | 0.29% |  | 2.31% | 0.25% |  |
| Others | 6.10% | 6.61% |  | 4.34% | 6.65% |  |
| **Educational attainment** |  |  |  |  |  |  |
| Studying or completed degree course in local university | 22.65% | 15.84% | 101.54\*\* |  |  |  |
| NEET (not in employment, education or training) | 9.37% | 12.89% | 40.51\*\* |  |  |  |
| Studying in full-time courses |  |  |  | 97.04% | 93.77% | 253.86\*\* |
| **Child characteristics** |  |  |  |  |  |  |
| Age | 20.4619 (1.1233) | 20.5077 (1.1251) | −2.34\* | 12.4256 (4.2580) | 13.2871 (4.1818) | −20.84\*\* |
| Male | 51.46% | 51.36% | 0.01 | 51.07% | 51.47% | 0.66 |
| Born in Hong Kong | 82.98% | 70.31% | 287.18\*\* | 84.74% | 79.26% | 211.64\*\* |
| Language usually spoken at home |  |  | 119.79\*\* |  |  | 923.88\*\* |
| Mandarin | 1.50% | 0.31% |  | 1.02% | 0.59% |  |
| Cantonese | 94.42% | 95.34% |  | 90.16% | 95.45% |  |
| English | 1.69% | 0.11% |  | 4.92% | 0.27% |  |
| Others | 3.39% | 4.24% |  | 3.90% | 3.68% |  |
| **Household characteristics** |  |  |  |  |  |  |
| Number of older persons |  |  | 59.88\*\* |  |  | 232.87\*\* |
| 0 | 89.82% | 85.68% |  | 90.37% | 85.50% |  |
| 1 | 8.92% | 13.20% |  | 7.81% | 11.74% |  |
| 2+ | 1.26% | 1.13% |  | 1.82% | 2.76% |  |
| Household income (HK$) | 46,078 (36,060) | 24,900 (13,737) | 41.82\*\* | 50,714 (40,465) | 21,402 (14,725) | 98.21\*\* |
| Household size | 4.2763 (0.9862) | 4.3395 (0.9437) | −3.75\*\* | 4.4023 (1.0847) | 4.3099 (0.9990) | 9.04\*\* |
| Male head of household | 79.66% | 82.89% | 22.92\*\* | 79.81% | 80.03% | 0.29 |
| **District of residence** |  |  | 2924.34\*\* |  |  | 7803.17\*\* |
| Central and Western | 6.71% | 0.17% |  | 6.07% | 0.17% |  |
| Wan Chai | 3.77% | 0.00% |  | 3.43% | 0.00% |  |
| Eastern | 9.78% | 6.09% |  | 9.52% | 5.93% |  |
| Southern | 4.42% | 3.05% |  | 4.63% | 2.99% |  |
| YauTsimMong | 6.37% | 0.54% |  | 6.84% | 0.82% |  |
| Sham Shui Po | 5.85% | 3.58% |  | 5.84% | 4.25% |  |
| Kowloon City | 9.42% | 1.64% |  | 8.66% | 1.47% |  |
| Wong Tai Sin | 1.97% | 9.02% |  | 1.83% | 9.10% |  |
| Kwun Tong | 4.63% | 10.91% |  | 5.03% | 12.68% |  |
| Sai Kung | 4.40% | 8.18% |  | 5.41% | 8.14% |  |
| Tsuen Wan | 7.52% | 1.44% |  | 6.88% | 1.84% |  |
| TuenMun | 5.47% | 9.03% |  | 5.18% | 8.50% |  |
| Yuen Long | 8.58% | 10.75% |  | 8.87% | 10.99% |  |
| North | 3.77% | 6.08% |  | 4.11% | 5.45% |  |
| Tai Po | 4.60% | 5.72% |  | 4.20% | 3.56% |  |
| Sha Tin | 7.66% | 10.87% |  | 7.83% | 10.25% |  |
| Kwai Tsing | 3.39% | 10.76% |  | 3.53% | 11.00% |  |
| Islands | 1.67% | 21.59% |  | 2.15% | 2.88% |  |
| District of residence different from 5 years ago | 26.15% | 10.20% | 606.98\*\* | 35.57% | 19.14% | 1415.77\*\* |
| **Paternal characteristics** |  |  |  |  |  |  |
| Age | 53.3245 (5.6777) | 54.3517 (6.8973) | −9.53\*\* | 47.1255 (6.8435) | 48.4159 (8.0418) | −17.63\*\* |
| Ethnic Chinese | 97.76% | 99.20% | 51.01\*\* | 94.73% | 98.11% | 344.70\*\* |
| Born in Hong Kong | 59.54% | 40.75% | 468.62\*\* | 66.62% | 51.45% | 991.34\*\* |
| Years of schooling | 10.6537 (4.1632) | 7.6738 (3.4650) | 44.03\*\* | 12.1826 (4.0162) | 8.8295 (4.4702) | 91.11\*\* |
| Occupation |  |  | 2121.82\*\* |  |  | 7302.49\*\* |
| Managers and administrators | 16.93% | 1.92% |  | 22.01% | 3.90% |  |
| Professionals | 5.30% | 0.58% |  | 9.24% | 1.16% |  |
| Associate professionals | 16.84% | 6.39% |  | 20.31% | 9.78% |  |
| Clerical support workers | 4.72% | 3.57% |  | 5.00% | 5.43% |  |
| Service and sales workers | 10.23% | 10.28% |  | 10.78% | 12.50% |  |
| Skilled ***agricultural*** and fishery workers & craft and related workers | 12.85% | 20.10% |  | 10.16% | 20.34% |  |
| Plant and machine operators and assemblers | 8.36% | 14.51% |  | 6.82% | 14.42% |  |
| Elementary occupations | 8.10% | 18.46% |  | 5.92% | 15.14% |  |
| Unemployed or economically inactive | 16.68% | 24.20% |  | 9.78% | 17.34% |  |
| Language usually spoken at home |  |  | 138.91\*\* |  |  | 713.61\*\* |
| Mandarin | 0.75% | 0.37% |  | 1.00% | 0.42% |  |
| Cantonese | 93.21% | 91.95% |  | 90.32% | 93.24% |  |
| English | 1.20% | 0.04% |  | 3.80% | 0.29% |  |
| Others | 4.83% | 7.65% |  | 4.89% | 6.05% |  |
| **Maternal characteristics** |  |  |  |  |  |  |
| Age | 49.7707 (4.7150) | 49.1755 (4.7666) | 7.23\*\* | 43.2502 (6.0605) | 42.7713 (6.3820) | 7.86\*\* |
| Ethnic Chinese | 97.34% | 98.83% | 41.75\*\* | 94.39% | 97.54% | 266.98\*\* |
| Born in Hong Kong | 60.62% | 38.86% | 628.58\*\* | 59.93% | 36.17% | 2357.62\*\* |
| Years of schooling | 10.2262 (3.6365) | 7.7349 (3.3854) | 40.54\*\* | 11.8231 (3.6780) | 9.0340 (3.2152) | 82.41\*\* |
| Occupation |  |  | 1308.45\*\* |  |  | 4504.83\*\* |
| Managers and administrators | 5.13% | 0.71% |  | 8.53% | 1.32% |  |
| Professionals | 2.28% | 0.22% |  | 4.63% | 0.48% |  |
| Associate professionals | 12.01% | 3.13% |  | 15.53% | 5.67% |  |
| Clerical support workers | 12.33% | 7.85% |  | 13.67% | 10.79% |  |
| Service and sales workers | 9.91% | 15.80% |  | 9.09% | 17.05% |  |
| Skilled ***agricultural*** and fishery workers & craft and related workers | 1.47% | 1.97% |  | 0.67% | 1.38% |  |
| Plant and machine operators and assemblers | 0.68% | 0.59% |  | 0.35% | 0.62% |  |
| Elementary occupations | 10.52% | 25.11% |  | 5.08% | 15.12% |  |
| Unemployed or economically inactive | 45.67% | 44.61% |  | 42.45% | 47.57% |  |
| Language usually spoken at home |  |  | 170.07\*\* |  |  | 671.54\*\* |
| Mandarin | 0.90% | 0.48% |  | 1.45% | 0.93% |  |
| Cantonese | 93.00% | 91.13% |  | 89.85% | 92.19% |  |
| English | 1.38% | 0.06% |  | 3.67% | 0.30% |  |
| Others | 4.72% | 8.33% |  | 5.03% | 6.58% |  |

\**p* < 0.05;\*\**p* < 0.01.Note: ***Data*** in parentheses are the standard deviation. Children living in single-parent families are excluded.

Statistical exercises reveal that these indicators were consistently lower among children living in public housing, suggesting that the academic performance of public housing occupants is inferior to their private counterparts. Similar findings can be derived by looking at the proportion of children aged 19–22 who were NEET. The larger value for youths in public housing implies that they were more likely to experience a protracted school-to-work transitioning process and non-engagement than their private counterparts as a result of their poorer educational attainment.

The negative relationship between public housing and children's educational outcomes revealed by the bivariate analysis should be treated with caution because it does not control for differences in household and parental characteristics between public and private housing occupants. In fact, as can be seen in Table 1, the average household income in public housing was consistently lower than that in private housing across the four age groups, and public housing households tended to include one or more elderly persons. Most of the public households were living in a clustered pattern in Kowloon and New Territory. In contrast, the spatial distribution of the private households was more scattered across the whole territory of Hong Kong. In addition, private housing families were more mobile than public housing families as they were more likely to have moved in the previous five years. Compared with their private housing counterparts, parents in public housing households were more likely to be ethnic Chinese and to have shorter years of schooling, less likely to work in professional or managerial occupations and more likely to be skilled or unskilled workers, and more likely to be unemployed or economically inactive.

**Propensity score matching estimation**

Following the methodology mentioned above, the propensity score of living in public housing was estimated by the probit regression model using household and parental information as the independent variables. The result is shown in Table 2 with t-***statistics*** calculated for differences in household and parental characteristics between treatment group (public housing households) and control group (private housing households) both before and after the matching exercise. The lower the t-***statistic***, the better the balance achieved by the new matched sample. The comparison between household and parental characteristics in Table 2 shows a considerable drop in the t-***statistics*** for all included variables after matching, which indicates that treatment and control groups are more comparable in the new sample than in the old.

Based on the matched sample, we estimate three logistic regression models for different age groups by gradually introducing more control variables into the regression. Model 1 controls for the children's individual characteristics, such as age, gender, birthplace, and the language usually spoken at home. Model 2 expands on Model 1 by introducing household characteristics including the number of elderly persons, household income, household size, the gender of the head of household, the district of household residence, and the change of housing residence during the past five years. Model 3 expands on Model 2 by introducing the characteristics of both father and mother such as age, ethnicity, birth place, years of schooling, occupation, and the language usually spoken at home. We tested for multicollinearity between the independent variables and found that the variance inflation factor (VIF) values were acceptable. They were all well below 10 (< 2.0), the usual threshold for multicollinearity. For illustration purposes, the following tables list the significant independent variables only.

The impact of public housing on educational attainment is captured by the coefficient for private housing with public housing as the reference group. As can be seen in Table 3, there was a significant positive association between residence in private housing and school attendance for children aged 3–5 controlling for children's individual characteristics only. However, after adjusting for both household and parental characteristics, the significant relationship between housing tenure and school attendance disappeared. Table 2.Estimated coefficients from probit regression models used to predict propensity scores and balance across treatment and control groups.

| **Estimated coefficients from probit regression models used to predict propensity scores of living in public housing in 2011** | **Balance across treatment and control group before and after matching** |  |  |  |
| --- | --- | --- | --- | --- |
| **Dependent variables: Living in public housing in 2011** | **Unmatched (treat, control)** | **Matched (treat, control)** |  |  |
| **Independent variables** | **Coefficient** | **Standard error** | **t-*statistics*** | **t-*statistics*** |
| constant | 2.2093\*\* | 0.1254 |  |  |
| Age | 0.0057\*\* | 0.0015 | −37.52\*\* | −29.31\*\* |
| Male | −0.0023 | 0.0117 | −0.15 | −0.40 |
| Born in Hong Kong | −0.0050 | 0.0176 | 21.55\*\* | 15.10\*\* |
| Language usually spoken at home |  |  |  |  |
| Cantonese (ref.) |  |  |  |  |
| Mandarin | −0.2717\*\* | 0.0821 | 7.37\*\* | 5.77\*\* |
| English | −0.4414\*\* | 0.0910 | 34.28\*\* | 26.86\*\* |
| Others | −0.3131\*\* | 0.0496 | 2.57\* | 0.38 |
| Household characteristics |  |  |  |  |
| # of elderly persons aged 65+ |  |  |  |  |
| 0 (ref.) |  |  |  |  |
| 1 | 0.1916\*\* | 0.0219 | −15.15\*\* | −7.50\*\* |
| 2+ | 0.1445\*\* | 0.0417 | −3.90\*\* | −2.23\* |
| Log household income | −0.4267\*\* | 0.0114 | 120.02\*\* | 95.34\*\* |
| Household size | 0.0334\*\* | 0.0065 | 17.91\*\* | 15.84\*\* |
| Male head of household | −0.0512\*\* | 0.0161 | 11.65\*\* | 10.10\*\* |
| District of residence |  |  |  |  |
| Central and Western (ref.) |  |  |  |  |
| Eastern | 1.8124\*\* | 0.0673 | 17.30\*\* | 13.38\*\* |
| Southern | 1.9797\*\* | 0.0710 | 7.74\*\* | 5.55\*\* |
| YauTsimMong | 0.4562\*\* | 0.0736 | 45.25\*\* | 40.41\*\* |
| Sham Shui Po | 1.4716\*\* | 0.0683 | 11.68\*\* | 8.13\*\* |
| Kowloon City | 0.8961\*\* | 0.0704 | 43.28\*\* | 39.65\*\* |
| Wong Tai Sin | 2.8523\*\* | 0.0700 | −41.39\*\* | −19.54\*\* |
| Kwun Tong | 2.3948\*\* | 0.0670 | −34.45\*\* | −27.24\*\* |
| Sai Kung | 2.3663\*\* | 0.0681 | −14.16\*\* | −9.55\*\* |
| Tsuen Wan | 1.0671\*\* | 0.0708 | 32.72\*\* | 29.14\*\* |
| TuenMun | 2.0952\*\* | 0.0674 | −17.44\*\* | −18.89\*\* |
| Yuen Long | 1.8589\*\* | 0.0664 | −9.10\*\* | −13.71\*\* |
| North | 1.9417\*\* | 0.0685 | −7.64\*\* | −10.35\*\* |
| Tai Po | 1.8789\*\* | 0.0695 | 1.01 | −1.84 |
| Sha Tin | 2.3258\*\* | 0.0670 | −13.42\*\* | −11.35\*\* |
| Kwai Tsing | 2.4734\*\* | 0.0678 | −36.87\*\* | −25.34\*\* |
| Islands | 2.0201\*\* | 0.0737 | −3.38\*\* | −4.35\*\* |
| District of residence the same as five years ago | 0.4106\*\* | 0.0140 | −52.66\*\* | −38.70\*\* |
| Paternal characteristics |  |  |  |  |
| Age | 0.0176\*\* | 0.0031 | 7.41\*\* | 8.16\*\* |
| Age\*age/10 | −0.0021\*\* | 0.0004 | −4.95\*\* | −0.83 |
| Ethnicity (Chinese = 1) | −0.0347 | 0.0675 | 7.89\*\* | 7.74\*\* |
| Born in Hong Kong | −0.1052\*\* | 0.0150 | 43.89\*\* | 33.13\*\* |
| Years of schooling | −0.0378\*\* | 0.0021 | 93.66\*\* | 74.84\*\* |
| Occupation |  |  |  |  |
| Unemployed or economically inactive (ref.) |  |  |  |  |
| Managers and administrators | −0.3665\*\* | 0.0319 | 70.58\*\* | 58.14\*\* |
| Professionals | −0.1255\*\* | 0.0446 | 45.92\*\* | 39.23\*\* |
| Associate professionals | −0.1065\*\* | 0.0263 | 39.20\*\* | 31.87\*\* |
| Clerical support workers | 0.0807\* | 0.0323 | 0.54 | −0.85 |
| Service and sales workers | −0.0550\* | 0.0257 | −1.55 | −3.64\*\* |
| Skilled ***agricultural*** and fishery workers & craft and related workers | 0.1086\*\* | 0.0238 | −28.86\*\* | −26.23\*\* |
| Plant and machine orators and assemblers | 0.1908\*\* | 0.0258 | −25.68\*\* | −23.77\*\* |
| Elementary occupations | 0.1479\*\* | 0.0256 | −33.35\*\* | −26.11\*\* |
| Language usually spoken at home |  |  |  |  |
| Cantonese (ref.) |  |  |  |  |
| Mandarin | −0.2607\*\* | 0.0945 | 10.31\*\* | 8.53\*\* |
| English | −0.1248 | 0.1093 | 31.57\*\* | 24.81\*\* |
| Others | 0.0067 | 0.0463 | −4.12\*\* | −1.95 |
| Maternal characteristics |  |  |  |  |
| Age | 0.0149\*\* | 0.0032 | 2.43\* | 2.82\*\* |
| Age×age/10 | −0.0023\*\* | 0.0004 | −1.91 | −0.55 |
| Ethnicity (Chinese = 1) | 0.1119\* | 0.0560 | −9.93\*\* | −6.56\*\* |
| Born in Hong Kong | −0.2080\*\* | 0.0151 | 56.39\*\* | 41.78\*\* |
| Years of schooling | −0.0404\*\* | 0.0022 | 95.31\*\* | 74.49\*\* |
| Occupation |  |  |  |  |
| Unemployed or economically inactive (ref.) |  |  |  |  |
| Managers and administrators | −0.2059\*\* | 0.0377 | 43.89\*\* | 36.50\*\* |
| Professionals | −0.0846 | 0.0561 | 33.53\*\* | 28.17\*\* |
| Associate professionals | −0.0367 | 0.0238 | 42.72\*\* | 36.00\*\* |
| Clerical support workers | 0.0920\*\* | 0.0200 | 12.33\*\* | 7.43\*\* |
| Service and sales workers | 0.2065\*\* | 0.0187 | −25.96\*\* | −21.65\*\* |
| Skilled ***agricultural*** and fishery workers & craft and related workers | 0.0722 | 0.0545 | −6.70\*\* | −6.11\*\* |
| Plant and machine operators and assemblers | 0.0609 | 0.0801 | −3.58\*\* | −3.40\*\* |
| Elementary occupations | 0.3002\*\* | 0.0206 | −42.73\*\* | −31.54\*\* |
| Language usually spoken at home |  |  |  |  |
| Cantonese (ref.) |  |  |  |  |
| Mandarin | 0.0440 | 0.0681 | 8.14\*\* | 6.19\*\* |
| English | −0.2106\* | 0.1067 | 31.97\*\* | 24.76\*\* |
| Others | 0.0881 | 0.0450 | −7.29\*\* | −4.50\*\* |

\*\**p* < 0.01;\**p* < 0.05.

The regression analysis in Table 4 reveals that children aged 13–19 living in private housing were marginally more likely to be in school or to have completed secondary school (Form 5) than children living in public housing, when controlling for their individual and household characteristics. The significance of the relationship fades away after parental characteristics are added to the model. Table 3.Odds ratios of logistic regression models of the likelihood of studying in kindergarten among children (aged between 3 and 5) living in public and private housing (matched sample).

|  | **Model 1** | **Model 2** | **Model 3** |
| --- | --- | --- | --- |
| Public housing (ref.) | Ref. | Ref. | Ref. |
| Private housing | 1.22 (1.02, 1.47)\* | 1.05 (0.92, 1.19) | 0.93 (0.81, 1.07) |
| **Child characteristics** |  |  |  |
| Age | 3.13 (2.76, 3.58)\*\* | 3.87 (3.40, 4.43)\*\* | 4.24 (3.70, 4.90)\*\* |
| **Household characteristics** |  |  |  |
| # of elderly persons aged 65+ |  |  |  |
| 0 (ref.) |  | Ref. | Ref. |
| 2+ |  | 1.04 (0.73, 1.52) | 1.04 (0.72, 1.54) |
| Log household income |  | 1.16 (1.09, 1.23)\*\* | 1.05 (0.97, 1.13) |
| Household size |  | 0.94 (0.89, 0.99)\* | 0.96 (0.91, 1.02) |
| **Paternal characteristics** |  |  |  |
| Years of schooling |  |  | 1.04 (1.01, 1.06)\*\* |
| **Maternal characteristics** |  |  |  |
| Age×age/10 |  |  | 0.99 (0.98, 1.00)\* |
| Years of schooling |  |  | 1.03 (1.00, 1.05)\* |
| Occupation |  |  |  |
| Associate professionals |  |  | 1.53 (1.20, 1.97)\*\* |
| Clerical support workers |  |  | 1.30 (1.06, 1.60)\* |
| Unemployed/economically inactive (ref.) |  |  | Ref. |
| Pseudo R2 | 0.309 | 0.305 | 0.337 |

Note: Child characteristics include age, gender, and place of birth. Household characteristics include household income, household size, gender of the head of household, number of older persons aged 65 and above living in the household, district of residence, and residence change during the past five years. Parental characteristics include ethnicity, place of birth, education level, occupation, and migration-related attributes of both parents.\**p* < 0.05;\*\**p* < 0.01.

Table 5 shows the logistic regression results for local university attendance for youth aged 19–22. The results suggest that private housing tenants are more likely to attend local university than public housing tenants, even adjusting for personal, household, and parental characteristics. There were similar results using NEET as the outcome variable for youth aged 19–22. As shown in Table 6, the likelihood of being NEET was significantly greater for public housing youth. Table 4.Odds ratios of logistic regression models of the likelihood of studying or having completed F5 among children (ages 13 to 19) living in public and private housing (matched sample).

|  | **Model 1** | **Model 2** | **Model 3** |
| --- | --- | --- | --- |
| Public housing (ref.) | Ref. | Ref. | Ref. |
| Private housing | 1.24 (1.15, 1.34)\*\* | 1.24 (1.13, 1.36)\*\* | 1.08 (0.98, 1.19) |
| **Child characteristics** |  |  |  |
| Age | 0.83 (0.81, 0.85)\*\* | 0.82 (0.80, 0.84)\*\* | 0.83 (0.80, 0.85)\*\* |
| Gender (male = 1) | 0.79 (0.73, 0.85)\*\* | 0.80 (0.74, 0.87)\*\* | 0.81 (0.75, 0.88)\*\* |
| Birthplace (Hong Kong = 1) | 1.24 (1.12, 1.37)\*\* | 1.18 (1.07, 1.30)\*\* | 1.05 (0.93, 1.17) |
| Language usually spoken at home |  |  |  |
| Cantonese (ref.) | Ref. | Ref. | Ref. |
| Mandarin | 0.64 (0.45, 0.94)\* | 0.64 (0.44, 0.97)\* | 0.88 (0.51, 1.57) |
| Others | 0.72 (0.61, 0.85)\*\* | 0.81 (0.68, 0.98)\* | 0.95 (0.70, 1.30) |
| **Household characteristics** |  |  |  |
| # of elderly persons aged 65+ |  |  |  |
| 0 (ref.) |  | Ref. | Ref. |
| 1 |  | 0.84 (0.764 0.96)\* | 0.90 (0.77, 1.05) |
| 2+ |  | 1.28 (0.88, 2.00) | 1.82 (1.15, 3.21)\* |
| Log household income |  | 1.07 (1.02, 1.10)\*\* | 0.95 (0.89, 1.01) |
| District of residence |  |  |  |
| Central and Western (ref.) |  | Ref. | Ref. |
| Wong Tai Sin |  | 1.56 (1.01, 2.45)\* | 1.17 (0.79, 1.72) |
| District of residence the same as five years ago |  | 1.37 (1.24, 1.50)\*\* | 1.39 (1.25, 1.53)\*\* |
| **Paternal characteristics** |  |  |  |
| Age |  |  | 1.07 (1.02, 1.13)\* |
| Age×age/10 |  |  | 0.99 (0.99, 1.00)\* |
| Ethnicity (Chinese = 1) |  |  | 0.46 (0.30, 0.72)\*\* |
| Years of schooling |  |  | 1.02 (1.00, 1.03)\*\* |
| Occupation |  |  |  |
| Managers and administrators |  |  | 1.66 (1.32, 2.12)\*\* |
| Associate professionals |  |  | 1.27 (1.07, 1.53)\*\* |
| Clerical support workers |  |  | 1.35 (1.06, 1.75)\* |
| Service and sales workers |  |  | 1.22 (1.04, 1.44)\* |
| Unemployed or economically inactive (ref.) |  |  | Ref. |
| **Maternal characteristics** |  |  |  |
| Age |  |  | 1.12 (1.05, 1.20)\*\* |
| Age×age/10 |  |  | 0.99 (0.98, 0.99)\*\* |
| Ethnicity (Chinese = 1) |  |  | 2.18 (1.55, 3.01)\*\* |
| Years of schooling |  |  | 1.02 (1.01, 1.04)\*\* |
| Occupation |  |  |  |
| Associate Professionals |  |  | 1.23 (1.02, 1.51)\* |
| Unemployed or economically inactive (ref.) |  |  | Ref. |
| Language usually spoken at home |  |  |  |
| Cantonese (ref.) |  |  | Ref. |
| Mandarin |  |  | 0.62 (0.39, 1.02)\* |
| Pseudo R2 | 0.088 | 0.108 | 0.137 |

Note: Independent variables are the same as those in table 3.\**p* < 0.05;\*\**p* < 0.01.Table 5.Odds ratios of logistic regression models of the likelihood of studying for a degree in local university among children (ages 19 to 22) living in public and private housing (matched sample).

|  | **Model 1** | **Model 2** | **Model 3** |
| --- | --- | --- | --- |
| Public housing (ref.) | Ref. | Ref. | Ref. |
| Private housing | 1.27 (1.21, 1.35)\*\* | 1.27 (1.19, 1.35)\*\* | 1.12 (1.04, 1.19)\*\* |
| **Child characteristics** |  |  |  |
| Age | 1.27 (1.24, 1.30)\*\* | 1.28 (1.25, 1.31)\*\* | 1.28 (1.24, 1.32)\*\* |
| Gender (male = 1) | 0.88 (0.84, 0.93)\*\* | 0.87 (0.82, 0.92)\*\* | 0.85 (0.80, 0.90)\*\* |
| Birthplace (Hong Kong = 1) | 1.50 (1.37, 1.64)\*\* | 1.51 (1.37, 1.67)\*\* | 1.54 (1.39, 1.70)\*\* |
| Language usually spoken at home |  |  |  |
| Cantonese (ref.) | Ref. | Ref. | Ref. |
| English | 0.58 (0.39, 0.82)\*\* | 0.73 (0.43, 1.16) | 0.47 (0.24, 0.86)\* |
| Others | 0.56 (0.44, 0.70)\*\* | 0.56 (0.43, 0.72)\*\* | 0.61 (0.45, 0.83)\*\* |
| **Household characteristics** |  |  |  |
| Log household income |  | 1.02 (0.99, 1.05) | 0.96 (0.92, 0.99)\* |
| Household size |  | 0.95 (0.92, 0.98)\*\* | 0.97 (0.94, 1.00) |
| District of residence |  |  |  |
| Central and Western (ref.) |  | Ref. | Ref. |
| Islands |  | 0.84 (0.64, 0.11)\* | 0.91 (0.69, 1.20) |
| District of residence the same as five years ago |  | 1.19 (1.10, 1.29)\*\* | 1.20 (1.11, 1.30)\*\* |
| **Paternal characteristics** |  |  |  |
| Birthplace (Hong Kong = 1) |  |  | 0.89 (0.82, 0.95)\*\* |
| Years of schooling |  |  | 1.04 (1.03, 1.05)\*\* |
| Occupation |  |  |  |
| Unemployed or economically inactive (ref.) |  |  | Ref. |
| Skilled ***Agricultural*** and Fishery Workers & Craft and Related Workers |  |  | 1.11 (1.00, 1.24)\* |
| **Maternal characteristics** |  |  |  |
| Age |  |  | 1.18 (1.08, 1.30)\*\* |
| Age×age/10 |  |  | 0.99 (0.98, 0.99)\*\* |
| Birthplace (Hong Kong = 1) |  |  | 0.92 (0.86, 1.00)\* |
| Years of schooling |  |  | 1.02 (1.01, 1.03)\*\* |
| Occupation |  |  |  |
| Unemployed or economically inactive (ref.) |  |  | Ref. |
| Associate professionals |  |  | 1.14 (1.02, 1.27)\* |
| Service and sales workers |  |  | 0.88 (0.80, 0.98)\* |
| Pseudo R2 | 0.057 | 0.063 | 0.091 |

Note: Independent variables are the same as those in Table 3.\**p* < 0.05;\*\**p* < 0.01.

The relationship between public housing and educational attainment is further validated by examining children's likelihood of being in full-time education. Table 7 demonstrates that, among children aged 5–19, private housing occupants were more likely to be in full-time programs than children in public housing, controlling for child, household, and parental characteristics. Table 6.Odds ratios of logistic regression models of the likelihood of NEET (not in employment, education, or training) among children (ages 19 to 22) living in public and private housing (matched sample).

|  | **Model 1** | **Model 2** | **Model 3** |
| --- | --- | --- | --- |
| Private housing (ref.) | Ref. | Ref. | Ref. |
| Public housing | 1.20 (1.12, 1.27)\*\* | 1.15 (1.07, 1.24)\*\* | 1.14 (1.05, 1.23)\*\* |
| **Child characteristics** |  |  |  |
| Age | 1.03 (1.00, 1.06)\* | 1.04 (1.01, 1.07)\* | 1.05 (1.02, 1.08)\*\* |
| Gender (male = 1) | 1.13 (1.06, 1.21)\*\* | 1.13 (1.06, 1.21)\*\* | 1.12 (1.04, 1.19)\*\* |
| Language usually spoken at home |  |  |  |
| Cantonese (ref.) | Ref. | Ref. | Ref. |
| Others | 1.51 (1.29, 1.76)\*\* | 1.23 (1.02, 1.48)\* | 1.56 (1.18, 2.06)\*\* |
| **Household characteristics** |  |  |  |
| Log household income |  | 0.85 (0.83, 0.88)\*\* | 0.86 (0.83, 0.89)\*\* |
| Household size |  | 1.04 (1.00, 1.08) | 1.05 (1.01, 1.09)\* |
| District of residence the same as five years ago |  | 0.72 (0.66, 0.79)\*\* | 0.71 (0.65, 0.77)\*\* |
| **Paternal characteristics** |  |  |  |
| Years of schooling |  |  | 0.98 (0.97, 0.99)\*\* |
| Occupation |  |  |  |
| Unemployed or economically inactive (ref.) |  |  | Ref. |
| Associate Professionals |  |  | 0.85 (0.74, 0.98)\* |
| **Maternal characteristics** |  |  |  |
| Age |  |  | 0.91 (0.85, 0.97)\*\* |
| Age×age/10 |  |  | 1.01 (1.00, 1.02)\*\* |
| Birthplace (Hong Kong = 1) |  |  | 1.11 (1.01, 1.21)\* |
| Years of schooling |  |  | 0.98 (0.97, 0.99)\*\* |
| Occupation |  |  |  |
| Unemployed or economically inactive (ref.) |  |  | Ref. |
| Skilled ***agricultural*** and fishery workers & craft and related workers |  |  | 1.37 (1.08, 1.72)\*\* |
| Pseudo R2 | 0.011 | 0.033 | 0.052 |

Note: Independent variables are the same as those in Table 3.\**p* < 0.05;\*\**p* < 0.01.

We can provide brief comments on the effects of the control variables on children's educational attainment. Children's gender had a significant effect on their educational achievement. In general, male children were more likely to be in or to have completed their studies in local educational institutions than female children, and female children were more likely to be NEET than male children. Compared to their local-born counterparts, children born outside Hong Kong were more likely to be enrolled in local secondary and tertiary schools and less likely to be NEET. This may reflect Hong Kong's attractiveness as a regional education hub that focuses on preparing students to meet the challenges of a globalized world.

In addition, household mobility is an important variable predicting the educational achievement of children. Children living in households whose district of residence changed within the past five years were more likely to be in or have completed Form 5, to be studying for a degree in local university, and less likely to be NEET. This strong association may indicate that parents in mobile households were keen on education for their children and moved in order to be close to their preferred schools.

Furthermore, parents' years of schooling and occupation showed significant effects on their children's educational attainment. Parents with longer years of schooling tended to be more involved in their children's education, and their children were more likely to study in school or local university, and less likely to be NEET. Fathers' occupation as managers/professionals and/or mothers' occupation as associational professionals will increase the chances of their children to study in or have completed Form 5, study for a degree in local university, and avoid being NEET.

In sum, propensity score matching estimation reveals that public housing residence had a significant negative impact on the educational outcome of youth aged 19–22 in terms of local university attendance and being NEET. The impact of public housing residence on school attendance and completion among children under 19 is positive, but not significant when controlling for individual, household, and parental characteristics. The latter point is understandable given the fact that Hong Kong has offered free 12-year education since the 2008/2009 school year and kindergarten, primary, and secondary education are almost saturated in Hong Kong. The significant difference in post-secondary education and career trajectories between public and private housing children is quite unexpected given that public housing in Hong Kong has undergone frequent improvement in housing design and neighborhood planning, with convenient access to public services and community facilities comparable to private housing communities. How can we explain this negative consequence of public housing residence in Hong Kong, which is widely considered by local citizens as enviable accommodation for lucky people?

This paper proposes an account that is embedded in uneven school quality and public housing residents' restricted school choice.3 In Hong Kong, there are three main types of local school: (1) government schools, which are operated by the government; (2) aided schools, which are fully funded by the government but run by voluntary bodies and religious organizations; and (3) private schools, some of which receive financial assistance from the government but enjoy full discretion over admissions, curriculum design, and tuition. Since private schools often charge high tuition fees that are beyond the budget of ordinary residents, most students in Hong Kong go to government and aided schools, which enrolled 81.44% of primary school students and 82.37% of secondary school students in 2012 (CSDHK, 2013).

The allocation of places in government and aided schools is generally divided into two stages: the discretionary stage and the central allocation stage (EDB, 2013). During the discretionary stage, primary and secondary schools are allowed to reserve a certain portion of their places (no more than 50% for primary schools and 30% for secondary schools) for students who meet the school-specific educational philosophy and admission requirements. The remaining places are used for central allocation through a computerized system. In the centrally allocated stage, 10% are unrestricted school choices and the remaining 90% are based on the placements available in the school district to which children belong. This is done to avoid long commutes.

With the school allocation system encouraging children to study in the nearest school, children living in public housing communities are in a disadvantaged position in terms of access to high-performing schools. This result is partly because of their low degree of housing mobility and partly because of the lack of high-quality schools in their school districts. Once the public housing authority allocates them a public housing unit, people cannot easily transfer to another flat unless they meet special conditions such as increased family size, special medical or social grounds, or major improvement or redevelopment programs implemented by the Housing Authority (HKHA, 2013). Therefore, public housing residents are less mobile than private housing occupants. This is confirmed by the estimation result in Table 8, which shows that the likelihood of changing residential address during the five years up to 2011 was significantly higher among private housing residents than public housing residents. The relative immobility of public housing residents, together with their lower educational background and socio-economic status, restricted the choices of primary and secondary schools available to children living there. As a matter of fact, children living in public housing estates tended to attend community schools close to home and commute to school on foot (Tables 9 and 10). Table 7.Odd ratios of logistic regression models of the likelihood of studying in full-time courses among children (ages 5 to 19) living in public and private housing (matched sample).

|  | **Model 1** | **Model 2** | **Model 3** |
| --- | --- | --- | --- |
| Public housing (ref.) | Ref. | Ref. | Ref. |
| Private housing | 1.34 (1.26, 1.41)\*\* | 1.32 (1.23, 1.41)\*\* | 1.15 (1.07, 1.24)\*\* |
| Pseudo R2 | 0.331 | 0.340 | 0.356 |

Note: Independent variables are the same as those in Table 3.\**p* < 0.05;\*\**p* < 0.01.Table 8.Odd ratios of logistic regression models of the likelihood of having a current residential address that is different from five years prior among households living in public and private housing (matched sample).

|  | **Model 1** | **Model 2** | **Model 3** |
| --- | --- | --- | --- |
| Public housing (ref.) | Ref. | Ref. | Ref. |
| Private housing | 2.02 (1.97, 2.08)\*\* | 1.92 (1.86, 1.98)\*\* | 1.50 (1.45, 1.55)\*\* |
| # of school-age children | 1.06 (1.05, 1.08)\*\* | 1.06 (1.04, 1.08)\*\* | 0.96 (0.94, 0.98)\*\* |
| Public housing\* # of school-age children | 0.93 (0.91, 0.95)\*\* | 0.94 (0.92, 0.97)\*\* | 1.03 (1.00, 1.05)\* |
| Pseudo R2 | 0.049 | 0.080 | 0.178 |

Note: Model 2 controls for household characteristics (number of older persons, household income, household size, gender of the head of household, and district of residence). Model 3 controls for household, head of household, and spouse of head of household characteristics (age, ethnicity, place of birth, years of schooling, employment status, and language usually used at home).\**p* < 0.05;\*\**p* < 0.01.Table 9.Odd ratios of logistic regression models of the likelihood of attending local community school among children (between ages 5 and 19) living in public and private housing (matched sample).

|  | **Model 1** | **Model 2** | **Model 3** |
| --- | --- | --- | --- |
| Private housing (ref.) | Ref. | Ref. | Ref. |
| Public housing | 1.59 (1.55, 1.63)\*\* | 1.52 (1.48, 1.57)\*\* | 1.31 (1.27, 1.35)\*\* |
| Pseudo R2 | 0.080 | 0.120 | 0.141 |

Note: Variables controlled in model 1-3 are the same as those in Table 7.\**p* < 0.05;\*\**p* < 0.01.

Limited school choices interacted with the spatial unevenness of school quality to shape the accessibility of high-performing schools to public housing children. Although there is no official ***data*** on the quality and performance of primary and secondary schools in Hong Kong, some scattered evidence suggests that they differ greatly across school districts. Table 11 lists the spatial distribution of 22 grant schools in Hong Kong, which are commonly understood as elite secondary schools as a result of their long histories of development in the city. It can be seen in the table that close to 55% of these elite public schools are located in central and western district and Wai Chai district on Hong Kong Island. They accommodated no more than 10% of PRH residents of the city. The quality of a secondary school can also be identified by an examination of the number of high-performing students admitted in previous years. During the central allocation stage of secondary school places allocation system, all primary school graduates are classified evenly into three bands from high (band 1) to low (band 3) based on their academic scores. Secondary schools that admit a disproportionately high share of band 1 students are normally considered to be of high quality. While the educational bureau in Hong Kong does not encourage the sole use of this indicator to evaluate school quality, it is widely used by local parents as an important reference for their children's school choice. Table 11 shows the number of band 1 schools in Hong Kong across school networks based on the ***data*** from schoolland.hk, a local educational information platform providing consulting services for school choice in the city. The ***data*** represent a rough estimation and summation of the general admission performance of local secondary schools. It nevertheless provides a useful empirical basis for examining the spatial heterogeneity of public housing quality in Hong Kong. It is observable that central and western, Wan Chai, Eastern, Kowloon City districts are characterized by a share of band 1 schools well above the city average. These school districts, however, have no significant PRH presence in their housing stocks. There appears to be a considerable spatial mismatch between public housing children living mainly in the new towns of new territory and attending local community schools on one hand and the spatial concentration of high-quality schools in Hong Kong Island and Kowloon City on the other. Such limited access to high-performing schools logically leads to poorer educational attainment among children living in public housing. Table 10.Odd ratios of logistic regression models of the likelihood of commuting to school on foot among children (ages 5 to 19) living in public and private housing (matched sample).

|  | **Model 1** | **Model 2** | **Model 3** |
| --- | --- | --- | --- |
| Private housing (ref.) | Ref. | Ref. | Ref. |
| Public housing | 1.57 (1.53, 1.61)\*\* | 1.55 (1.50, 1.60)\*\* | 1.34 (1.30, 1.39)\*\* |
| Pseudo R2 | 0.072 | 0.099 | 0.117 |

Note: Variables controlled in model 2 and 3 are the same as those in Table 7.\**p* < 0.05;\*\**p* < 0.01.Table 11.Spatial distribution of Grant and Band 1 Schools in Hong Kong by School district.

| **School district** | **Number of Grant schools** | **Share in city total (%)** | **Number of Band 1 Schools** | **Share in school district total (%)** |
| --- | --- | --- | --- | --- |
| Central and Western | 7 | 31.82 | 6 | 50.00 |
| Wan Chai | 5 | 22.73 | 7 | 46.67 |
| Eastern | 1 | 4.55 | 12 | 37.50 |
| Southern | 1 | 4.55 | 2 | 11.11 |
| YauTsimMong | 3 | 13.64 | 7 | 41.18 |
| Sham Shui Po | 1 | 4.55 | 7 | 25.93 |
| Kowloon City | 4 | 18.18 | 13 | 38.24 |
| Wong Tai Sin |  |  | 5 | 20.00 |
| Kwun Tong |  |  | 9 | 26.47 |
| Sai Kung |  |  | 5 | 18.52 |
| Sha Tin |  |  | 14 | 31.11 |
| Tai Po |  |  | 6 | 28.57 |
| North |  |  | 7 | 35.00 |
| Yuen Long |  |  | 9 | 23.08 |
| TuenMun |  |  | 10 | 26.32 |
| Tsuen Wan |  |  | 4 | 30.77 |
| Kwai Tsing |  |  | 9 | 29.03 |
| Islands |  |  | 1 | 9.09 |
| Total | 22 | 100.00 | 133 | 28.98 |

Source: [*http://www.schooland.hk/ss*](http://www.schooland.hk/ss)/

**Discussion and conclusions**

The relationship between public housing and children's educational attainment has in recent years attracted growing attention from urban scholars and policymakers. Most studies on this subject have been based on the experiences of Western cities characterized by a diminishing and residualized public housing sector. The mechanisms identified involve several key dimensions of children's housing circumstances that are associated with their educational performance. However, it remains unknown whether the same mechanisms can be applied to make sense of the situation in other regions with different physical, social, and institutional contexts of public housing development.

This paper assesses the impact of public housing residence on the educational achievements of children in Hong Kong, where an expanding and resilient public housing sector is arguably posited to be the facilitating agent of progressive social change. Based on the 5% sample of the 2011 Hong Kong Population ***Census***, propensity score matching estimation identifies a negative association between public housing occupancy and the educational attainment of children aged 19–22 in terms of local university attendance and NEET status, even controlling for individual, household, and parental characteristics. While it is the poor living and neighborhood environment characterizing public housing communities in the west which adversely affect children's academic performance, the poorer educational achievement of public housing children in Hong Kong is more related to their restricted access to high-performing schools given that the physical environment and neighborhood community of PRH in Hong Kong are planned and designed with high standards comparable to those in the private housing market. The public housing allocation system's inflexible mechanism of flat transfers and the spatial mismatch between public housing estates and high-quality public schools appear to be important factors responsible for the negative effect of public housing residence on children's educational attainment.

This case study challenges the perceived notion about the unambiguously positive impact of public housing scheme in Hong Kong. While public housing in Hong Kong has been commonly praised by academic scholars and the general public as the facilitating agent of progressive economic and social changes in terms of entrepreneurship, social capital formation, poverty reduction and educational equality, the empirical finding presented in this article serves as a sobering reminder that living in public housing in Hong Kong is still a disadvantage for the educational achievement of children therein, especially during the period of their post-secondary study. Even though public housing has allowed some low-income families in Hong Kong to devote more family resources to educating their children through heavy rent subsidy, a lack of housing mobility and consequently restricted access to high-performing secondary schools stand out as a non-negligible factor preventing public housing children from achieving educational performance comparable to their private housing counterparts.

This study has also important theoretical and practical implications. Theoretically, it uncovers different mechanisms underlying seemingly identical pattern between public housing residence and children's education in different urban contexts. While the negative association between public housing occupancy and the educational attainment of children in Hong Kong is quite similar to the pattern observed in many western cities, the causal mechanism leading to such a relationship is different from one another. The comparatively inferior performance of public housing children in the west is often related to the deteriorated physical structures and high-poverty, segregated neighborhoods of public housing projects. In contrast, the poorer educational achievement of children living in public housing estates in Hong Kong is more attributable to their disadvantaged access to high-quality educational resources. The case study therefore points to the need for a place-specific and contextualized analysis of the variegated mechanisms linking public housing with children's education.

In practical terms, this study echoes the recent call of western policy analysts to pay more attention to the characteristics of schools serving students who live in public housing (Cunningham and MacDonald, 2012; Schwartz et al., 2010) and suggests a closer integration of public housing and public school policies in Hong Kong, which have until recently been treated separately. On the one hand, Hong Kong's public housing policy was initially formulated as an attempt to redistribute population away from congested urban areas. Later, attention was paid to the quality standards of public housing projects in terms of architectural layout, living conditions, and commercial, social, and recreational facilities. However, little effort was devoted to ensuring accessibility to high-quality education for low-income families living in public housing estates. On the other hand, the planning and development of public schools in Hong Kong have focused on having an adequate supply of places in different school districts to reduce residents' commuting time. Rarely has attention been given to the spatial and institutional barriers to accessing high-performing schools encountered by low-income children living in public housing. This separation between two related policy concerns is untenable in the long run given the increasing recognition that “housing policy is school policy” (Schwartz et al., 2010).

In a review paper, Cunningham and MacDonald (2012) pinpointed some recommendations to integrate housing and school policy, such as prioritizing placements for public housing children in neighborhoods with high-performing schools, improving housing, and attracting middle-income families to neighborhoods with low-performing schools with the goal of improving school quality over the long term, and increasing the effectiveness of housing voucher schemes by including additional requirements to ensure that children in recipient households switch to high-performing schools. The extent to which these policy initiatives can be applied to Hong Kong is an important question in need of further research.

The findings of this study have to be treated with caution due to multiple limitations. First, since propensity score matching method is based on the characteristics accounted for in the propensity score estimation model, it still cannot be completely free from the omitted variable biases. Hidden bias can remain if households in PRH have some unobserved individual- or family-level characteristics that may contribute to their propensity of being selected into PRH and have negative impact on the educational attainment of children living there. Under this scenario, perhaps those unobserved factors, rather than public housing residence itself, predispose children to negative outcome in educational performance. While this limitation of public housing and neighborhood selection bias always exists and does not necessarily affect the results of this paper, similar studies with experimental or longitudinal research design can be done in the future to test the robustness of our results. Second, as reviewed in the previous section, housing is a bundle made up of many different dimensions, such as housing stability, affordability, quality, and neighborhood community and so on, that may affect children's educational attainment in different ways. Owing to ***data*** availability, this study does not control for any specific features of housing flats and neighborhoods. Therefore, the estimated effect of public housing residence reported here may involve both housing and the surrounding neighborhood. In order to facilitate targeted policy making, more research is needed to disentangle the complex bundle of attributes inherent in public housing residence, and to measure the relative magnitude of the impact of each attribute on children's educational outcomes.

**Notes**

1.It should be acknowledged that there is an inherent bias in the statistical exercise based on this dataset. Many youths aged 19–22 were no longer living with their parents at the time of ***census*** and therefore were not included for evaluating the impact of public housing residence on their educational outcomes. Moreover, it is likely that children move out at different rates depending on whether they live in public housing or not. As a result, the sample of the 2011 population ***census*** is biased by attrition. The interpretation of the results derived from this sample should take into account such bias. We thank an anonymous reviewer for pointing out this limitation.; 2.A notable example following this analytical strategy was the study of the impact of public rental housing on unemployment in Hong Kong by Monkkonen (2011). Focusing on a topic related to this study, Monkkonen (2011) developed a simultaneous probit model with instrument variables that describe the number, age, and gender composition of children.; 3.The evidence provided below for this explanation is more suggestive than conclusive. A rigorous way to test this account entails the collection of systematic ***data*** on the quality of schools attended by children living in public housing. Unfortunately, such indicator is not available in the ***census*** ***data*** utilized here. Nevertheless, to quantify the impact of school quality on the educational performance of children living in public housing could be a worthwhile topic for future investigation.

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[***A new co-operative revolution in South Africa? Reflections on the outcomes of state support in the Free State Province***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:6BNK-C111-DY41-746X-00000-00&context=1516831)

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**ABSTRACT**

There has been growing interest in the role and potential which co-operatives can play in terms of economic and community development in the Global South as alternatives to more conventional models of business organisation. One country which has been particularly proactive in this regard is South Africa, where co-operatives feature prominently in national and provincial level development strategies and support. This paper overviews key themes in the literature before proceeding to a case study of the effectiveness of state support for co-operatives in the Free State Province of South Africa. Findings show that the well-intentioned objectives of state interventions are not being realised due to poor business planning, lack of training, poor market links and the seeming prioritisation of political over economic considerations.

**FULL TEXT**

**Introduction**

In the slipstream of the 2007–2009 financial crisis with state bailouts for financial giants (e.g. Royal Bank of Scotland & Lloyds TSB in the UK and Wells Fargo, Morgan Stanley, Citigroup and Bank of America in the USA), mainstream capitalism has come under fire from a variety of quarters and resentment has been manifested in a range of responses. These include calls for a new approach to doing business (Hutton, 2015) and in the view of the prominent economist Mayer (2013) this would mean that controlling ownership should be in the hands of people who can ensure that directors discharge their responsibilities. In addition, ‘social entrepreneurship (has) become an increasingly popular topic in some academic environments’ (Vasi, 2011). Related to these emerging themes and to parallel systemic changes, globally there has been what some regard as a co-operative renaissance as a result of ‘the rise of global markets and fair trade response, democratization and the resurgence of civil society, and the demise of socialism’ (Khumalo, 2014: 63). Worldwide it is estimated that some 800 million people are involved in co-operatives (DTI, 2006 in Stenberg and Grundling (2013)).

Arguments in favour of support for co-operatives align well with Gibson-Graham's ‘politics of possibility’ arguments (in Cornwell (2011)), which seek the pursuit of more diverse economies in which ‘noncapitalist transactions, labour and enterprises are differentiated and located alongside (rather than within) capitalism’ (Cornwell, 2011: 4). Non-capitalist and alternative forms of capitalist labour, transactions and enterprise are seen as being opened up by the pursuit of collective ownership and through the creation of ‘spaces of possibility’. In this regard, co-operatives have a multi-purpose mission – namely as a business which combines a social mission with economic goals and as a movement to democratise workplaces and employment (Nonkovic, 2012). Key ingredients for success of co-operatives, according to Birchall (2013) are direct member control, reciprocity and the pursuit of alternate goals to profit, albeit it is within an operational business context.

In the case of South Africa, the government has ‘recognised cooperatives as an important avenue for collective advancement of sustainable livelihoods at the community level and encouraged cooperative development to simultaneously grow entrepreneurship, innovation and community development’ (in Steynberg and Grundling (2013: 2)). It is argued that co-operatives have a key role to play in the country in terms of economic growth, job creation and poverty reduction, but their potential has been compromised by how they are organised (Twalo, 2012). Co-operatives feature prominently in the development agenda in South Africa and the government in August 2005 signed into law a new Co-operatives Act (no 14 of 2005) which identified a major role for co-operatives in promoting economic and social development in the country ‘in particular by creating employment, generating income and facilitating, broad-based black economic empowerment and the eradication of poverty’ (in Ortmann and King (2007a: 18)). The net result of direct encouragement of co-operatives in recent years has been ‘a proliferation of state-led community development initiatives tasked to form community-based cooperatives’ (Westoby, 2014: 827).

Despite this optimism about the potential of co-operatives research reports on the achievements of South African co-operatives have indicated that, at best, their performance yield ‘mixed results’ with little statistical evidence of their ability to create significant income or employment. Of 22,030 co-operatives registered in South Africa in 2010 only 2644 or 12% were still operational; despite this, the number of registered co-operatives had increased to 54,471 in 2012 largely as a result of direct state encouragement and not spontaneous member-led action (Steynberg and Grundling, 2013). It has been argued that ‘it is possibly either a misunderstanding or rather a misalignment between the expectations of and from co-operatives that has resulted in some poor practices and unrealistic expectations’ (Cohen, 2011: 1). On the positive side, benefits to members such as empowerment, access to finances and informal learning are repeatedly alluded to in the literature. The aims of this paper are to collate findings about the ‘mixed results’ achieved in South Africa and to assess the benefits, problems and sustainability of the co-operative system, with particular reference to the Free State Province where significant state resources have gone into co-operative formation and their perceived economic development and employment generating potential.

**Co-operatives in the literature: Key features and types**

Co-operatives exist as a very distinctive form of business arrangement based not on individual but rather collective ownership, control and benefit. Ownership and accountability tend to be horizontally and group orientated rather than hierarchical and individualistic. Principles of group as opposed to individual gain and a desire for democratisation of the workplace tend to underlie their structure and operation and they exist in and compete with the market economy as a distinctively different form of business organisation. Profits are normally distributed amongst members and not paid to shareholders and operationally decisions regarding purchases, sales and processing are often undertaken collectively (Abor and Quartey, 2010; Borda-Rodriguez and Vicari, 2014; Wanyanma et al., 2008).

Ortmann and King (2007a, 2007b) detail the International Cooperative Alliance's definition of co-operatives which requires the presence and operation of seven key factors: ‘voluntary and open membership; democratic member control; and member economic participation; … provision of education training and information; autonomy and independence; co-operation among co-operatives and concern for the community’. It is also important to note that there are different, well-recognised types of co-operatives. According to Ortmann and King (2007a) these include: consumer, producer and worker and services co-operatives. A report Hope in Action Co-operatives in South Africa, released in March 2002, and based on a study by the National Co-operatives Association of South Africa (Philip, 2003), focussed on the distinction between worker co-operatives and user co-operatives (primarily in the areas of finance, housing, ***agriculture***). This ***survey*** indicated that 90% of South Africa's co-operatives were worker co-operatives driven by the individual member participants. This paper noted a low level of interest in user co-operatives in South Africa due to the strong desire to focus on job creation for the large numbers of unemployed people, rather than to focus on enhancing the economic viability of consumers.

The above study also indicated that reported member income in co-operatives is very low, with 40% of responding members reporting receiving no income from their co-operative, while 36% of members averaged an income of only R 133 per month (in 2003) (£1 = apprx. SA Rand (R) 18 in 2015). Other common forms of user co-operatives in South Africa include housing and social housing co-operatives, with there being minimal evidence of consumer co-operatives.

Barton (2000, in Ortmann and King (2007a)) noted that although the most successful co-operatives, in terms of job creation, existed in North America and Europe, Schwettmann (1997 in Wanyama et al. (2008)) in an International Labour Organization study in 15 African countries, is of the opinion that the number of jobs created from co-operatives may be under-reported. This study established that the majority of jobs created from co-operatives were in the form of self-employment, but that this failed to take into account casual and seasonal labour, and spill-over jobs in areas such as packaging or business services which also need to be taken into account. Attention now turns to look at the benefits and costs associated with the co-operative model.

**Benefits**

Within the literature a range of benefits are associated with the operation of successful co-operatives. While income is a key outcome, equally important is worker ownership, control and empowerment, democratisation of the workplace and effort to maximise local development potential (Abor and Quartey, 2010; Borda-Rodriguez and Vicari, 2014; Wanyanma et al., 2008). Being a member of a co-operative can help assure better access to finance (Abor and Quartey, 2010) which might not be available to individuals (Borda-Rodriguez and Vicari, 2014). In addition, individual risk is transformed into collective risk, although it must also be recognised that the reverse also holds. A potential positive factor is that members could gain considerable informal learning from being part of a collective, as well as often having access to formal training. Of particular benefit is the development of evaluation skills among member to assess the viability of their enterprises and the potential for investment (Wanyama et al., 2008). Social benefits included access to education and health services, including help if members become ill. Wanyama et al. (2008) specifically noted that co-operative members in Africa were able to become beneficiaries of funeral funds in places where HIV-affected families were previously excluded. Increased food security in ***agricultural*** co-operatives is seen as critical, especially through the establishment of grain banks. In the case of South Africa with its persistently high levels of poverty, low educational attainment and limited job prospects for people living in the more economically marginalised areas, this reality has promoted the government to give very serious consideration to the above considerations and it has actively promoted the co-operative model as one which can empower communities and provide for an alternative form of participation to the conventional business model in the mainstream economy (Steynberg and Grundling, 2013).

**Challenges**

Despite the apparent advantages which the co-operative model can offer as a tool to achieve community empowerment, compared with more traditional forms of business organisation, it is apparent that a range of negative issues are also associated with co-operatives. Various authors such as Borda-Rodriguez and Vicari (2014) have indicated that there have been ‘mixed results’ globally related to their performance. These include the reality that they are often under-capitalised, ownership is ill-defined and they can experience varied levels of participation and engagement by members (Nonkovic, 2012).

Some of the primary challenges which co-operatives face revolve around the issue of access to finance. While having access to finance is a key advantage for successful co-operatives, overall, the financial resources of co-operatives are generally weak and they often fail to generate significant funds from their members (Borda-Rodriguez and Vicari, 2014). Related to this, members are often not property owners which normally denies them access to collateral to generate investment funds (Ortmann and King, 2007b), leading to under-capitalisation. Other concerns include having member disloyalty (Borda-Rodriguez and Vicari, 2014), the need for ready cash by members and the inability to make repayments (Ortmann and King, 2007b). To succeed Gurmessa and Ndinda (2014) argue that there is a need for entrepreneurs to be well prepared, to have good projects, access to banks and bank professionals able to support and handle co-operatives, and having access to entrepreneurial advice. There is a parallel need to identify special funding sources such as community investment funds and, if possible, incentives and special tax concessions. In addition to limited access to finance, co-operatives often lack access to property – land and buildings, and they often operate in areas with weak communication and infrastructure and limited transport access (Philip, 2003).

In terms of market access and competition, additional challenges can be identified. Zonin (2014) notes that the large retailers set quality standards and manage product flows which make selling products to local supermarkets a challenge for co-operatives. In parallel Philip (2003: 20) noted there is a challenge with respect to the focus of co-operatives selling to local markets, which are often very ‘brand and price sensitive’, allowing only limited space for new competitors, particularly those inexperienced in responding to market volatility.

Although employment creation is desirable and often a motivation for funders, Philip (2003) noted that concerns can be raised with ‘over-employment’ which exceeds the potential financial returns which the co-operative can generate. In addition, paying equal payments/wages to members who have contributed differentially to the operation of the co-operative has raised questions over equity.

Another theme where challenges have been identified relates to issues of governance and human capital. The literature indicates that co-operatives can be hindered by a range of negative issues including leadership challenges in the organisation and in-fighting within co-operatives, which often stems from having weak and/or authoritative management systems (Ortmann and King, 2007b). Hartley and Johnston (2014), in their paper on youth co-operatives, established that corruption and elite capture have negative effects on co-operatives, as do the effects of externally imposed structural adjustment requirements, social exclusion on the basis of gender, poor education and limited access to collateral. Associated challenges include the frequent exclusion of women from co-operatives, and a lack of education and skills amongst members (Mandipaka, 2014). Low levels of member literacy and poor accounting skills commonly lead to a dependency on support agencies for technical help and an inability to operate independently.

Government support, though normally well intentioned, can be problematic in its own way. Borda-Rodriguez and Vicari (2014) noted that in South Africa there appears to be overlapping and confusing support for co-operatives among government agencies, and that there is a need to harmonise all government policies and actions around co-operatives. Key in this regard is the need for support to establish links between various parties including other co-operatives, finance sources, NGOs, government bodies and the world market. There is a parallel need to retrain government extension officers and incorporate advisors from successful co-operatives, marketing specialists and supermarkets in support programmes (Gurmessa and Ndinda, 2014).

The preceding challenges and benefits are important to note in the assessment which follows, as these considerations help determine the strengths and weaknesses of what has been attempted in South Africa.

**Co-operatives in South Africa**

**Operationalising state support**

The South African government overtly identifies with the concept of the ‘development state’ and has charged itself with the responsibility to address deep-seated economic marginalisation and poverty, including through actions such as public works programmes, support for small businesses and the informal sector and more recent through providing direct support for the formation of co-operatives (Khumalo, 2014; National Planning Commission, 2011). The prevailing government discourse in South Africa is that co-operatives have a key role to play in terms of development through their potential for job creation, particularly in terms of the crafts, ***agriculture***, retail, manufacturing, tourism and housing sectors, and it is believed that they can help to employ the vulnerable (Khumalo, 2014). State support includes the passage of The Cooperatives Act (2005), the Cooperative Development Policy (2004) and the establishment of a Cooperative Banks Association (2007). In 2012 national government's Department of Trade and Industry (DTI) announced plans to establish a Cooperatives Development Agency and an Integrated Strategy on the Promotion and Development of Cooperatives (Westoby, 2014). Direct financial and advisory government support is channelled through the DTI, the Small Enterprise Development Agency, the Umsombomvu Youth Fund, the National Development Agency, the Micro ***Agricultural*** Finance Scheme and the Micro-Finance Apex Fund (Steynberg and Grundling, 2013). In addition, the government has established the National Community Development Worker Programme and the Community Practitioner Programme which employ 6000 community workers to support co-operatives (Westoby, 2014).

Participants in Westoby's (2014) study explained that each Community Development Worker has been tasked to help establish 12 community co-operatives p.a. employing at least 20 people each and Westoby (2014: 834) argued that ‘this is an appealing prospect to a government needing to create jobs among populations’. Outcomes of the programme report of successful registration but also of the collapse of many co-operatives, which reflects on how the ‘political and instrumental needs of the state (have) led to confusion and dilemmas about how to catalyse cooperative formation’ (Westoby, 2014: 834) and the associated risks of establishing ‘collectives from above’ not from below. In the Gauteng Province it was established that 54.2% of co-operatives were set up by the state and only 24.1% were self-initiated (Twalo, 2012). As a direct result it is argued that in government actions to ‘launch small scale cooperatives amongst impoverished communities … few of these attempts have been successful and many resulted in top down management styles, a lack of accountability, financial losses and loss of direction’ (Steynberg and Grundling, 2013: 2).

Challenges noted with the government support process include a lack of attention to process and a lack of training of workers which undermines the potential for success. Key in this regard according to Westoby (2014: 836) is the conceptualisation of co-operatives as a job creation strategy and not as part of a process of the social economy which creates a ‘contradiction between the imperatives of the state – to deliver and create livelihoods – versus the realities on the ground of social practise’ (Westoby, 2014: 836).

Previous studies indicate that the interventions of the state have failed to create a scenario of sustainable development. In 2010, as noted above, it was established that of the 31,898 formal registered co-operatives, 88% had failed, the majority of failures being in the poorest provinces with the greatest developmental needs (Satgar and Williams, 2011 in Westoby (2014: 828)). Authors argue that co-operatives in South Africa have been undermined by ‘the lack of an active cooperative movement and faulty state support’ and they face a ‘high attrition rate, leadership and management challenges, interference by government officials, and lack of stability’ (Khumalo, 2014: 61). Challenges such as limited skills, poor quality services and products, over-dependence on the provision of inputs by the state, limited access to markets and business infrastructure and poor government procurement from co-operatives have all hamper their effectiveness (Khumalo, 2014).

In recognition of the challenges which are faced, the Deputy Minister of Trade and Industry noted in 2012 that ‘although the number of cooperatives in the country has increased significantly in the past ten years, they have not done much to improve the economic and social conditions of their members and surrounding communities’ (in Khumalo (2014: 69)). ‘The increasing gap between the rich and the poor as well as the soaring poverty and unemployment levels clearly suggests that cooperatives have not succeeded in closing the divide’ (Twalo, 2012: 6).

Clear challenges exist with the South African government's understanding of co-operatives and how to effectively support them. Key to any future interventions should be the development of ‘social capital’ through education (Steynberg and Grundling, 2013). Westoby (2014: 837) argues that community-based education and training of co-operative members and support agents would ‘pay more long-term dividends than attempting to fast-track new cooperative formation as a job creation strategy’ (Westoby, 2014: 837). In parallel, an enabling environment which can encourage a strong co-operative movement is seen as essential as is the need to supply adequate funding, but to avoid a ‘handout syndrome’ in so doing (Khumalo, 2014).

Many of the challenges identified above are directly associated with concerns over the sustainability of co-operatives, an issue which is discussed by numerous authors, including the possible mismatch between why co-operatives are established and how they operate (Borda-Rodrgiuez and Vicari, 2014; Philip, 2003). Soberingly Neven et al. (in Wanyama et al. (2008: 360)) based on a study in Kenya, established that ‘cooperatives are easy to form but difficult to maintain’. It is against the backdrop of the identified notion of state intervention and the identification of co-operatives as a vehicle to promote development the nature and outcome of state intervention in one province are now assessed.

**Support for co-operatives in the Free State Province and nationally in South Africa**

The focus of the rest of the article is based on secondary and primary research undertaken in the Free State Province of South Africa as part of an internationally funded research study of small business development. The Free State Province has a population of 2,745,590 and the third highest official unemployment rate (31.6% of the potentially employable population) of the nine provinces in the country (Stats SA, 2012). Within this context the provincial government wishes to enhance employment and co-operatives are high on the priority list of economic empowerment and job creation interventions. Drawing on national policy thinking but also the limited success achieved in job creation over the last 20 years, the provincial government, for both political and developmental reasons, is anxious to promote job creation in the more marginalised area, with co-operatives increasingly been seen as an alternate approach to achieve these goals, which relies less directly on conventional market forces. The commitment to the promotion of co-operatives is evidenced from a range of statements and interventions. Promotion of co-operatives is a constant theme in the State of the Province Addresses to the Provincial Legislature by Premier Ace Magashule. On 24 February 2015 he stated: we are committed to ensuring that we utilize the purchasing power of government in a much more strategic and efficient manner. Our procurement strategy will increasingly focus on procuring through … co-operatives and youth- and women-owned enterprises. Thirty percent of procurement will be allocated to rural and township enterprises and cooperatives. (Magashule, 2015)Earlier, in 2012 in his opening address of the Legislature, Magashule stated his commitment to co-operatives and that many could benefit from state contracts, ‘women cooperatives will benefit from school nutrition programmes’ (Magashule, 2012).

In terms of applied support, in the 2010/11 Budget Vote on the provincial Department of Trade, Tourism and Environmental Affairs (DETEA) the then Member of the Executive Committee Mxolisi Dukwana stated that R 7.32 million has been set aside to establish a total of 30 additional co-operatives throughout the Free State from which 166 jobs would materialise ([*www.gov.za*](http://www.gov.za), 7 June 2010). Dukwana, in his 2011 Budget Vote he said that the department had ‘identified cooperatives as the way to help our people out of poverty’ (Dukwana, 2011). In 2012 Dukwana's successor said: We have designed a number of Sectoral Development Initiatives (SDIs) to activate growth in the province. All these SDIs involve Cooperatives that are and will be specifically established to pursue a specific sector. These SMMEs and Cooperatives will be nurtured to sustainability by a Market Champion whose role it is to ensure that orders from prospective customers are secured and delivered to specification. … The model is further strengthened through the involvement of an independent financial manager. (Qabathe, 2012)At this point in time there is no evidence that such support was provided or if provided, effective.

This commitment by the Free State Government should be seen in the context of a national thrust for co-operative development since the DTI decided in 2003 to promote co-operatives. This thrust gained momentum after President Zuma assumed power. Defined national-level support includes the National Community Development Programme and the DTI's Co-operative Incentive Scheme (CIS) (DTI, 2010). The national Department of Co-operative Governance and Traditional Affairs (CoGTA) also initiated a programme to create ward-based co-operatives and to appoint an economic champion covering each and every ward in South Africa (CoGTA, 2010).

From 2010 the CIS offered a grant (up to a maximum of R 300,000) of 90% of the financial costs to approved co-operatives with the latter only needing to contribute 10%. The scheme was structured in a format that enabled co-operatives to provide their 10% contribution ‘through existing assets, cash on hand or skills for the successful execution of the project’ (DTI, 2010: 9). In discussions with Phololo Marolo of CIS, DTI, in February 2015 he confirmed that the current level of the grant had been raised to R 350,000 (Marolo, 2015, personal communication).

**Methodology**

Given the significant attention paid to the establishment and support of co-operatives by the Free State provincial government, as will be detailed in the next section, a study of both policy and practise in this province provides insight into the nature and outcomes of current co-operative support in the country.

The study had two primary foci, first a desktop ***survey*** of the available, but often conflicting ***data*** sets on the number and types of registered co-operatives in the province. Sources of ***data*** were ***data*** sets sourced from the Free State office of CoGTA, the Free State Treasury, the provincial Department of ***Agriculture*** and the provincial DETEA. These ***data*** sets were reconciled with a list of co-operatives in the Free State registered at the Companies and Intellectual Property Commission (CIPC). Duplications and co-operatives without a CIPC registration number were removed. Information available in these ***data*** sets provided the enterprise name, the registration number, physical address, description of economic activity, telephone numbers (if available), email address (if available) and whether it was a primary or a secondary sector co-operative. The second phase of the research consisted of 220 telephonic interviews undertaken with an approximate 5% sample of registered co-operatives in the province. The funders requested that the interviews should focus on co-operatives in the Thabo Mofutsanyana District, but the target of 220 could not be reached in that district, since of the of the 1269 registered co-operatives in that district only 388 have telephone numbers. From these only 131 interviews could be conducted: in 257 cases the telephone numbers were no longer operational, belonged to someone who had nothing to do with the co-operative or to a person that indicated that the co-operative never got going and that he/she was not in a position to provide information. The other 79 interviews were randomly spread over the remainder of the province as a result. A telephonic ***survey***, though not being an ideal form of ***data*** acquisition, given the reality that only some 30% of co-operatives had phone numbers, was the only research option available due to the time and budget constraints. As such the results, while the findings indicate broad trends in the co-operative sector, they may have drawbacks in terms of their representivity. On the other hand, enterprises without a mobile or telephone are unlikely to be operational and viable in the 21st century. ***Data*** analysis was undertaken through the use of descriptive statistical analysis and the coding of interview responses.

**Findings**

**Establishment, location and types of co-operatives**

After analysing and comparing the various ***data*** sets available, it was established that in 2013 there were 4249 registered co-operatives in the Free State Province. In line with the massive drive by both the national and the provincial government there has been a clear surge in the number of registered co-operatives in the province which increased from 423 in 2009 to 4249 in 2013 (see Table 1). This expansion clearly overlaps with the encouragement given by the Minister of CoGTA Sicela Shiceka in 2010 to establish ward-based co-operatives within each municipality ‘to ensure that the whole community participates and benefits’ (CoGTA, 2010). It does raise the question of the viability of the enterprises and whether they were established through voluntary association or through government encouragement, with the lure of a government establishment grant. Performance targets which government Community Development Workers have to achieve are clearly a key issue in this process (Westoby, 2014). Table 1.Number of registered co-operatives according to year of registration and total at end of each year in the Free State, 1970–2013.

| **Year** | **Number of co-operatives registered** | **Cumulative number of co-operatives** |
| --- | --- | --- |
| 1970 | 1 | Unknown |
| 1995 | 1 | Unknown |
| 1999 | 1 | Unknown |
| 2000 | 2 | Unknown |
| 2001 | 3 | 8 |
| 2002 | 0 | 8 |
| 2003 | 0 | 8 |
| 2004 | 0 | 8 |
| 2005 | 4 | 12 |
| 2006 | 11 | 23 |
| 2007 | 30 | 53 |
| 2008 | 133 | 186 |
| 2009 | 237 | 423 |
| 2010 | 551 | 974 |
| 2011 | 529 | 1503 |
| 2012 | 647 | 2150 |
| 2013 | 2099 | 4249 |

Table 2 and Figure 1 indicate the number of co-operatives in the province by the key economic sectors. It also indicates the spatial distribution of these enterprises across the province, according to whether the co-operatives were operating in the province's primary urban centre, the city of Bloemfontein (in the Mangaung Metropolitan municipality) or in one of the four district municipalities which the province is administered through. The most striking features from these findings include the large number of farming co-operatives (958 or 23%), and the 1393 (33%) multi-purpose co-operatives, which may hint at a lack of agreed economic focus for these enterprises. The importance of manufacturing (7%), trade (6%) and tourism/hospitality (9%) is noteworthy, with the latter probably reflecting perceived market opportunities in terms of small-scale trading enterprise in what are often small-scale catering businesses. Forty-five per cent of co-operatives occur in four single sector categories: farming, manufacturing, tourism and hospitality, and trade. If one adds to this total the category of multi-purpose, which may well have a predominant focus in one of these four sectors, a total of 88% is arrived at, leaving only 12% of firms active in the remaining 15 sectors used in the ***survey***. While the farming focus is understandable in a province with a large rural population, the concentration of co-operatives in a few sectors and the fact that every third co-operative was multi-sectoral is indicative of low degrees of differentiation and the risk of significant competition in their operations. Whilst 23% of co-operatives have a farming focus, only 1% have ***agricultural*** products and services focus indicating poor value chain linkages. Table 2.Number of co-operatives per sector in the province, Mangaung Metro and the district municipalities.

| **Co-operatives per sector** | **Free State** | **Mangaung Metro** | **Thabo Mofutsanyana** | **Fezile Dabi** | **Lejweleputswa** | **Xhariep** |
| --- | --- | --- | --- | --- | --- | --- |
| Total: | 4249 | 1050 | 1269 | 693 | 1033 | 204 |
| % of Co-operatives in FS |  | 2471 | 2987 | 1631 | 2431 | 480 |
| ***Agricultural*** products and services | 33 | 9 | 8 | 5 | 7 | 4 |
| Farming | 958 | 184 | 271 | 336 | 103 | 64 |
| Construction | 159 | 45 | 48 | 22 | 40 | 4 |
| Engineering and technical services | 6 | 2 | 1 | 2 | 0 | 1 |
| Financial services | 34 | 19 | 8 | 0 | 4 | 3 |
| General services | 238 | 98 | 50 | 33 | 47 | 10 |
| Health services | 18 | 6 | 7 | 1 | 3 | 1 |
| Manufacturing | 310 | 99 | 105 | 41 | 43 | 22 |
| Mining | 22 | 7 | 7 | 3 | 5 | 0 |
| News and advertising sector | 1 | 0 | 1 | 0 | 0 | 0 |
| Personal services | 135 | 28 | 63 | 19 | 18 | 7 |
| Processing | 74 | 11 | 22 | 8 | 25 | 8 |
| Professional services | 75 | 28 | 33 | 4 | 10 | 0 |
| Real estate sector | 10 | 5 | 5 | 0 | 0 | 0 |
| Telecommunication services | 1 | 1 | 0 | 0 | 0 | 0 |
| Tourism and hospitality | 389 | 90 | 124 | 37 | 117 | 21 |
| Trade services | 264 | 74 | 100 | 23 | 57 | 10 |
| Transport and logistics | 37 | 14 | 13 | 1 | 8 | 1 |
| Vehicle services sector | 18 | 5 | 8 | 1 | 3 | 1 |
| Multi-purpose | 1393 | 300 | 367 | 153 | 527 | 46 |
| Angelic | 46 | 18 | 16 | 1 | 10 | 1 |
| Unknown | 28 | 7 | 12 | 3 | 6 | 0 |

Figure 1.Sector composition of co-operatives in the Free State Province.

The dominance of the categories of ‘farming’ and ‘multi-purpose’ is mirrored in the sub-regional ***data*** (see Figure 2). In three of the five regions, ‘multi-purpose’ co-operatives are the dominant category and in two it is farming co-operatives. The low presence of manufacturing is noteworthy, particularly in the Mangaung metropolitan and the Fezile Dabi District areas. In the latter farming co-operatives dominate but with the district's primary urban centre Sasolburg being home to the SASOL petrochemical complex with downstreaming linkage potential, one would have presumed economic opportunities existed for manufacturing co-operatives which state development agents might have sought to pursue and to facilitate. Figure 2.The spread of co-operatives by sector and sub-region of the Free State Province.

From these initial findings, which indicate the very recent establishment of most of the co-operatives in the province, it appears highly unlikely that the birth explosion of co-operatives is the result of members in communities voluntarily and spontaneously deciding that they want to formalise their entrepreneurial efforts through forming co-operatives. It appears far more likely that the rapid growth has been in response to direct state intervention and encouragement as detailed above (Khumalo, 2014; Westoby, 2014). Also in line, with the national trends detailed above and the estimated failure of some 88% of co-operative enterprises nationally (Twalo, 2012), it is probable that many of the 3826 co-operatives registered in the province between 2009 and 2013 will not survive economically. The apparent failure to focus on value chain development and their focus instead on community consumption activities such as in hospitality suggests limited growth capacity or integration into mainstream activities. It is noteworthy that there was almost no focus on user co-operatives which, as Philip (2003) argues, can play an important role as a livelihood support mechanism in poorer communities.

**Detailed firm *surveys***

The economic activities of the interviewed firms are depicted in Figure 3 which shows a striking dominance of multi-sector firms (58%), followed by hospitality and catering (14%) and trading (9%). No other sector achieved above the 5% level. Figure 3.Sector spread of interviewed co-operatives.

Interviews with co-operative members indicated that a substantial number of co-operatives were established with the specific aim to gain income from public sector expenditure through procurement and tendering. Apart from a number that stated that ‘tendering’ for state contracts is their activity, a large number aimed at benefitting from feeding schemes (schools) and cleaning services (public sector buildings). This is more of a dependence on state expenditure than a strategy to grow the economy.

The 220 co-operatives originally had 1987 members, or an average of 9.03 each at the time of their establishment. Women dominate membership, accounting for 63% of members. At the time of the interviews overall membership numbers had declined by 24.1% to 1562. Of the 1562 members, only 226 (or some 14%) are employed in their co-operatives and therefore interpretation of the available ***data*** indicates that membership of co-operatives should not be equated with job creation.

When asked why members had left, the main reasons were as follows: no income (29%), died (22%), found other work (21%) and tensions in the co-operatives (14%). Respondents made comments such as: ‘members left because they didn't see any progress and support from the municipality’ (KI 1, 2014), ‘people didn't want to work’ (KI 2, 2014), ‘we lost all hope and are no longer interested in a co-operative’ (KI 3, 2014). Thematic analysis indicated that overall limited support after establishment, economic failure and internal tensions are clearly significantly challenges experienced by the 24% of co-operatives which had experienced loss of members.

Of the co-operatives ***surveyed***, only 37% were still operational, 31% never started operations, 21% had stopped operating and 11% were ‘not sure’ whether they were operational. These findings possibly suggest as both the rushed nature of their registration and the absence of proper planning and market research. Reasons given for failure include: not securing contracts from government (35%), lack of business skills (30%), conflict amongst members (21%), poor products and services (6%), inability to compete with formal enterprises (6%) and inability to compete with informal enterprises (3%). The anticipated role government would play in their business is striking and is suggestive of both lack of market research and the degree of dependence on the state which prevails. Low skills levels and internal conflict clearly detract from the potential for success.

In terms of input–output links of the operational co-operatives, businesses appear to be highly localised in terms of their supply chains and sales, relying on local knowledge and seeking to minimise transport costs. Of the 220 firms, 90% source inputs in the province, with 37% coming from the own locality and 24% from neighbouring towns. Fifty-eight per cent of sales are in their locality and 97% in the province.

The 37% co-operatives that were still functioning were asked if forming a co-operative had improved their personal turnover from the pre-formalisation levels. Only 4% of these noted a significant increase, 12% indicated a slight increase and 84% said there was none. In terms of profit margins, 86% noted that there had been no increase in financial sustainability with a further 8% indicating profits have increased only ‘a bit’. In the sample of 220 interviews, a mere 2.3% of co-operatives (5) have improved their profits more than ‘just a bit’.

The questionable nature of the business planning and market research which has preceded the establishment of co-operatives is borne out by the reality that only 56% of interviewed co-operatives admitted to having a business plan.

Despite the rather bleak picture which has been painted of co-operatives in the province, many are still optimistic: 29% expressed high levels of optimism, 43% were ambivalent in their responses and 28% were very negative about future prospects. Interviews indicated the optimism was based on expectations that the government would improve conditions, rather than optimism based on market opportunities. Statements such as ‘the success depends on the government’ (KI 4, 2014) and ‘local schools always need feeding services’ (KI 5, 2014) are pertinent.

**Discussion**

It is apparent from the preceding research findings that the public sector's well-intentioned, but extremely costly process of setting up co-operatives in the Free State Province, had very limited impact in achieving economically viable enterprises that can compete in a market-based environment and create sustainable job opportunities. The rapid growth in co-operative numbers since 2010 is matched by an exceptionally high failure rate with only 37% of ***surveyed*** firms remaining operational in 2014 and a mere 4% having a turnover much better than their turnover from informal activities prior to registering the co-operatives. The limited range of activities engaged in, an over-reliance on the state as market, very localised supply and retail links, and the fact that only 56% of co-operatives seem to have business plans does not bode well for the future. Initial government grants of R 300,000–R 350,000 in addition to substantial public sector costs (e.g. salaries and related employment costs of the community workers, officials in the DTI and DETEA) helped to establish co-operatives but, in many instances formal registration was all that was achieved. A real need exists for a business-oriented assessment whether support and training could meaningfully support those co-operatives that still ‘survive’. Acutely lacking within the co-operatives is management, marketing and financial skills. Equally important is the need for mentoring on issues ranging from conflict resolution to decision-making and role definition. Just as acutely lacking is a policy environment and extension services (from government) that address the need for economic growth to achieve sustainable enterprise growth and in its wake job creation. As a result, ‘formalisation of cooperatives does not appear to have had any meaningful impact on combatting poverty, unemployment or inequality and raises the question whether the overall strategic approach has not been an immense opportunity cost for the country's development’ (Wessels, 2014: 32). The logic of promoting enterprises with limited sustainability potential and the nature of the strategy and support provided within in the province must be questioned, but likewise these questions apply at the national level. No decision-maker at either national or provincial level can claim ignorance of previous reports seriously questioning both logic and strategy: An EU-sponsored study in 2010 established that government and local government generally lacked the skills to support co-operatives, inter-government collaboration was not working well and that many co-operatives had been established as a direct result of government encouragement and incentives and not market opportunities (Eising and Shenxane, 2010). This bleak conclusion was reinforced by the report of the Deputy Minister of DTI that in 2006–2009 the government had spent R62 million on co-operative development in terms of the CIS but it had only created 1550 jobs. In total, by 2010, the different arms of government had spent R 1bn on co-operative development but of the 22,080 registered co-operatives only 132 submitted financial statements as required and only 12% of registered co-operatives were surviving economically (Ntuli, 2010).

**Conclusion**

The Free State government has an understandable desire to empower impoverished communities and thus create income for a sizable number of the economically marginalised. However, this study and previous academic research and state reports have indicated ‘member-owned productive co-operatives’ enjoy only minimal success in terms of increasing the incomes and employment of members. The reasons are numerous and include grant dependence, low skills levels, lack of adequate market research and business planning, and internal disputes. Similarly a government policy which is driven by the perceived need to register co-operatives, many of which lack business plans in the case of the Free State, as opposed to facilitating an enterprise conducive environment, needs to be revised. Clearly support for co-operatives must go beyond just a focus on their establishment and provide active support for their operation, governance and training needs and must also assist with market identification and business strategy formulation. This will require a rethink on the part of the state as to what they should be doing, a more selective process of establishing co-operatives and long-term commitment to their continuity and success.

What one has unfortunately witnessed to date in the Free State is a situation in which a government, desperate to fulfil election promises of job creation, may through its own lack of planning, be exacerbating local-level frustrations. South Africa's recorded 88% failure rate of co-operatives and the negative findings of this study suggest, as Westoby (2014: 827) argues, that one is witnessing the ‘dilemma of statecraft’ with the resultant confusion of ‘the development process’. Clearly a rethink is required as to whether the formation of co-operatives is the remedy for not only the ‘excesses of capitalism’ but also for reducing unemployment and inequality. In an anti-capitalist mode, policy makers may assume the co-operative form as superior to the company, but the results of the current co-operative drive in the Free State Province of South Africa at least suggest the opposite may be true. Clearly, while there is a desire in South Africa to pursue alternate economic trajectories along the lines suggested by Gibson-Graham (in Cornwell (2011)) and Nonkovic (2012), a range of structural barriers need to be addressed before these goals can be realised. The need for the pursuit of ‘alternate economies’ is high on the government's agenda but ignoring the fundamentals of the economy and good business practice appears to be sabotaging that very agenda.

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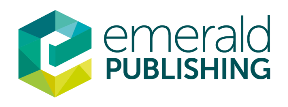


[***The econometric analysis of retail rents in Singapore***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5TW9-S371-DXF1-T18H-00000-00&context=1516831)

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**ABSTRACT**

Purpose

Primarily based on Alonso’s bid-rent model, the purpose of this paper is to examine the dynamics of the Singapore’s overall retail rental market by adopting a vector error correction model (VECM) estimation.

Design/methodology/approach

This paper uses the proxy for the overall retail rental value, which is indicated by a combination of the shop rent index from 2004 to 2013 and the retail rent index (RRI) in 2014, maintained by the Urban Redevelopment Authority (URA). The independent factors are the real gross domestic product (GDP), monthly earnings of individuals and vacancy rates (VR).

Findings

Such a behavioral model examines the dynamic structures that overshoot and/or diverge from equilibrium.

Research limitations/implications

The variables LOGGDP and VR are co-integrated of order one, I(1), while variables LOGME and LOGSRI are co-integrated of order two, I(2), to enable them to be employed in the VECM model.

Practical implications

The VECM model shows a good fit that allows the error correction term (ecm) together with the economic, financial and rental variables to jointly explain about 79.2 percent of the variation in the overall RRI. With a positive CoinEq1 coefficient that is positive and statistically significant at 5 percent level, it would take a long time for the system to return to its equilibrium once it has been shocked. Another variable that shows significant explanatory relationships includes past rents (index points) in the second order lags [D(LOGSRI(−2))]. The variable [D(LOGGDP(−3))], with a significant *t*-***statistic*** value at 2.916, also helps to explain the changes in the overall rents.

Social implications

This paper highlights the importance of the first and third differences of the lagged macroeconomic variables of the monthly earnings of individuals is moderately significant. The VR in the first and second differences is significant in accounting for the variation in changes of overall retail rents with their *t*-***statistics*** values being above 3.0. It is thus meaningful for policy makers to so enhance their in-depth understanding.

Originality/value

This paper fulfills an identified need to study how the results from the *ex post* forecasting estimates from the VECM for overall retail rents in Singapore can be enabled.

**Introduction**

As a global metropolitan city, Singapore’s retail sector serves as a vital economic pillar, with the capacity to generate over $32 billion in operating receipts in 2012. This sector plays an important role not only for the needs of the domestic market but is also intricately connected to the tourism industry, providing an avenue that draws 27 percent of every tourist dollar spent. Although previous studies have provided meaningful insights into the domestic retail sector’s outlook, the ***data*** collected, the analysis of the performance and the forecast of Singapore’s retail sector remain outdated and under researched. This is particularly so in the area of rental determination for shopping centers in the suburban area. Little has been done to examine the impact of demand and supply factors on retail rents in such a heartland area.

Comprising about 21,300 establishments as of 2012, the main activities of the retail trade comprise general merchandise, transport equipment, personal goods, household equipment and other retail trade. Given the rapid and sustainable progress of Singapore to transform itself into a global city, the retail landscape has also experienced significant transformation. The growing affluence of Singapore’s domestic market and the rising purchasing power of tourists from Asia, coupled with the government’s concerted planning efforts for Singapore, have resulted in a retail sector that has become highly competitive and concentrated in recent years. Singapore’s land use planning and conservation authority, the Urban Redevelopment Authority (URA), has envisioned the development of planned shopping centers in both the prime central districts and the suburban public housing new towns. As of the first quarter of 2014, Singapore is reported to have an island-wide retail stock of 61.5 million sq. ft. This retail space comprises a majority of 68.7 percent of the existing supply in the central region (which takes into account the Orchard Planning Area, the Downtown Core Planning Area, the rest of central area, and the fringe of central region), while the remaining 31.3 percent is located outside the central region.

The retail central area (RCA) comprises the following nine key planning areas: Outram, Museum, Newton, River Valley, Singapore River, Marina South, Marina East, Straits View and Rochor. It excludes the Orchard and Downtown Core Planning Areas. The outside of the central area refers to the fringe area (part of the central region), the east region, northeast region, north region, and the west region. Typically, each of five key planning regions of Singapore is served by at least one large suburban shopping mall.

Nevertheless, such elaborate and detailed planning in segregating the retail sector into different regions with the aim of decentralizing retail activity has resulted in large variations in the rents of retail accommodation. The primary shopping area refers to the Orchard Road corridor, which consists of the whole shopping belt from the junction of Tanglin Road/Grange Road to Orchard Road, including some parts of Scotts Road, all the way up to the Dhoby Ghaut mass rapid transit (MRT) station. This area contains the highest density of retail space on the island and is the prime location for the retail market in Singapore. Not only is the Orchard corridor a shopping haven for the domestic market, it also serves to attract the tourist market. This can be seen from the mix of major retail centers in the area, comprising mainly international retail chains, the boutiques that carry designer labels and the department stores that carry a wide range of retail goods and services. Some of the more prominent malls in this area are the Ion Orchard, Paragon and the Ngee Ann City. The Orchard Road corridor also plays host to newer malls like 313 Somerset and Orchard Gateway. Among them, the Ion Orchard retail center stands as the largest development with a net lettable area of over 660,000 sq. ft of retail space. According to the URA, the secondary shopping area refers to the area outside the primary shopping area but within the central area of Singapore. This can be subdivided into seven main areas, namely, Chinatown, High Street/City Hall, the Downtown Business District, the Jalan Sultan/Serangoon area, Marina Bay/North Bridge Road district, the Singapore River and the Bugis area. Rental value differs widely owing to the establishment of different forms of retail developments in such highly popular areas.

As for the suburban area, it comprises all other areas on mainland Singapore not covered under the above two categories. Owing to the 1991 Revised Concept Plan, the four regional centers incorporate a new trend toward retailing in an effort by the government to decentralize both the residential and commercial activities into the suburban areas of Singapore. For instance, these malls include Tampines 1 and the Tampines Mall and the agglomeration of Jcube, the Westgate, and the Jem at Jurong East and the Junction 8 at Bishan. Most of these suburban retail centers are concentrated in the immediate vicinity of MRT stations and within public housing new towns and large private housing estates. Such retail centers mainly cater to shoppers in the mid-range household budget, and they generally draw their customers from the immediate neighborhood. The bulk of Singapore’s retail accommodation space is concentrated in enclosed shopping centers with the shop houses below the public housing apartment blocks, and the retail kiosks within MRT stations making up the rest. Retail space can be generally classified under two categories, namely, the prime retail area (which is made up of the primary and secondary shopping area), and the suburban retail area (Tables I-III). Figure 1 shows the spatial distribution of Singapore’s retail space.

Contributing to approximately 4.6 percent of Singapore’s gross domestic product (GDP) in real terms, the retail industry is an important anchor that is more resistant to external and internal economic shocks. Apart from being a magnet that attracts and retains global brands and tourists, the retail industry also serves as an excellent platform for budding entrepreneurs to take advantage of Singapore’s established retail infrastructure and reputation. Although the central area remains the most popular shopping area for high-end merchandise among the local households and tourists, the suburban shopping centers that are not so reliant on the tourists’ patronage are benefitting from a teeming rise in domestic household traffic volume. Such a unique distribution of retail activity runs in tandem with the government’s plans to decentralize domestic household traffic and to enable the regional centers to provide for the substantial retail needs of the public housing households. These regional centers provide high convenience and significantly save on commuting time for nearby public housing households.

It is imperative to take into account regional and world events that can affect the demand and consumerism of the domestic retail industry. As reported by Savills, international visitor arrivals fell 1.7 percent year-on-year to 6.3 million in the first five months of year 2015. Recent and bad world news like the unfortunate disappearance of Malaysian airline aircraft MH370, the crash of its aircraft MH17, neighboring Thailand’s political uncertainties, and China’s monitoring legislation on overseas tour packages have so dampened tourism arrivals and their spending and have also adversely affected the growth pace of the world economy. As a result, domestic retailers have suffered in retail sales turnover, and they are increasingly resistant to retail rental hikes, amid rising business costs and the slowdown in retail sales. In addition, retailers are experiencing stiffer competition from the proliferation of e-commerce markets. This has adversely affected retail sales volume, causing domestic retail rents to fall.

The interplay of the foregoing external and internal factors is a highly relevant consideration when determining the rents for retail space. For a sustainable domestic retail sector that significantly contributes to the Singapore economy, it is imperative to examine the historical to future retail rents in the mid-term of the next five years. In the light of limited studies, this paper uniquely seeks to understand the structural dynamics of Singapore retail rents via adopting a robust VECM, based on a theoretical spatial equilibrium framework. Therefore, this paper accords due attention to the following issues: to determine the economic variables that affect Singapore’s retail rents;to estimate a VECM that examines the structural dynamics of the retail rent; andto deploy the impulse response analysis and the variance decomposition to examine the relationship between the explanatory variables of interest.

Macroeconomic factors like real GDP, inflation, interest rates and household income are employed to examine their influence on retail rental movement. Physical characteristics and locational attributes are excluded from the paper. The required ***data*** cover the period from the first quarter of 2004 to the second quarter of 2014. Hence, this paper comprises six sections, with the first section providing the introduction, the paper’s significance, objectives and study scope. The next (second) section comprises the review of the related literature, while the third section outlines the theoretical framework. The fourth section discusses the research approach, while the fifth section discusses the findings and results. The sixth section concludes the paper.

**Review of the related literature**

This paper looks comprehensively at the related literature with regard to the performance of retail real estate sector, both local and abroad. It covers suitable time series model and the most suitable one to facilitate the study. Although studies have been conducted to forecast retail rents, most studies are focused on the UK and the USA and even the Hong Kong’s retail real estate sector. The determination and forecast of Singapore’s retail rents by Ho (2009) has been investigated via adopting system dynamics modeling, but such a study was undertaken as far as back in 2004. The associated analysis and forecasts may well need to be updated owing to changing market conditions of the Singapore retail sector.

**Retail real estate time series models and rental forecasts**

Hillier Parker Ltd (1987) reiterates its perspective of the difficulty to establish a single equation model of retail real estate rental determination, as rents vary substantially among retail real estate shopping centers. They provide insights that retail real estate rents in the high-street areas, i.e. the prime areas, do not seem to react to changes in economic conditions in the same way as they do in secondary areas. The implication is that location-based fundamentals are more important in determining the high-street retail real estate rents. Hardin and Wolverton (2000) have investigated the determinants of neighborhood shopping center rents. They find that the primary trade area characteristics and the real estate-specific characteristics comprise the determinants of retail real estate rents. For the primary trade area characteristics, household income and population are integral in determining the demand and purchasing power of households. Other key factors affecting retail real estate rents include the retail real estate sq. footage, property age, and anchor tenants.

The Hillier Parker study highlights the positive marginal effect of proximity to higher order retail real estate assets, but that this marginal effect sharply diminishes within one-half mile of a mall. For neighborhood retail real estate assets located near higher order assets, they benefit from the effective extension of the maximum potential retail real estate patrons. As consumers become more aware of additional retail real estate opportunities in close proximity to higher order retail real estate assets, they incorporate such opportunities into their retail patterns. This way, the demand for household retail consumption is enhanced. Tsolacos (1999) reiterates that retail activities and retail real estate demand are determined by retail profit, retail sales, disposable income, GDP and consumer expenditure. It is found that the main macroeconomic factors are real GDP, retail sales volume and consumer expenditure. Retail real estate rents and capital values are procyclical, and they tend to lead the retail real estate building cycles.

The impact of economic and market conditions on retail real estate values and rents has been studied by Chung (2004). He highlights that the Hong Kong retail real estate sector is significantly impacted by six demand-side variables, which can largely explain the retail rental fluctuations on average. His study divides such demand-side variables into positive and negative influences on the retail real estate rents. Positive influences are reported, namely, for retail sales, inflation and the domestic common stock market performance, while negative influences are reported for the mortgage interest rate, unemployment and departure rates. He highlights that the retail real estate supply is an insignificant variable in the determination of retail real estate rent. Wheaton and Torto (1995) have reiterated that the mismatch of retail real estate demand and supply not only resulted in the spikes of retail real estate vacancy rates (VR) that prompt retail real estate rents to weaken but also challenged such a mismatch and the financial worthiness of retail landlords and creditors. Benjamin et al. (1998a, b) have demonstrated that changing retail real estate rental rates, retail sales turnover, population growth and the domestic population’s aggregate disposable income have all significantly influenced the demand for retail real estate. Their study highlights that the retail real estate supply is dependent on the prevailing economic climate, land availability, capital market cycles, interest rates and tax law changes, all of which affect investor confidence and consumer confidence. They conclude in a related study that the retail real estate rental rates are largely determined by the previous year’s rental rates and that the current year’s higher VR lead to smaller retail real estate rents.

Hardin and Wolverton (2000) have discovered that the primary trade area characteristics and the retail real estate-specific characteristics are significant determinants of retail real estate rents. They include household income, household purchasing power, retail real estate demand, the retail real estate center’s sq. footage, property age and anchor tenants. Positive marginal effect of proximity is observed for the higher order retail real estate centers. The marginal effect of proximity to malls has a positive impact on rents but significantly diminishes within one-and-a-half mile from a mall. Micro-market factors can include accessibility, visibility, a trade area’s household count, the household income and car parking. The base retail real estate rent, in annual rent per sq. ft, is significantly affected by the initial lease term, percentage rents and the tenant’s status as a national chain. Both researchers believe that the retail real estate rent is a function of the VR, the market and its draw, the lease and location. McGough and Tsolacos (1995) have established a relationship and cyclical pattern for the retail real estate demand-side variables like GDP in real terms, consumer expenditure and disposable income in relation to the retail real estate cycle. UK retail real estate rental determination is significantly influenced by consumer spending in the aggregate, which is considered by agents when new rents are negotiated.

Ludgin et al. (1996) highlight that the investment value of a specific retail center may be less dependent on national trends and may be more dependent on the retail sales competition from the other domestic retail real estate centers. The underlying factors comprise low-retail vacancy and the constraints on future development like zoning, limited available sites and the Master Plan restrictions. Other factors comprise population growth and the local population aggregate disposable income. As the retail sales volume is a contributing factor to retail real estate rental determination, it is pertinent to examine the underlying factors that impact retail sales volume. Eppli and Shilling (1996) have revealed that the domestic retail competition and the household income factors can effectively explain a particular shopping center’s retail sales. A weak relationship occurs between a shopping center’s actual retail sales and the distance between the center and its competition. From some 38 regional shopping centers ***surveyed*** and subjected to multiple regression analysis, the retail sales will decrease in accordance with lower aggregate household income in a particular region. A better determinant of a shopping center’s overall success may well be the size of the shopping center relative to its competition.

According to Lowry (1983), retail consumption increases when individuals are confident of their employment prospects or are employed. When they are unemployed or doubtful of their career prospects, they tend to restrict spending. Findings show the inverse relationship between unemployment and retail sales in the decade of the 1970s. When the unemployment rate increased, the growth in retail sales abruptly slowed. In those years when the unemployment rate decreases, retail sales growth accelerated. The performance of the economy and consumer confidence also affects individuals’ spending level and the type of items they are willing to purchase, especially luxury goods. Townsley (2002) reiterates that a consumer, who has an optimistic view of continued employment in a successful company, should he be presently employed, is more likely to have a higher spending level than an unemployed consumer or one under fears of retrenchment. Demand and retail sales are strong during times of economic prosperity, and both are weak during times of economic recession.

Svets (2010) highlights that the UK retail real estate market is an attractive investment vehicle for the large and long-term institutional investors like the pension funds and insurance companies. The retail real estate market is considered to be one of the most stable direct real estate markets that offers a good reward for the risks undertaken. He suggests that there is a relationship between retail real estate rents and retail sales volume owing to the “percentage from turnover” lease agreement structures, in which a portion of rents can be pegged to the retail sales turnover that is generated on a leased retail real estate asset by the tenant. Retailers may often hold market power to renegotiate rental contracts or to request temporary discounts if their businesses are not doing well.

Furthermore, Lin (1963) has demonstrated that total retail sales changes are responsive to changing population levels, income per capita, local government expenditures and the number of establishments. Such determinants do not tend to vary much over time. Ingene and Yu (1981) concludes that total retail sales change with respect to the effective buying income per capita, the number of households with one or more automobiles (a proxy for mobility), the unemployment rate, the average household size, the percentage of population living in an urbanized area, the population per square mile and the total population.

On forecasts, the Urban Land Institute and PriceWaterhouseCoopers Ltd (2014) provide their published overview based on a ***survey*** of US respondents and on inflation and interest rates that are set to increase moderately. While Singapore has enjoyed a robust but maturing retail sector over the past decade, it however experienced growth moderation from 2012 to 2013, partly owing to slower expansion of the wholesale trade, the retail trade and the transport and storage sectors. Singapore retailers are cautious in their expansion plans, as they seek “tried and tested” retail real estate to enhance their revenue. The advent and popularity of e-commerce and mobile e-commerce have affected retailers with relatively lesser physical shop space required. PayPal (2013) has reported that the Singapore mobile commerce market enjoyed phenomenal growth from S$43 million in 2010 to S$328 million in 2011. The market is expected to be worth US$681 million in 2015, up from US$384 million in 2013.

Savills (2013) has reported that the Asia-Pacific e-commerce retailers like Qoo10, Taboo, Rakuten and the upcoming star Lazada have all taken up a significant share of the retail market place. Competitive pricing, a wider variety of items, and the convenience of online shopping have immensely attracted local shoppers and tourism spending to sustain the prime and traditional retailers. Retailers are increasingly turning to smaller shop spaces to better manage their rental and labor costs. Rental increase has been marginal in 2014, and any increase is expected to inch up minimally. While retailers continue to feel the pressure from higher rents and the proliferation of e-commerce and mobile e-commerce, the pressure may be somewhat eased owing to the ample supply in the pipeline of about 4.2 million sq. ft of new net lettable retail space (inclusive of food and beverage space and of entertainment uses) to be completed from 2Q2014 to 4Q2017. Such a supply spike may help to prevent rental hikes and to provide alternative shop spaces for retailers. Figure 2 depicts the URA’s anticipated supply.

The Orchard Road corridor in Singapore’s designated retail areas enjoys a take-up rate that is moving faster than the retail real estate net. VR have fallen from 7.8 to 7.4 percent with the entrance of new brands, like the Spanish Doughnuts which has established its Somerset premises. Resulting from its major refurbishments plan, the central business district (CBD) area benefitted from a rise in VR from 7.6 percent in Q12014 to 8.8 percent in Q22014. In tandem with the suburban areas development like the Jurong Lake District in the west region of Singapore, retailers are demanding retail real estate in this district.

**The theoretical model**

Most studies are concerned with the neoclassical production theory and the spatial models of Alonso (1964), an extension of Von Thϋnen’s model of an ***agricultural*** economy. To illustrate how variations in cost and revenue occur with respect to distance from the city center, Alonso (1964) has adopted the bid-rent curve to determine the location that offers the greatest profit for any particular firm. Although the result of the concentric circles is not modeled after or specific to any city, the Alonso bid-rent curve forms an effective basis for understanding the forces that influence the retail real estate market. The bid-rent curve enables a better understanding that rent is higher for areas like city centers, which denote the heart of the regional centers or the CBD or the prime Orchard Road retail belt. CBDs and the heart of regional centers command higher rents because they are identified as areas that are most accessible and able to generate the most revenue. It is owing to the interests of different land uses like the commercial, industrial and residential uses, whose bid-rent curves reveal their preferences for high-activity areas.

Barrett and Blair (1988) and Guy (1994) reiterate that commercial activities like retail usually congregate at the heart of regional centers, CBDs or city centers, because such land uses must be located at the most accessible part of the city. Revenues should be sufficiently high for retail use to be profitable and that such a land use can outbid other land uses. The most accessible land uses can be desirable to other land uses like the industrial and residential land uses, while commercial land users have to bid higher to obtain the most accessible land uses. Therefore, retail real estate rents can widely differ across different locations. The Alonso bid-rent model’s weakness lies in its high relevance to locational attributes, as compared to other key macroeconomic factors for the economic, financial and market conditions, which are usually downplayed. The interplay of demand and supply factors like the economic, financial and market conditions should well determine retail real estate values and rents. Hence, this paper’s theoretical model factors in demand and supply considerations that comprise several of the following macroeconomic time series factors.

**Real GDP**

Most widely used as a demand-side measurement at an aggregate level, GDP is a measure of a country overall economic performance. As the aggregate value of output produced by Singapore’s economy, GDP not only reflects a country’s economic growth but also serves as a broad indicator of the relative contribution of an industry sector. This assumption gains a lot of support from empirical studies (Gardiner et al., 1988; Dobson et al., 1992; Giussani et al., 1993; RICS, 1994; Arcy et al., 1994, 1998; McGough et al., 1995, 1998; Tsolocas et al., 1998; Higgins et al., 2000; MacFarlane et al., 2000).

**Growth in monthly household income**

Average wages/compensation ***data*** refer to the average monthly earnings of all employees who are active contributors to the Central Provident Fund (CPF). It covers all Singaporeans and permanent resident employees in both private and public sectors. Earnings refer to all remuneration in money due or granted to an employee in respect of his/her employment before the deduction of the employee’s contributions to pension funds (the CPF) and personal income tax. They include bonuses, basic wage, overtime payments, commissions, allowances and other monetary payments (e.g. food, shift or transport allowance) but exclude employers’ CPF contributions. From these ***data***, growth of monthly household income is calculated, as it is an essential demand variable that indicates the spending potential of households. This in turn forms the possible revenue of retailers. A growth in monthly household income is assumed to increase the spending power of households, therein sustaining the retail sector.

**Change in population growth**

Change in population growth is derived from the mid-year estimates of Singapore’s total population. These estimates are based on the national population ***censuses*** by the Department of ***Statistics***, and Singapore includes all residents regardless of legal status or citizenship – except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of their country of origin. For the purposes of this study, the yearly figures of Singapore’s population will be interpolated to retrieve the quarterly population figures. The growth of population at each quarter would then be calculated as these figures contribute to the volume of customers for the retail sector.

**Retail sales index, Singapore**

This index measures the short-term performance of retail industries based on sales records of retail establishments. Retail establishments refer to those that sell merchandise directly to consumers. The health of retail sales for retailers would determine their demand for retail space.

**Prime lending rate (PIR)**

The PIR for Singapore is used in this paper, as it is reflective of the liquidity of funds available in the retail real estate sector for investors, who are looking to increase their stock or enlarge their retail space. These figures refer to average rates compiled from those quoted by ten leading banks and finance companies.

**Inflation**

Measured by the consumer price index, inflation reflects the annual percentage change in the cost of average consumer acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The weights are usually derived from household expenditure ***surveys***.

**Purchasing power; private consumption expenditure**

Purchasing power, otherwise known as private consumption expenditure, measures the spending capacity of consumers. The volume of expenditure affects the health of the retail real estate sector as well.

**URA retail rent index (RRI)**

From the studies by Atteberry and Rutherford (1993), RICS (1994) and McGough and Tsolacos (1995), recent and past information on rents can be used to explain rents in the current period. The URA RRI can be used to make short-term predictions. This finding is important to the construction of retail rent equations, since past values of rents can be included assuming that they convey information that is not contained by other explanatory variables. Therefore, the model of retail rents determination in this paper incorporates past values of rental changes.

**URA retail price index (RPI)**

Recent and past information on retail prices can be used to explain prices in the current period. The URA RPI can be used to make short-term predictions on the basis that past values of prices convey information, which is not contained by other explanatory variables.

**VR**

The supply of retail space for any period consists of new properties coming into the market, and pre-existing buildings that are vacated and put on the market for lease or sale. A rise in retail space requirements can be partly or totally met by the existing supply of buildings. This is likely to restrict rental growth when demand for retail space tends to rise. Then part of that demand, which is satisfied by the supply of buildings, is assumed to be reflected in the absorption rate of retail floor space. A high absorption rate over a period of time indicates that a significant proportion of the demand for retail space is accommodated and that rental growth is likely to be subdued (rents may not increase as much as they would have otherwise risen). An inverse relationship can, therefore, be argued between the absorption rate and the growth rate of retail rents. The greater the proportion of demand satisfied by the existing supply, the greater the negative influence of the supply side on rental growth. This paper’s model assumes that the rental determination of retail space is dependent on demand and supply factors. This model excludes the factor of VR as there are insufficient ***data*** recorded over a period of ten years. With that in mind, the theoretical model is hypothesized that the relationship between R, retail rents (the dependent variable), and several independent variables can be expressed as follows:(1)Rent=f(GDP,MI,PG,RS,PIR,I,PP,VR,TS) where GDP is the change in real gross domestic product, ME the growth in monthly household income, P the change in population growth, RS the volume of retail sales, IR the prime lending rates, I the inflation, PP the purchasing power; private consumption expenditure, VR the vacancy rate, and TS the total supply.

**The methodology**

Econometric modeling is essential to improve the understanding of retail rental behavior. Most studies adopt econometric analysis to model the influence of different direct real estate attributes on rent. Rosen (1974) has formalized the structural interpretations of the hedonic method, in which the sum of implicit prices that the market bestows on different attributes, and associated with that direct real estate, will result in the price for a particular real estate asset. Regression analysis can be adopted to derive the implicit price of each retrieved attribute, the hedonic price and the relative importance that each attribute has in determining the overall price of the direct real estate asset. The most common approach is the ordinary least-squares method (Ambrose, 1990; Fehribach et al., 1993; Sivitanidou, 1995). Other methodologies include the factor-analytic linear structural relations (LISREL) model by Lockwood and Rutherford (1996). This model is used to address measurement problems encountered by standard regression. LISREL model’s strengths lies in its ability to reduce estimation variance and measurement problems, arising from the errors in variables. However, the LISREL model relies on strong correlations among the proxy variables chosen to load a certain factor. If the chosen proxy factors are only slightly correlated, then there is little confidence that the factor truly represents the intended attribute.

Underlying econometric theory is built upon the stationarity concept, where its mean and variance do not vary systematically over time. As most macroeconomic time series are non-stationary, the concept is violated. This is because non-stationary time series produces spurious regression where no appropriate inference can be inferred. Spurious regression reveals a significant relationship (high R2) between two totally unrelated time series variables when regression analysis is conducted. If the regression model variables are not stationary, then it can be proved that the standard assumptions for asymptotic analysis will not be valid. This means that the usual “t-ratios” will not follow a t-distribution and that the hypothesis tests about the regression parameters will not be valid. In response, Granger (1981) suggests that a non-stationary time series variable can be made approximately stationary by differencing it d times.

If a non-stationary series, yt, is to be differenced d times before it becomes stationary, then it is integrated of order d. It can be written as yt ∼ I(d). So if yt ∼ I(d), then Δdyt ∼ I(0). An I(0) series means that it is a stationary series and will cross the mean frequently. An I(1) series contains one unit root while an I(2) series contains two unit roots and so will require differencing twice to induce stationarity. Both the I(1) and I(2) series can wander a long way from their mean value and rarely cross this mean value. Engle and Granger (1987) restate that if a linear combination of two or more I(1) series has a long-run relationship, the errors have the tendency to disappear and return to zero, i.e. I(0). If such a relationship exists between two non-stationary time series, then the regression residuals are stationary and that the non-stationary time series are “co-integrated”. The stationary linear combination is the co-integrating equation and can be interpreted to be a long-run equilibrium relationship among the variables. No co-integration means that the variables concerned can diverge from one another in the long run. Thus, co-integration is a more appropriate integral part of a model for non-stationary time series variables.

In this paper, the methodologies of Johansen (1988) and Johansen and Juselius (1990) for the VECM are adopted to test for the presence of a co-integrating vector. The VECM has the benefit of proceeding without conducting the two-step estimation process, required by the Engle-Granger co-integration. The VECM also helps to minimize any error in the co-integration test. The Johansen co-integration test determines the number of co-integrating relations by testing for the characteristic roots. Disequilibrium may exist in the short run, but as the VECM is a restricted vector autoregressive (VAR) model, it can adjust for short-run deviation if co-integration is detected. To ensure that the vector error correction term is Gaussian, an appropriate lag length can be estimated from a VAR model that has the advantage of not having a priori restrictions imposed on it. The VAR model is therefore appropriate to determine the lag length to be subsequently used in the VECM.

Prior to the adoption of the VECM, several tests are conducted to ensure the robustness of the ***data*** and its analysis. The variables are tested for stationarity via the unit root Augmented Dickey-Fuller (ADF) tests. The lag length of the variables is determined via the Schwarz information criterion. The co-integration model was first introduced by Engle and Granger (1987) to examine the existence of a long-run equilibrium relationship between co-integrating variables over time. Engle and Granger have noted that a linear combination of non-stationary variables, as proposed from economic theory, may well be stationary. The resulting stationary linear combination is the co-integrating equation. It is interpreted to be the long-run relationship among the concerned variables that in turn consider the short-run dynamics of all variables in the co-integrating regression. The co-integrating equation is the error correction term, i.e. the deviation from long-run equilibrium, and it is gradually corrected via a series of partial short-run adjustments. The VAR model of the below equation can then derive the subsequent VECM:(2)yt=β1yt−1+β2yt−2+⋯+βkyt−k+ut

The resulting VECM can be expressed in the following equation:(3)Δyt=∏yt−k+Γ1Δyt−1+Γ2Δyt−2+⋯+Γk−1Δyt−(k−1)+utwhere ∏(∑j=1kβi)−Ig=Γi=(∑j=1iβj)−Ig and Π is a long-run coefficient matrix since all the Δyt−i=0.

**The *data* analysis**

The VECM is adopted in this paper to examine the presence of the co-integrating relationship between economic and specific factors affecting the overall retail real estate rents in Singapore. Quarterly ***data*** for the Shop Price Index, Shop Rental Index and total supply of shop space are obtained from the URA’s press release updates, which are published quarterly. The retrieved shop ***data*** are representative of Singapore’s overall retail sector. It is only in 1Q2014 that URA included the ***data*** source of more retail shops in Singapore and renamed the sector as Singapore’s retail industry.

This paper’s analysis utilizes the retail rents that are based on the retrieved shop ***data*** from 3Q2004 to 4Q2013 and the updates for 1Q2014 to 4Q2014. Relevant time series ***data*** for real GDP, the Singapore population, the PIR and the VR are retrieved from the SingStat Time Series database, maintained by the Department of ***Statistics*** under the Ministry of Trade and Industry. The ***data*** capture the dynamics of the Singapore overall retail sector between 3Q2004 and 2Q2014, giving a total of 38 observations that are adequate to enable the VECM model estimation. With the exception of the VR variable, the other variables in Table IV comprise real GDP, the average monthly earnings of individuals, and the URA Shop Rental Index are utilized in their natural logarithms to determine the dynamics of the overall retail rents in Singapore.

**Testing for stationarity and the order of integration**

It is essential to first ensure that the VECM variables are of the same order of integration. To conduct the co-integration analysis, the required order of differencing for the time series variables is determined to achieve stationarity. The ADF tests are adopted for this purpose. The ADF test allows for up to four lags to be determined to validate as to whether the variables under investigation are stationary in their levels or in the order of difference d. The estimated ADF values for the variables in the levels and in the first differences are presented in Table V.

The ADF results in Table V, prior to first differencing, indicate that all the variables do not reject the null hypothesis of having a unit root at the 95 percent critical value. Likewise, every variable does not reject the null hypothesis at 90 percent critical value. Generally, all the variables are non-stationary series at the 95 percent critical value. After first differencing, the ADF results in Table VI indicate that the variables LOGGDP and VR reject the null hypothesis of having a unit root at 95 percent critical value. Variables LOGME and LOGSRI will require second order of differencing for these variables to be stationary. Thus, variables LOGGDP and VR are co-integrated of order one, I(1) while variables LOGME and LOGSRI will be co-integrated of order two, I(2), to enable them to be adopted for the VECM (Table VII).

**The VAR lag length selection**

The appropriate lag length is to be established as it is required for co-integration and the VECM. The appropriate lag length is determined via the Akaike Information Criterion (AIC) as shown in Table VIII. The lag structure of 3 is determined based on the 37 ***data*** observations. While the Schwarz information criterion (SC) indicates that the lag order is 2, the AIC, the LR test ***statistic*** and the Hannan-Quinn (HQ) information criterion indicate instead that the lag order is 3. Thus, the lag order 3 is chosen to be the appropriate VAR lag length.

**The Johansen maximum likelihood approach**

Once the appropriate VAR lag length of 3 is so confirmed, the appropriate VAR model can be selected prior to testing for the number of co-integrating vectors that exist in the model. The VAR model with an intercept and with no trend term is adopted to define the retail real estate rental function. The resulting co-integrating analysis is presented in Table IX.

From Table IX, the trace and maximum eigenvalue ***statistics*** indicates that there is at most one co-integrating equation, denoted by “r”, at the 5 percent critical significance level. The null hypothesis of r=0 and r=1 are rejected by the trace and the maximum eigenvalue ***statistics*** at the 5 percent critical significance level. There is at most one co-integrating equation indicated. Once the number of co-integrating vectors that exist in the VAR model are established, the next procedure is to estimate the coefficient of the co-integrating vector. This is achieved by normalizing the coefficient of the dependent variable, SRI. The normalized co-integrating vector is included as the long-run error correction mechanism (ecm) in the VAR model of Table X. The standard errors, shown in parentheses, indicate that the estimated coefficients for LOGSRI, LOGGDP, and LOGME are significant at the 5 percent critical significance level.

**The VECM**

The error correction mechanism (ecm) is identified and estimated under the Johansen maximum likelihood test. The ecm is incorporated into the VAR model to adjust for the model’s short-run deviations. The VAR model with an intercept, with no trend term and with the VAR lag length of 3, is the appropriate model. This resulting model with the lag length of 3 is the VECM. The VECM is developed and estimated to explain the causal relationships between the change in the overall retail rental value and the other key economic variables (factors) like real GDP, the monthly earnings of individuals, and the vacancy rate.

The R2 of the VECM in Table XI indicates a good fit, such that the ecm term together with the economic, financial and price factors can jointly explain about 79.2 percent of the variation in the changing overall retail rental index of Singapore. The coefficient of the only co-integration equation, CoinEq1, is positive and is statistically significant at the 5 percent critical significance level. However, the reasonably small coefficient value of 0.137596 for CoinEq1 suggests that it takes a relatively long time for the VECM to return to its equilibrium, once it has been shocked. Another variable that shows significant explanatory relationships with respect to changes in the overall retail rents includes past rents in the second order lags, i.e. [D(LOGSRI(−2))]. The variable [D(LOGGDP(−3))] with a significant t-***statistic*** value at 2.916265 helps to explain changes in the overall retail rents.

Both the first and third differences of the lagged macroeconomic variables for the monthly earnings of individuals are moderately significant. Of the remaining variable, the VR in both its first and second differences are significant in accounting for the variation in changes of the overall retail rents. Their corresponding t-***statistic*** values are above 3.0. Tests are also conducted to check for the problems of serial correlation and heteroskedasticity along time in Table XII.

The diagnostic tests of Table XIII show that the appropriate VECM model has no major heteroskedasticity and serial correlation problems. This VECM model then undergoes a test for its efficiency in forecasting the short-term SRI. This is made possible through the use of a shorter model estimation period from 2005Q3 to 2014Q2 to carry out the ex post (in-sample) forecasts for SRI, the RRI, covering the period from 2004Q3 to 2014Q2. Table XIV presents the forecasted values of the VECM against the actual changes in the SRI.

**The variance decomposition and impulse responses analysis**

The dynamic responses of the Singapore overall retail rents from its own rental shocks and from its other key explanatory factors are tested and traced via adopting variance decomposition analysis and impulse response analysis (see Figures 3 and 4). The generalized forecast error-variance decomposition arising from the one-standard error shock to the factors of the co-integrating relation is estimated. Table XIV presents the corresponding variance decomposition for real GDP (LOGGDP), the monthly earnings of individuals (LOGME) and the VR over 50 estimation periods. The SRI accounts for the majority of its own variance for the first eight periods. Thereafter, the self-inflicted LOGSRI variability effects are changed to look at the shocks inflicted by LOGGDP, LOGME and VR, which can explain more than 60 percent of the variation from the ninth period onward.

Figure 5 depicts the Cholesky impulse responses from one-standard error shock to the VECM equation. The results indicate that the impulse responses to the shocks from LOGGDP and VR are observed to fluctuate throughout the 50 estimation periods but achieving narrower variations only after 26 periods. However, LOGME fluctuates throughout all 50 periods. The LOGSRI returns to a position closer to their initial values after LOGSRI is shocked. However, the effects of LOGGDP, LOGME and VR slowly dampen to stabilize mildly at new sustainable values. Shocks from LOGME demonstrate the most volatile responses of changing overall retail rents. The impulse response coefficients provide pertinent information to analyze the dynamic behavior of a factor concerned, owing to a random shock from the other key factors.

**Conclusion**

To understand the structural dynamics of Singapore’s overall retail rents, a VECM is developed for this paper. Based primarily on Alonso’s bid-rent model, the VECM helps to establish the dynamic relationship between overall retail rents and other key demand and supply variables. As most of the time series is non-stationary, co-integration is adopted to aid the analysis. The estimated VECM model which demonstrates a good fit result is indicative that the error correction term (ecm) and the key economic, financial and price factors can jointly explain about 79.2 percent of the variation in the changes of Singapore’s overall RRI. The coefficient of CoinEq1 is positive and is statistically significant at the 5 percent level. However, the reasonably small coefficient value of 0.137596 for the CoinEq1 suggests that it takes a long time for the appropriate VECM to return to its equilibrium once it has been shocked. Another variable that shows significant explanatory relationships with respect to changes in the overall retail rents includes past rents (index points) in the second order lags [D(LOGSRI(−2))]. The variable [D(LOGGDP(−3))], with a significant t-***statistic*** value at 2.916265, also helps to explain the changes in the overall rents. The first and third differences of the lagged macroeconomic variables for monthly earnings of individuals are moderately significant. Of the remaining variable, the VR in both the first and second differences are significant in accounting for the variation in changes of the overall retail rents and with their t-***statistics*** values being above 3.0.

Results from the ex post forecasting estimates show that the appropriate VECM is efficient in predicting overall retail rents in Singapore. The Cholesky forecast error-variance decomposition shows that the one-standard deviation shock to the overall retail rents in Singapore (SRI) accounts for the majority of its own variance for the first eight periods. The shocks caused by LOGGDP, LOGME and VR explain more than 60 percent of the variation from the ninth period onward. The ***data*** collected for this paper comprise of the shop ***data*** from 2004 to 2013 and the retail ***data*** for the first and second quarters of 2014. The result is a vast difference between the volumes of ***data*** collected as more retail spaces are included as of 2014. Future research can involve an updated retail sector ***data*** to obtain a more rounded analysis in understanding the retail rent dynamics. This paper has formulated the retail real estate rental model, based on the overall retail sector of Singapore, inclusive of both the public and private retail markets. The retail sector can be further segmented by locality. Therefore, further research can be undertaken to deepen the analysis of the rental dynamics of such subsectors.

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[***Shocking History of workhouse life was a project worth sharing***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5HM2-8V11-JCG2-C33B-00000-00&context=1516831)

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**Section:** FEATURES:HISTORY; Pg. 2-3

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**Body**

BACK in November, a stone was unveiled at Rosemary Green in Eastville in memory of men, women and children who had once been buried in unmarked graves there.

They were inmates of the Eastville Workhouse at 100 Fishponds Road, a local institution, which in its Victorian heyday was as hated as it was feared.

Folk memories of Britain's workhouses are now fading, but it wasn't so long ago that the very word 'workhouse' was used to frighten small children, and indeed fully-grown adults. The workhouse was the place of very last resort, where you went when you had absolutely nothing left and were desperate for food and shelter.

The pattern of life in workhouses varied according to time and place, but it was rarely pleasant, and will be familiar to anyone who's read Charles Dickens. Men and women were segregated, families were split up, and there was a daily routine of dull work and a meagre diet, for which one was expected to give thanks both to God and the ratepayers.

A few of the bodies of those who died in such institutions were claimed by relatives and given a decent funeral. The bodies of those with no known relatives - about 118 in the case of Eastville - were handed over to the medical profession for dissection.

Most, though, went into 'paupers' graves', buried at minimal expense. To save money, the Eastville Workhouse acquired its own burial ground, into which the mortal remains of 4,000 Bristolians were consigned with the minimum of respect.

Now, the story of the Eastville Workhouse and of those who lived and died there is all in a book recently published by the Bristol Radical History Group.

Researched and written by Roger Ball, Di Parkin and Steve Mills, *100 Fishponds Rd: Life and death in Victorian Workhouse* is the result of years of work, and is supplemented by online resources for those researching relatives who may have been buried there, and for those simply wanting to discover more.

This work also led to the memorial to the 4,000 dead who were otherwise forgotten. Carved by sculptor Matthew Billington using designs by pupils of the nearby May Park Primary School, the memorial was paid for by donations from the John James Bristol Foundation and the Greater Fishponds Neighbourhood Partnership, with contributions from other bodies and trade unions, and from Eastville residents themselves.

BT interviewed the authors of *100 Fishponds Rd*' who, good radical historians that they are, decided they would gave their answers collectively:

How did the project originate?

A few years ago when some of us from the Bristol Radical History Group (BRHG) were having a few beers in a house in Eastville and were studying an old Ordnance ***Survey*** map from 1902 (as historians do).

We were looking at the site of the old Eastville Workhouse at 100 Fishponds Road when we noticed a 'disused burial ground' marked. We set off with the map and tracked down the burial ground to Rosemary Green.

We looked for a memorial to the dead and found nothing. We then decided to research further. Who was buried in there? How many? And were they still there?

Once we had discovered that the paupers who were buried at Rosemary Green came from Eastville Workhouse, we felt that they deserved better and should be remembered.

Therefore, from the very beginning we were interested in naming them and raising a memorial to those buried there. We made contact with other local residents who were very positive about the project. The Eastville Workhouse Memorial Group (EWMG) grew out of this.

How did you go about researching it?

First of all we used the excellent Know Your Place website which confirmed that the burial ground was created after the workhouse was built in 1847. Then we headed down to the Bristol Record Office (BRO).

The staff (as always) were very helpful, but not hopeful. Most of the Poor Law Union records were held in St Peter's Hospital, which was hit by a bomb during an air raid in November 1940. However, they directed us to what records they did have, and ... Eureka! ... We found plans of Eastville workhouse and the deeds of consecration for the adjacent burial ground.

The BRO staff then pointed us to the registers of deaths at Eastville workhouse. We began the long process of transcribing by hand the names, ages at death, parish of origin and grave numbers which eventually took a couple of years. This information was later transferred into Excel spreadsheets and cross-checked by a team of researchers from Eastville and became the basis of the searchable ***data*** which can be found online at [*http://tinyurl.com/Eastville-burials*](http://tinyurl.com/Eastville-burials)

This resource is completely free (as it should be) and there is lots more information about the Eastville Workhouse project.

Once we had collated most of the burial ***data*** we turned our attention to the New Poor Law of 1834, the Clifton/Barton Regis Poor Law Union and Eastville Workhouse.

We were able to track down, with help from the staff at the Central Reference Library and the BRO, some half yearly accounts, maps and plans, ***census*** ***data***, photographs, medical inspection reports and health ***statistics***.

Also very useful was the comprehensive website workhouses.org.uk, run by Peter Higginbotham.

Crucial to our study of the management and daily life of the institution were newspaper articles.

From the 1860s, papers like the *Bristol Mercury* and *Western Daily Press* carried detailed reports of meetings of the Poor Law Guardians as well as numerous accounts of criminal cases involving paupers from the Eastville workhouse.

Finally, oral histories of local residents in Eastville have been very useful in understanding how important 100 Fishponds Rd was in the collective memory and what happened to the burial ground when the workhouse was demolished in 1972.

What were your most surprising/interesting/shocking findings?

Researching the Poor Laws and how they developed through history is pretty shocking in itself; from butchers like Henry VIII who reputedly executed 72,000 vagrants to the hundreds of impoverished farm labourers sentenced to death or transported after the Swing rising of 1830-31.

The subsequent New Poor Law of 1834 has been described by one famous historian as 'the most sustained attempt to impose an ideological dogma, in defiance of the evidence of human need, in English History'. We would go along with the sentiment of this statement.

The philosophy of the New Poor Law was to punish people for being poor, to make life in the workhouse harsher than the worst poverty on the outside in order to deter people from claiming 'relief' altogether.

This was in a period before proper welfare, pensions, asylums, orphanages, hospitals and universal healthcare. So it wasn't just the unemployed or underemployed; the elderly, infirm, sick, pregnant mothers, deserted children and people with mental illness and learning difficulties were forced into the workhouse if they did not have enough money to support themselves.

A father who was the sole breadwinner could have an industrial accident and as a result the whole family could end up in the workhouse.

On entering the institution families were split up and a gruelling regime of hard labour, poor food and punishment awaited the new arrivals.

Children in the workhouse were taken from their families and sent to work in abusive conditions in factories or just shipped off to work on farms in Canada or Australia.

Typically they were lost forever to their families and their roots in Bristol. Medical provision and sanitation in the workhouse was poor, to say the least, and the death rate was high.

Interment in the burial ground was functional with little ceremony, no markers on graves and vertical stacking of bodies to keep costs minimal. According to the records, unbaptised babies who died shortly after birth were buried outside the consecrated ground "under the wall".

They did not even make it into the pauper burial ground.

During Victoria's reign, Britain was the richest and most advanced industrial country in the world. Yet at its base was chronic poverty amongst millions of precarious working people and their dependents who created the wealth of the nation in the mines, fields and factories.

Eastville workhouse was full of factory, construction, ***agricultural*** and transport workers and domestic servants who were unemployed, underemployed, sick, injured, pregnant, elderly or infirm.

One of the most unexpected findings was that resistance to the punitive regime in Eastville Workhouse often came from young women and elderly men.

We discovered there had been a number of 'riots' instigated by teenage girls who smashed up wards and attacked the Master and senior staff. They were severely dealt with by the Poor Law Guardians and the magistrates who sent them to prison with hard labour.

There was no pensionable age in the Victorian period so workhouse inmates were literally worked until death. In one case a 90 year old man refused to go to work in the market gardens. As he was deemed by the Master to be a "bad influence" on the other paupers he was physically carried to work, where he sat down and flatly refused to dig. Through his protest the workhouse Master was advised by the Guardians not to order men of 90 to work!

Recent history also throws up its shocks. In 1972 the workhouse was demolished to make way for East Park Estate and May Park School. The burial ground was dug over by mechanical diggers and the "large bones"' that were uncovered were placed into 167 large boxes.

These were taken by Transit Vans and poured into a hole in Avonview Cemetery in St George. There was no attempt to deal with the bodies individually.

The smaller bones were just ploughed back into the ground at Rosemary Green and there is still no gravestone or any other memorial at Avonview to show who these thousands of people were.

Eastville Workhouse Memorial Group is currently asking the Bishops of Gloucester and Bristol to find the records of this re-interment and to sponsor a memorial at Avonview Cemetery to complement our efforts at Rosemary Green.

We strongly feel that all their parishioners should be treated with the same respect; rich or poor. We also feel that most of your readers will agree with this, and hopefully will have a word with their vicar on Sunday.

Have you had any comments from descendants of people who were interred at the burial ground?

We had a lot of interest and support from local people but also across the country and worldwide. Last year we held public meetings in the area and from these well attended gatherings Eastville Workhouse Memorial Group was born.

As we handed out leaflets we received lots of oral testimonies from those who remembered the institution and stories passed down through generations from those incarcerated within.

We began to realise that the words "100 Fishponds Road" still put fear into many elderly people despite the fact that Eastville workhouse was converted to an old people's home in 1948 as part of the new welfare state.

We displayed the project at a Family History day in 2014 and were touched by Wendy Bull's story in particular.

Wendy was researching her family history and came looking for the records of her great uncles and aunts. Her grandfather had been born in Eastville workhouse and survived. Our database showed that three of his sisters were less lucky, they all died in the institution and were buried in Rosemary Green.

She showed a photograph of her grandfather; it made us realise how close many of us are to not having been born, if our ancestors too had been amongst the dead.

When we released the Rosemary Green burial ***data*** online our website was inundated with over 3,000 people downloading the information.

Many people have searched the databases and found details of their relatives who were buried there, including some from Australia and Canada.

A couple of people even came forward with artefacts from when the workhouse was demolished in 1972.

For example, John Clevely, a child in 1972, found a cup in the rubble of the workhouse emblazoned with the Bristol Poor Law Union logo of a Beehive and the Latin motto: "They labour in summer mindful of the winter."

Do any (or all) of you plan to follow this project up with further research on Eastville, or by looking at other workhouses or pauper burials in the area?

According to workhouse expert Peter Higginbotham there are approximately one million unmarked pauper graves in the UK from nineteenth century workhouses. So there is plenty to do!

Rosemary Green is just one location where paupers from Eastville workhouse were buried; there were several more including Ridgeway Park Cemetery (near Eastville Park) and probably Greenbank Cemetery.

EWMG will continue to carry out research. However, this is not just work for us, but for all local and family historians in Bristol, who we would encourage to 'pick up the baton' for the forgotten in Victorian society.

There were a number of workhouses in the Bristol area and the Lunatic Asylum in Stapleton. Where did they bury their dead? Another area of interest we have is the number of pauper bodies given to medical schools for dissection. Where did these people end up?

BRHG will be publishing some further research work by Rosemary Caldicott on the Bedminster Union workhouse in Flax Bourton.

The pamphlet 'Bedminster Union Workhouse and Victorian Social Attitudes on Epilepsy: A Case study of the Life and Death of Hannah Wiltshire' offers a factual account of the life and death of the vulnerable poor living in rural England during the mid-nineteenth century.

This social history demonstrates how, without adequate social and medical support, a family unit fell apart.

Do you think the story of the Eastville burials has any lessons or resonances for today, or is this all about something that happened in the past and is now, as it were, dead and buried?

Whilst most of the events we studied took place over a hundred years ago, there are many links to the present. This has not been lost on our audiences, from church groups to Year 6 pupils at May Park Primary School.

There is currently a massive drive by the government to dismantle our welfare state and blame the poor and sick for being poor and sick.

The contemporary idea of the "deserving and undeserving poor" was originally created by Victorian anti-welfare crusaders in order to make cuts to poor relief.

These false philosophies were behind the Poor Law Amendment Act and the workhouse, as they are today behind cuts to tax credits, the 'bedroom tax' and benefit sanctions on the unemployed.

This is happening now, and if we are not vigilant we will lose the welfare state and see healthcare privatised; and the poor and sick will be dying of poverty again.

100 Fishponds Rd: Life and death in Victorian Workhouse by Steve Mills, Di Parkin and Roger Ball, price £7.50, is available mail-order from the Bristol Radical History Group ([*www.brh.org.uk*](http://www.brh.org.uk)) and Tangent Books (   [*www.tangentbooks.co.uk*](http://www.tangentbooks.co.uk)) websites, as well as at M Shed, the Bristol Record Office and some other local outlets.

**Load-Date:** December 14, 2015

**End of Document**



[***Rising prices: the high cost of living in 1916 Ireland; A recently published CSO survey paints a vivid picture of the cost of living in the country a century ago. Overall, today's consumers have it much better than those of yesteryear***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5JD7-KR91-DYS1-01KH-00000-00&context=1516831)

The Irish Times

March 28, 2016 Monday

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**Byline:** Conor Pope

**Body**

Grocery shopping in 1916 was a simple affair. There were no giant multinational supermarkets flogging flatscreen tellies and quinoa salad to a public bombarded with buy-me messages penned by latter-day Don Drapers. The notion that strawberries, raspberries or grapes could be bought year round (or ever) would have been as unimaginable as new potatoes in the winter.

Instead there were street markets, small shops and shopping lists made up of mutton, lard, "cheapest tea" and "second- grade margarine".

And exhaustive CSO project published earlier this month collates ***statistics*** to paint a picture of the Ireland of 1916. Much of the ***data*** is based on the 1911 ***census*** and other material that is as closely applicable to 1916 as possible.

"Things were very poor back then, so poverty jumps out at you [and] the lack of variety," says Helen Cahill, the CSO project's lead statistician "We have average prices of groceries that people bought. There was very little variety in food."

Ireland was predominantly an ***agricultural*** country and a place where a lot of milk was produced, but condensed milk was also commonly bought, largely because getting fresh milk from the country to the city was hard, and it was harder still to keep it fresh in the days before refrigeration.

Neither fish nor fowl were listed on the Consumer Price Index, suggesting that these modern-day staples were something of a treat back then.

According to the CSO figures, a pound of beef cost the equivalent of EUR 3.67 in today's money. Mutton, pork chops, pork sausages and bacon all cost EUR 4.90 a pound. Creamery butter was EUR 7.35. Cheese cost EUR 4.90 a pound and lard EUR 3.67. A quart of milk was EUR 1.22, a dozen eggs were EUR 4.90 and a 2lb loaf of white bread was EUR 1.22. A stone of "old" potatoes cost EUR 2.45 and the "best" tea was EUR 15.92, whereas the cheapest tea was EUR 9.79 a pound. White sugar cost EUR 1.22 a pound, and the same amount of jam was EUR 3.67.

Comparing prices then and now tells us how good we have it.

Just look at the price of eggs. In 21st century Ireland, there is a clear distinction between the cost of free-range, battery and organic eggs. A dozen of the cheapest costs EUR 1.99 in your local Tesco, whereas the free-range options are EUR 3.75. If you want your eggs organic, the price climbs to EUR 4. It is safe to assume that the eggs being sold in 1916 were pretty organic and free-range, but they were expensive compared even with the organic versions of today, and at EUR 4.90 cost almost twice the price of the cheapest eggs available in 2016.

At EUR 15.92 for the best tea, the drink most commonly associated with the Ireland of the Rising was not cheap. A pound of Barry's Gold Blend loose-leaf tea now costs just EUR 6.48, and 1lb of the cheapest own-brand option (sold in bags) can be bought for as little as EUR 1.75 or more than four times cheaper than the cheapest tea back then.

And then there was bread and butter. A pound of creamery butter cost EUR 7.35; farm-bought butter was slightly cheaper. A pound of own-brand butter today costs EUR 2.15; if you want to go with the market-leading brand, Kerrygold, you will pay EUR 2.95 - less than half the price it cost back then. A 2lb loaf of bread was EUR 1.22; the same amount of white (sliced) bread now will cost you as little as 99 cent.

Not only were prices higher, wages were much lower. A person in a good civil- service job would have been doing well to earn the 2016 equivalent of EUR 100 a week.

**Clothes**

At the most superficial level, the clothes being bought by Irish people ahead of Easter 1916 seem quite cheap, even if Patrick Pearse and Constance Markievicz didn't have Penneys, H&M or Zara to pop into in the run-up to the Rising.

CSO figures put a woman's heavy coat at EUR 188.57. A blouse was EUR 32.63, a skirt would have cost EUR 48.97 and a pair of boots EUR 68.57. A man's ready-made overcoat was EUR 209.39, whereas a tailor-made one would have set him back EUR 328.16. An off-the-peg suit was EUR 192 and a tailor-made one would have been EUR 360. Last week we rang Louis Copeland looking for a quote. He told us that a tailor-made suit would cost anywhere between EUR 750 and EUR 1,000, and we would not have much change out of EUR 500 if we wanted to buy a suit off the rack.

So were clothes cheap back then? Quite the opposite. The prices seem low but the wages were even lower. It would have taken a national- school teacher in 1916 one week to earn enough to cover the cost of a woman's heavy coat; the annual salary was a little shy of EUR 10,000. Today, a national-school teacher who has been working for 15 years will earn about EUR 42,500: enough to buy four heavy coats each week for a 1916 woman.

**Overall spending**

One of the most interesting things contained within the CSO figures is the percentage of income spent on a range of items. There is no information for 1916, but information from 1922 is enough to give us an idea of where the money was going back then.

In summer 1922, the Ministry of Economic Affairs sent 5,000 household budget forms to national-school teachers in every school in the country, who then distributed the forms to wage-earning households. Only 308 completed budgets, from 112 towns, were returned.

Householders were asked to detail the quantities and costs of all food consumed during the previous seven days, in addition to expenditure on fuel and light, household goods and cigarettes. They were also asked to give the cost of all clothing purchased over the previous year, and the cost of materials bought to make clothes.

Fifty per cent of the average household spend was on food and nonalcoholic drinks in 1922. Today that figure would be less than 12 per cent. Back then a further 17.5 per cent was spent on clothes, compared with about 6 per cent now. In total, 87 per cent of the average household spend in 1922 was on food, clothing, rent, fuel and light. Now we spend just over a quarter of our income on these categories.

Today's Consumer Price Index has weights for items that do not appear in 1922. Transport, restaurants and hotels, recreation and culture, health and communications did not feature back then.

An odd feature of the 1922 numbers is that alcohol is excluded entirely. The demon drink was also left out of the 1914 Cost of Living index for Great Britain and Ireland, which was designed to measure the cost of living for working-class households. Today, more than 2 per cent of our total spend is on alcohol.

There has also been a dramatic shift in the nature of housing. In 1911 just under 10 per cent of housing units had 10 or more rooms, with the percentage rising to more than 21 per cent in Dublin. Fewer than 3 per cent of Irish homes today can boast such space, and in Dublin only 1.6 per cent of homes have more than 10 rooms.

Although some people lived in big houses, many more lived in very small homes. In 2011, 36 per cent of dwellings in Dublin comprised just one room. Close to a quarter of those living in Dublin city in 1911 lived in a tenement.

Just under half of those who were employed in Ireland around the time of the Rising worked in ***agriculture***, compared with less than 5 per cent now. Just over a quarter worked in manufacturing, compared with just under 9 per cent now. One in 10 workers were domestic servants. Today less than 0.3 per cent of those at work are classified as such.

Just 8.8 per cent of the working population were classified as professionals then, compared with more than 40 per cent now. In 1911 the "commercial group of occupations", which included insurance, banking, transport and communications, and retail and wholesale trade comprised 5.6 per cent of the workforce.

In 2011, there were two groups that would cover broadly similar occupations - sales and commerce; and communication, warehouse and transport workers. Together this group made up for 21.5 per cent of the workforce.

**Transport**

The total number of cars in Ireland in 1915 was 9,850. Now there are about two million. A third of all the cars on Irish roads then were in Dublin. Longford had the lowest number of cars: 68.

Cork had 35 electric trams in 1901, whereas Dublin had 330 by 1911. The trams in Dublin operated on lines that ran 95.6km: 60km more than we have now. The city did not get its first bus route - the No 43 to Killester - until July 1925.

In 1916, there were more than 5,632km of railways on the island, transporting passengers and goods. Most of rural Ireland was within 10-12 miles of a local railway station. There were 964 train stations on the island in 1916. By 2014, there were 144 stations open in the Republic and just 2,384km of railways tracks.

**The macro picture**

In 1911 the government spent £11.5 million on the island of Ireland and raised £10.7 million in revenue, giving a deficit of about £0.8 million - or the price of a smallish house in a leafy Dublin suburb today.

By 1916 the overall fiscal situation in Ireland was great - for the British if not the Irish. The deficit of £0.8 million in 1911 (before the start of the first World War) had turned to a surplus of £5.3 million in 1915 (one year after the start of the war).

By 1916 nearly £24 million was raised in Ireland by the British government, but just over half of this, £12.6 million, was spent here, giving a surplus of more than £11 million towards the war effort in Britain.

Taxes on imported goods such as tea, sugar and tobacco, and increased duties on alcoholic products, as well as a lowering of the exemption limit for income tax, contributed to the large increase in government revenue between 1913 and 1916.

Total revenue collected by the British Government in 1916 was £564.7 million. Revenue raised in Ireland accounted for about 4 per cent of this.

**A pretty penny The Irish Times on this day in 1916**

It would be remiss of us to talk about products, pricing and the life lived by Irish consumers in 1916 without looking inwards, at least briefly.

On this day in 1916, *The Irish Times* cost a penny. Yep, one bright, shiny penny. That might seem ridiculously cheap compared with today's prices, but to put the penny in perspective, a pint of Guinness would have cost you six times that price.

And the newspaper back then was nowhere near as snazzy as it is today. As was common at the time, our front page was given over entirely to classified advertising. Money-lending was big business.

The English and Scottish Law Life Company on Sackville Street (now O'Connell Street) was promising loans to anyone with a life-assurance policy. On Marlborough Street, the First Class Money Office was looking for people to pawn their silverware, promising the best rates. D Cowan on Drury Street was offering loans of up to £500 to farmers, shopkeepers, doctors, ladies, gentlemen and all respectable applicants on a simple promissory note ad. Private Finance would lend as much as £5,000 "on note of hand alone to Ladies and Gentlemen without any security or interview".

Rescotts was promising to make our readers' furs as good as new, and several car dealers were advertising cars for a pretty hefty £300.

You could have travelled to Liverpool on the Tedcastle Line for just 3 and sixpence - although that would have been steerage, and if you wanted a cabin it would have cost you eight shillings.

The Spa Hotel in Lucan was selling itself as the "best inland health resort in Ireland". Its air, we were told, was "famed for its purity and health-restoring properties". Nothing much has changed there, then.

Then there was the lost-and-found section, although to be honest it was more of a lost section. Someone had mislaid a set of keys on the balcony of the Kingstown Railway Station and they really, really wanted them back. The loser was willing to offer a five-shilling reward for their safe return. Also lost were two fox-fur muffs - one on a tram in Donnybrook and another near Merrion Square - a gold-rimmed pince-nez had been misplaced in Dublin and an Aberdeen terrier called Howard had also gone missing from the same area.

**Load-Date:** March 27, 2016

**End of Document**



[***Oman's increasing domestic production in agriculture and fisheries to reduce imports***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5WS6-C4N1-DXYV-7452-00000-00&context=1516831)

Oxford Business Group: Articles

February 2016

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**Length:** 3276 words

**Body**

The sultanate has ambitious plans to expand production and capabilities in ***agriculture*** and fisheries, building up the sector as a contributor to the economy, a key employer and a source of export earnings. Its strategy is based on concrete developments, including supporting new companies that can boost production of dairy, produce, poultry and meat. Building on millennia of tradition in fishing, Oman is also developing its aquaculture sector, which is seen as a potentially major magnet for investment and a key export earner over the long term. Oman's Vision 2020 sets the target of raising ***agriculture***'s contribution to GDP to 3.1% by 2020, with annual growth topping 4.5%. It also intends to boost the fishing sector to around 2% of GDP by 2020, with growth of 5.6% per annum. The government has the dual aims of reducing Oman's dependence on imported ***agricultural*** produce and increasing exports where possible.

**Counting Up**

Oman's ***agriculture*** sector was worth 0.7% of GDP in 2014, according to the National Centre for ***Statistics*** and Information (NCSI), totalling OR224.1m ($580.2m), up 7.3% on OR208.9m ($540.8m) in 2013. The sector grew by 4.8% in 2013, following a 2.5% drop in 2012. The Central Bank of Oman (CBO) calculated that the ***agriculture*** and fisheries sectors together generated a combined OR406.1m ($1.05bn) in 2014, up 9.4% at current prices from OR371.2m ($961.04m) in 2013, when the sectors grew by a collective 8.7%. The CBO's current price figures indicate steady and consistent growth over recent years, from OR311.7m ($807m) in 2010.

Public spending on ***agriculture***, forestry and fishing rose 29.8% from OR48m ($124.3m) in 2013 to OR62.3m ($161.3m) in 2014, and almost twice the OR33.2m ($85.9m) allocated in 2010. The rapid increase in expenditure on the sector, even at a time when the sultanate has had other pressures on its budget, is indicative of the importance that the government places on ***agriculture***.

Meanwhile, commercial credit extended to ***agriculture*** and related sectors reached OR53.8m ($139.3m) in 2014, up from OR45.6m ($118.05m) the previous year. Accessing private credit is often a challenge for farmers, particularly in emerging markets, so growth is a positive sign of banks' confidence in the ***agriculture*** sector.

The last ***agriculture*** ***census*** carried out by the Ministry of ***Agriculture*** and Fisheries (MAF) for 2012-13 has helped policy planners and researchers, providing ***data*** that could underpin long-term strategies for development.

The ***census*** found that Oman's overall livestock herd had increased by 39% since the last ***survey*** in 2004-05. It also revealed that the area dedicated to aquaculture ponds rose 479% over the same period, albeit from a relatively low base, from 0.57 ha to 3.28 ha. Vegetable plantations grew by 125% in terms of area, from 4964 ha to 11,159 ha.

**Crops, Fruit & Vegetables**

Total ***agricultural*** production - as classified by the NCSI to include vegetables, fruit, field crops and perennial fodder crops, without livestock or fisheries - reached 1.5m tonnes in 2014, up from 1.3m tonnes in 2013 and 1.2m tonnes in 2012. The largest contribution to production was made by perennial fodder crops with 753,600 tonnes from 19,300 ha, followed by fruit at 404,400 tonnes from 29,700 ha, vegetables with 334,600 tonnes from 12,600 ha and field crops at 22,200 tonnes from 4660 ha.

Production of fruit, vegetables and perennial fodder crops has grown over recent years, while that of field crops has dropped, perhaps reflecting a policy focus on those areas of ***agriculture*** in which Oman has competitive advantages. In 2013 production of vegetables reached 236,700 tonnes, fruit totalled 378,700 tonnes, field crops rose to 25,000 tonnes and perennial fodder crops grew to 745,900 tonnes. The respective figures for 2012 were 193,100, 350,600, 46,000 and 658,100 tonnes. The total area under cultivation for ***agriculture*** in Oman has fluctuated somewhat in recent years, rising slightly from around 66,000 ha in 2013 to 66,400 ha in 2014, down slightly from a recent peak of 73,200 ha in 2011 and up slightly over the decade from 61,100 ha for both 2005 and 2006. Until 2014, the recent peak of production was 1.5m tonnes in 2010.

**National Priority**

The development of ***agriculture*** and fisheries is a central priority of the Eighth Five-Year Plan, which runs between 2011 and 2015. The rationale behind promoting the sector is both to enhance food security in a country that imports much of its food and to boost employment levels in rural areas, focusing on expanding job opportunities for Omanis.

To this end, the government has identified several measures it can take to promote growth and diversification, including allocating more public investment, development of new markets, improving product marketing and providing product-specific support for ***agricultural*** producers. The sultanate has also adopted a strategy and goal for 2040, developed in cooperation with the UN Food and ***Agriculture*** Organisation (FAO). It seeks to ensure optimum use of ***agricultural*** and maritime resources by developing value chains, enhancing food security, creating jobs, and improving the competitiveness of Omani products in international and domestic markets.

**Livestock**

In 2014 Oman had 366,700 cattle, up from 359,500 in 2013, according to the NCSI, while its sheep herd grew from 548,200 to 559,200 over the same period. The number of camels used for meat and milk rose from 242,900 in 2013 to 247,700 just one year later, while Oman's goat herd, also used for meat and milk, reached 2.1m in 2014, up from 2.09m in 2013.

Red meat production in 2014 totalled 42,000 tonnes, up slightly from 41,000 tonnes in 2013 and a major jump over 25,000 tonnes in 2012. Dairy products totalled 91,000 tonnes in 2014, up from 89,000 tonnes and 72,000 tonnes in 2013 and 2012, respectively. Poultry production came to 43,000 tonnes, up slightly from 42,000 tonnes in both 2013 and 2012. Egg production has remained steady, at 236m, for each of the past three years.

**Water**

In Oman's predominantly dry climate the preservation and efficient use of water is a priority. In July 2015 the Ministry of Regional Municipalities and Water Resources announced plans to introduce smart meters for projects requiring substantial amounts of water, including large farms. Saleh Mohammed Al Shanfari, chairman of A'Saffa Foods, told OBG, "New investments and projects in the sector must be designed with scarcity in mind. Planning around these constraints is crucial to a project's success and commercial viability." This goes hand-in-hand with efforts to reduce the production of crops that are water-intensive and focus on those that use less water. The new smart meters will collect real-time ***data*** on usage and track consumption remotely, which will help the government learn more about demand patterns. The meters will also be pre-programmed to pump a certain amount of water, encouraging farmers to irrigate only in the mornings and evenings, when evaporation rates are lowest. This programme is part of a broader government policy of adapting modern and efficient irrigation methods, cutting down on wasteful flood irrigation.

**Fisheries**

The sultanate has a strategic plan to develop fisheries that runs from 2013 to 2020, the National Fisheries Development Strategy, which aims to enhance production, increase the industry's efficiency and protect natural resources. Priorities include ensuring a safe supply of fish for local demand, improving use of fish reserves, and encouraging private investment in maritime and aquaculture industries. The sector has been growing strongly for some years as the sultanate has moved to better capitalise on its long coastline and extensive territorial waters. In 2014 Oman landed 211,315 tonnes of fish, up from 206,517 in 2013, 191,728 in 2012 and 158,722 in 2011, according to the NCSI. Production has risen greatly from 120,421 tonnes at the turn of the century.

The growth of the fishing industry has seen the number of new commercial fishing licences issued reach several thousand a year, peaking in 2009, when 4952 new licences were granted. The number of new licences has since declined, with 1621 issued in 2014, while 6540 were renewed. The sultanate exports roughly 35-45% of its fish, though both volumes and the value of sales fluctuate considerably. In 2014 it exported 77,645 tonnes of fish worth OR52.5m ($135.9m), while in 2013 exports totalled 95,573 tonnes worth OR50.8m ($131.5m),and in 2012 they amounted to 72,237 tonnes worth OR55.8m ($144.5m).

The trend has been broadly upward over the last decade: in 2005 Oman exported around 51,000 tonnes of fish, earning OR37.3m ($96.6m). The five major export species by value in 2012 were sardines, emperor fish, Indian mackerel, sea bream and cuttlefish, according to the MAF's Directorate of Aquaculture Development.

**Aquaculture Potential**

Aquaculture is a fledgling industry in Oman, with 350 tonnes of shrimp produced in 2013, according to a 2015 report by the directorate titled "Investment Guidelines for Aquaculture Development in the Sultanate of Oman". However, drawing on research undertaken in recent years, the report estimated that by 2030-40, the country could be producing up to 220,000 tonnes from aquaculture, generating $900m directly and with a cascaded contribution of $2bn to GDP. Fish farming is seen as an area in which the broader ***agriculture*** and fisheries sector has the most potential for exports. The segment contributes up to 60% of all fish produced for human consumption, according to the directorate, with the proportion expected to increase as wild sea and freshwater stocks decline.

In 2007 the MAF initiated a process of developing aquaculture by working with the UNFAO to draft a national strategic plan for the sector, which the ministry has since developed, modernising legislation, coordinating with other government agencies with interests in the industry and working with international experts to identify potential fish farming projects.

The result is a range of investment incentives that are intended to enhance Oman's competitive advantages as a destination for aquaculture development, complementing its favourable climate and geographical location. Foreign investors can apply for five-year corporate tax and Customs duty holidays, extendable for a further five years. In addition to this, projects undertaken by companies with at least a 30% stake held by Omani nationals may also be eligible for soft loans from the Oman Development Bank. Omani nationals are eligible for government funding of up to 80% of the cost of fish feed, fingerings (young fish) and equipment, including fish tanks.

**OFIC**

One of the leading organisations driving ***agricultural*** development, and a key partner for investors, is Oman Food Investment Holding Company (OFIC). Founded in 2012, OFIC is a state-owned enterprise that seeks to promote investments in the food sector to benefit the country.

"The aim is to enhance Oman's food security and support economic development and diversification by investing in food projects at home and abroad in partnership with companies in the sector, other investors and stakeholders," Saleh Al Shanfari, CEO of OFIC told OBG. OFIC sees the financial support of the government, as well as the company's growing talent pool and clear strategy, as competitive advantages that will be appreciated by potential partners.

Its broader aim is to enhance Oman's food security and export potential via a stronger food industry, which will entail bringing in new capital and expertise to leverage the sultanate's resources and location. OFIC has three main areas in which it aims to deliver on this. First, a key goal will be forging partnerships with food companies and other stakeholders to invest in domestic and international food production projects. Second, the company will provide guidance and support to management for early-stage projects, but with minimal operational participation over the longer term. OFIC does not intend to become a monolithic state-owned food producer. Third, it will operate a holding company to manage the sultanate's investment stakes in the food industry and manage its long-term financial well-being.

Beyond these aims, OFIC has a range of objectives, such as finding commercially viable projects in Oman and elsewhere that offer the sultanate both strategic and financial advantages, while having a clear exit plan. The company will develop partnerships with private and public companies and institutions in order to bring more investment into the food sector. OFIC will also support the adoption of responsible, sustainable and efficient practices across the value chain. The company will select agri-food projects in both rural and urban areas to create jobs, boost economic diversification, and foster the growth of small and medium-sized enterprises, which make up a substantial part of the sector, as well as collaborating with ***agricultural*** collectives. Improving food quality standards through adoption of established international practices will also be key, and will allow Oman to leverage its geographical advantages to make it a hub of quality food production. Finally, OFIC aims to become a centre of excellence for integrated agri-food solutions in the Gulf region.

**Activities**

OFIC aims to participate in companies and projects to different degrees at three stages of development: active management of start-ups, strategic management by the holding company of projects needing guidance without operational decision-making, and a long-term minority strategic investor in more mature companies. In the latter case, the holding company will focus on portfolio performance, according to S V Uppiliappan, CFO and Investment Manger of OFIC.

The company divides its operations into core and non-core activities. Core activities include: commercially viable projects that present high investor appetite in the poultry, red meat and dairy industries; projects that need government support, such as marketing, milk collection and processing; and short-term investments through a food sector private equity fund. Non-core activities include: establishing a commodity trading and management platform; setting up a fisheries and agribusiness logistics centre; investing in aquaculture; producing commodities such as rice, wheat, corn, soybean and sugar; and creating a programme for food safety labs.

**Lead Projects**

As of November 2015, OFIC was in the process of developing three projects in red meat production, poultry farming and dairy. In June 2015 the company announced the establishment of the Anaama Poultry Company, a poultry project with OR100m ($258.9m) in initial capital, 50% of which is debt and 50% equity. OFIC holds 20% in the project and has a seat on the management board, with the remaining shares held by institutional investors. The company is expected to produce 60,000 tonnes of poultry meat a year by 2020 from a site near Ibri in north-west Oman.

As of late 2015, Anaama was already operational. Combined with existing producers, the project is expected to ensure that Oman covers 70% of its poultry needs from domestic production by 2030, up from 36% at present. OFIC expects to engage partners across the project development cycle, including supplying equipment, construction, retailing and distribution, boosting job creation in a number of sectors.

**Milk**

OFIC's second project is Mazoon Dairy. Mazoon also has a 50:50 debt/equity mix and start-up capital of OR100m ($258.9m), with OFIC taking a 20% stake. The vertically integrated farm will start with around 4000 cows in 2017, with a target of a 25,000-strong herd by 2026.

The project launched in 2015, with Mazoon Dairy already operational and planning to scale up substantially. Mazoon has a target of producing 202m litres of milk by 2026 and 985m by 2040. Combined with increases in output from other producers, and a new milk collection scheme being devised by OFIC, this should cut milk imports from 69% of consumption in 2014 to 13% in 2026. It is estimated that by 2040, Oman could be a net exporter of milk, although the domestic market is forecast to continue growing over the next decade.

**Meat**

A third major project involves producing red meat and was expected to launch in December 2015. The aim is to improve Oman's control over its red meat supply by investments in Omani-controlled farms and production facilities both domestically and in Africa. Currently, Oman controls 20% of its red meat supply, while OFIC's target is to increase this to 52% through investments in farms, ranches, slaughterhouses, and storage and packing facilities, producing 55,000 tonnes of red meat a year. Saleh Al Shanfari, OFIC's CEO, told OBG that feed for all three projects would be imported in order to preserve domestic water resources and that the sites for the three farms had been chosen so as to make importing a straightforward affair. Suppliers from the Americas, Europe and Africa have already expressed their interest, with OFIC aiming to ensure that companies active in Oman participate. Pricing and marketing strategies are also being crafted by carrying out feasibility studies, taking into account the need to develop supply chains. "We are looking to build companies that will ensure food security, develop economies of scale to compete globally and meet social requirements," Al Shanfari said.

**Marketing Companies**

The MAF is also working with OFIC to develop three separate agencies to improve the processing and marketing of fruit and vegetables, dates and livestock. According to OFIC, Oman has 8m date palm trees, but could do more to drive up standards, strengthen exports and improve competitiveness more broadly.

A consultant has been appointed to develop a feasibility study for the date agency. Oman produced 308,000 tonnes of dates in 2013, up from 281,000 tonnes in 2012, according to the MAF, though it only exported 7000 tonnes. As dates are a higher-value product, Oman could generate significantly more in export earnings from its crop, giving growers cause for optimism.

The second organisation will be a marketing company for the fruit and vegetables sector, to an extent filling the gap left by the 2000 closure of the Public Authority for Marketing ***Agricultural*** Produce. The company will operate on a commercial basis, with government support, establishing procurement centres to pack and grade produce in selected regions, particularly Batinah. Officials told the local press that it will handle crops including tomatoes and cucumbers, and that the company will build infrastructure such as cold storage, warehousing and transport facilities.

The third project will focus on improving the processing of milk and dovetails with the development of Mazoon. It foresees the development of a milk processing plant in the Dhofar region, where as much as 70% of Oman's livestock herd is located. Six collection centres will feed into the plant. The company intends to process 90,000 tonnes of milk per year and launch by 2017. The MAF aims to raise milk yields through a range of schemes, including by improving farmers' knowledge of breeding higher-yielding animals.

**Outlook**

Oman's goals for developing ***agriculture*** and fisheries are ambitious, but they are based on solid plans for long-term growth. OFIC will take the lead in livestock-related farming, and is already making significant progress in that sphere. The company's projects will create opportunities for private sector and international partners in financing, supply, management, logistics, and downstream distribution and retail, among other high-growth areas. This increased investment capitalises on Oman's natural advantages.

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[***Employment relations and growing income inequality: Causes and potential options for its reversal***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:6BM3-69X1-DY41-72XH-00000-00&context=1516831)

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**ABSTRACT**

The growth of income inequality is now recognized to be one of the most important developments in employment relations of our time. While inequality has increased in many parts of the world, it has been most pronounced in the United States. We review the factors that have been suggested to cause the growth in inequality and, given these multiple causes, suggest a set of actions that might begin to reverse this trend. We give special attention to the changes in the employment relationship related to labor market institutions – including unions and other forms of worker representation, wage regulations and enforcement, and safety net policy – while also accounting for explanations and proposals that focus on technology, skills and education, and globalization. Additionally, we argue that emerging forms of organizational restructuring are becoming increasingly important to the study of inequality and its remedies.

**FULL TEXT**

**Introduction**

The growth of income inequality is now recognized to be one of the most important developments in employment relations of our time. While inequality has increased in many parts of the world, it has been most pronounced in the United States. In this article, we will review the factors that are suggested to cause the growth in inequality and, given these multiple causes, suggest a set of actions that might begin its reversal, with particular emphasis on the employment relationship and labor market institutions. While we focus mostly on the US, we place the discussion in a broader global context.

**Trends in inequality in the US**

The most widely used indicators of the growth in income inequality in the US come from Piketty and Saez (2013). Using detailed tax ***data*** from the US Internal Revenue Service, the authors show a remarkable pattern of income transfer – of over 15% of national aggregate income – from the bottom 90% of the income distribution to the top 10% over the past three decades (Figure 1). Even within the top decile of the income distribution, it is the top 1% that realized disproportionate gains, accounting for almost 60% of income growth between 1976 and 2007. In contrast, income growth of the bottom 90th percentile was relatively flat (Figure 2). Figure 1.Top decile income share in the United States, 1917–2014. *Source*: Piketty and Saez (2007 [2015]).Figure 2.Decomposing the top decile US income shares into three groups, 1917–2014. *Source*: Piketty and Saez (2007 [2015]).

A second widely used indicator focuses specifically on long-term trends in compensation and labor productivity (Figure 3). For three decades following World War II real compensation (wages and fringe benefit costs) moved roughly in tandem with productivity. From 1979 to 2014, however, productivity grew by approximately 63%, while real compensation for hourly workers in the US increased by only about 8% – meaning productivity increased about eight times faster than wages and benefits despite the rise in workers’ education levels during this period. Figure 3.The growing gap between productivity and workers’ hourly compensation, 1948–2014. *Source*: Economic Policy Institute analysis of ***data*** from Bureau of Economic Analysis' National Income and Product Accounts and the Bureau of Labor ***Statistics***' Consumer Price Indexes and Labor and Productivity Costs (Bivens and Mishel, 2015).

A third indicator of growing inequality is the shift in labor’s share of national income. Since 1970, labor income share has declined overall, even when accounting for income sources such as health and pension benefits. Labor share measured by salary and wages only has deteriorated more sharply, falling nearly nine percentage points over this period (Figure 4). Figure 4.Declining shares of labor compensation and wages, 1955–2014. *Note*: Compensation includes all forms of remuneration, including wages and salaries and employer contributions (to employee pension and insurance funds, as well as government social programs). Wages and salaries do not include any such contributions. *Source*: US Bureau of Economic Analysis, Table 1.12: National Income by Type of Income. Last revised: October 29, 2015.

The shift from labor- to capital-intensive industries is part of the reason for this shift, but also important is the growing decline of labor share within industries – especially those where profits have grown tremendously, such as in finance (International Labour Organization (ILO), 2015) and the simultaneous accumulation of capital income by the very top of wage earners.

**Global trends in inequality**

The US is not alone in experiencing growing inequality over recent decades. Many industrialized countries – such as Japan, Canada, and those in Europe – have followed a similar trajectory. In particular, dramatic growth patterns at the very top are observed in other English-speaking countries such as the United Kingdom and Canada, although to a lesser degree, while in other countries such as Japan and those in Europe such accumulation is not as pronounced (Alvaredo et al., 2013). Scholars attribute these observations to a convergence in labor market institutions in countries such as the US and the UK – the decline of collecting bargaining, for example, or the declining real value of minimum wages (Gosling and Lemieux, 2004) – but also point to significant change in bargaining among CEOs and other top executives in large companies (Bivens and Mishel, 2015). Still, there is concern that as countries seek to mimic US-style compensation structures and labor market policies, their patterns of inequality will become more closely aligned with that of the US, as has been the experience in the UK (Gosling and Lemieux, 2004). Although these concerns are widespread across countries, we focus here on the causes and consequences of wage inequality in relation to the employment relationship in the US, as it is the country with the most extreme growth in inequality and the one for which we have the most expertise. (It is important to note that here we focus primarily on income inequality due to wage inequality, not other sources such as differences in property ownership and capital income. Wages account for approximately 80% of total income in the US and 70% in Europe (ILO, 2015).)

**Explanations for income inequality**

Not surprisingly, the growth in inequality has gained significant attention and been the source of considerable debate among researchers from multiple disciplines. We review the evidence generated by this research in the following, starting with traditional explanations in economics focused on the external market and technological change before turning to institutional and organizational factors that arise from various disciplines. In so doing, we aim to arrive at an explanation of inequality that reflects the fundamental ways in which the organization of the employment relationship has changed.

**Skill-biased technological change**

One of the first factors economists turned to in explaining inequality is skilled-biased technological change (SBTC), in which inequality is posited to rise when new technologies generate demand for highly-skilled workers (Card and DiNardo, 2002). This rise in inequality is argued to occur in two ways: first, through demand for skilled workers who are needed to fill more technologically advanced jobs yet who are in short supply, and later, by the displacement of lower- and middle-skilled workers, which intensifies competition for lower-wage jobs (Autor, 2010; Autor et al., 2008).

The increase in the college-to-high-school wage premium in the 1980s was the first indicator that led researchers to examine this issue in detail. In 1980, this premium was 39%; by 1990, it had risen to 54%. However, during the 1990s, the growth in the college-to-high-school differential slowed and stood at 61% by 2000, where it approximately remains today (Goldin and Katz, 2008; James, 2012). This stagnation, along with the failure to explain differences in educational returns by demographic factors such as age, gender, or race, led a number of scholars to critique the theory of SBTC as incomplete at best (Card and DiNardo, 2002; Lemieux, 2008).

Still, however, the debate around SBTC persists. Current arguments regarding SBTC have shifted focus from skills measured by education to the changing composition of tasks in technologically changed work (Acemoglu and Autor, 2011). This emphasis led to the emergence of the ‘job polarization’ thesis: namely, that a ‘hollowing out’ of middle-skill jobs is occurring at the same time that jobs characterized by low- and high-skill levels (and corresponding low- and high-wage levels) are growing (Autor, 2010). Empirical evidence challenges this idea: Holzer (2010), for example, finds that middle-skilled jobs in the US are actually projected to *grow* in the near future. Others argue that the job change patterns in the most recent decade fail to reflect the job polarization thesis, notably as job growth in low-wage sectors has outstripped that of high-wage sectors throughout the 2000s. Using a comparative perspective across various countries, still others show that institutions affect the degree to which the job polarization hypothesis bears out (Fernandez-Macias, 2012).

**Globalization**

The next favorite explanation was globalization and the related decline of the American manufacturing sector: since 1980, the US has lost just over one-third of its manufacturing jobs. A number of studies have shown that workers displaced from manufacturing jobs who regain employment experience wage reductions of 20% or more (Holzer et al., 2011: 125). A different study documents numerous negative effects – declining wages, significant increases in income transfer payments, higher unemployment, and larger reductions in labor force participation – experienced in communities exposed to increased import competition from China (Autor et al., 2013). These community effects are more persistent than economic theory would predict: the same study found relatively little geographic mobility among those displaced. More recently, offshoring undertaken by US firms during the 2002–2008 period has been shown to advantage higher-skilled (and higher-paid) workers who undertake relatively more abstract and communication-dependent tasks in their jobs (Oldenski, 2014).

**Composition of the labor supply**

Finally, we briefly note that growing inequality is also attributed to the changing demographic composition of the labor supply. These arguments primarily revolve around gender, immigration, or education levels – the influx of women, for example, or immigrants into certain sectors is argued to drive down wage levels. Research has challenged such findings (Lemieux, 2008), while also situating the disparity in outcomes among different demographic groups in the context of labor market institutions, as described more fully in the next section.

**Labor market institutions**

Scholars in various disciplines have established linkages between labor market institutions – such as wage laws, labor unions, and regulatory regimes – and patterns of growing wage inequality. Below, we review the main labor market institutions that we deem important to understanding inequality.

**Minimum wages**

The first institutional feature thoroughly examined was the decline in purchasing power of the national minimum wage. The current US$7.25 per hour federal minimum stands at about 25% below the purchasing power of the minimum wage at its peak in 1968, which, had it kept up with inflation, would currently stand at approximately US$10.94 per hour.

The decline of the federal minimum wage’s real value is particularly deleterious to those at the bottom of the wage distribution – historically, this has been especially so for women, who were less likely to be employed in unionized industries upon their entrance to the labor market in the 1980s (DiNardo et al., 1996; Lee, 1999; Lemieux, 1993). Fortin and Lemieux (1997) estimate that had the real value of the minimum wage in 1979 been maintained in 1988, the variance in female log wages would have increased by 32.1% *less* than it actually did, compared to the 24.2% lesser increase in men’s wage dispersion under the same conditions. These trends changed markedly during the 1990s and 2000s, when explosive growth of top incomes became the primary driver of disparity in income (Lemieux, 2008). Even so, the minimum wage is still an important institutional feature affecting inequality, particularly among those at the bottom of the US wage distribution.

**Decline in unions and bargaining power**

More recently, scholars have recognized that decline in unions and worker bargaining power account for a sizable portion of the problem. By 1980, union membership had been declining slowly for two decades, and international competition was eating away at unionized manufacturing firms. Membership’s abrupt and steep decline in the early 1980s – initiated by the Federal Reserve’s efforts to break the back of rampant inflation; a harder management line against unions, signaled by President Reagan’s firing of striking air traffic controllers; a deep recession; and the growth of non-union domestic competition – persisted for the following three decades.

Tables 1 and 2 report previously unpublished ***data*** from research regarding the changes in industrial relations in the 1980s (Kochan et al., 1986). Specifically, we show that collective bargaining outcomes changed after 1980 due to a decline in the power derived from strikes, centralized bargaining, and informal pattern bargaining arrangements that spread negotiated wage settlements within local labor markets and industries. The analysis is based on regressions on wage changes negotiated in collective bargaining units in manufacturing firms with 1000 or more employees from 1957 to 1984. As Table 1 shows, prior to 1980, the coefficients on strikes, centralized (firm-wide rather than single plant-level) negotiations and regional and intra-industry pattern bargaining were positive and significant. In contrast, from 1980 to 1984 (the last year these ***data*** were collected), the coefficients are mostly either insignificant or negative. Table 1.Wage change regressions: 1957–1984.

|  | **Full sample** | **Pre-1980** | **Post-1980** |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Multi-plant, single firm structures | .0039\*\* (.0012) | .0037\*\* (.0012) | .0058\*\* (.0012) | .0055\*\* (.0012) | −.0067 (.0038) | −.0067 (.0039) |
| Multi-firm structures | .0042\*\* (.0013) | .0043\*\* (.0014) | .0046\*\* (.0014) | .0046\*\* (.0014) | .0031 (.0043) | .0028 (.0043) |
| Region-wide pattern bargaining | .0046\*\* (.0013) | .0050\*\* (.0014) | .0036\*\* (.0014) | .0039\*\* (.0014) | .0085\* (.0043) | .0090\* (.0043) |
| Industry-wide pattern bargaining | .0045\*\* (.0014) | .0046\*\* (.0014) | .0043\*\* (.0015) | .0042\*\* (.0014) | .0057 (.0046) | .0063 (.0046) |
| Strike 1–14 days |  | .0075\* (.0031) |  | .0080\*\* (.0030) |  | .0039 (.0157) |
| Strike 15–24 days |  | .0054 (.0046) |  | .0020 (.0046) |  | .0164 (.0158) |
| Strike 25 or more days |  | .0052\*\* (.0019) |  | .0060\*\* (.0019) |  | −.0029 (.0072) |
| R2 | .50 | .50 | .55 | .55 | .31 | .30 |

All equations in Tables 1 and 2 contain controls for changes in rates of inflation, employment growth/decline, unemployment and presence/absence of wage and price guidelines or controls. Standard errors in parentheses.*Note*: \**p* < 0.05; \*\**p* < 0.01; \*\*\**p* < 0.001.Table 2.Over-predictions of post-1980 wage changes using pre-1980 model.

| **Structure/pattern cell** | **N** | **Without strikes (%)** | **With strikes (%)** |
| --- | --- | --- | --- |
| Overall sample | 414 | 1.35 | 1.36 |
| Single plant | 169 | 0.79 | 0.83 |
| Multi plant/single firm | 163 | 2.10 | 2.09 |
| Multi-firm | 82 | 0.94 | 0.96 |
| No pattern | 83 | 1.20 | 1.24 |
| Regional pattern | 162 | 0.89 | 0.90 |
| Industry pattern | 169 | 1.85 | 1.83 |

The ***data*** in Table 2 show that overall, the model of wage determination under collective bargaining that dominated in the 1957–1979 time period over-predicted wage settlements in the early 1980s by 1.35% and, consistent with the results shown in Table 1, over-predicted wage changes more in units with centralized bargaining structures and intra-industry pattern bargaining traditions. Thus, the key sources of power that unions used to increase wages and spread these gains within industries had declined. This decline is substantial: extrapolating from these findings, if the magnitude of these wage outcomes persisted in bargaining, the 1.35% estimate would account for nearly 20% of the difference in growth of productivity and wages from 1980 through 2015. Although imprecise, this is in the same range as more recent studies of the effects of union decline.

Similarly, Erickson (1992, 1996) documents the demise in the 1980s of specific union contract clauses that had helped maintain pattern bargaining within and across the aerospace, automobile, and ***agricultural*** implement industries. Freeman (1980, 1982) also shows that leading up to the 1980s, unions played an important role in reducing wage inequality within organizations, finding that the dispersion of wages within unionized organizations of different industries ranged from 5% to 50% lower than that found within non-unionized organizations.

Using more recent ***data***, Western and Rosenfeld (2011) estimate the decline in unionization accounts for as much as 20% to 30% of the rise in wage inequality since the 1980s. The impact is strongest among less educated and blue collar men – a group for whom unions reduced inequality prior to the 1980s by mitigating the deleterious effects of a falling minimum wage (Freeman, 1993; Western and Rosenfeld, 2011).

**Deteriorating labor enforcement regimes and safety net**

The absence of unions has yet a different effect in low-wage sectors, where they have traditionally acted as a deterrent against wage theft and other labor standards violations that contribute to inequality (Wright and Brown, 2013). A 2008 ***survey*** of over 4000 low-wage workers in the cities of Chicago, Los Angeles, and New York found that approximately 67.5% of respondents – who worked in non-union car washes, retail and food service, and domestic work, among other sectors – faced wage reductions through violations in the prior week. These included underpayment of wages, lack of overtime pay, or working off the clock, and cost them nearly US$3000 in wages over a year of full-time work (Bernhardt et al., 2013).

Compounding the problem is weakened enforcement capacity of the state, an issue that has been observed in many countries (ILO, 2006). In the US, the number of workers and establishments covered by the Fair Labor Standards Act has risen steadily over the last two decades, yet the number of inspectors in the Department of Labor has simultaneously declined (Weil, 2014). Enforcement of wage standards is also hindered by the fact that 70% of wage and hour investigations result from worker complaints (Weil, 2008), even though evidence suggests there is a mismatch between industries where complaints are made and where violations are most commonplace (Weil and Pyles, 2005).

US social policy relevant to the safety net – as measured by social insurance and the payroll and income tax systems, both of which grant access to safety net programs through employment – is the weakest among Organization for Economic Co-operation and Development (OECD) countries. By 2000, the US was spending the least among this group in income transfers and cash social transfers for the non-elderly (Smeeding, 2005). These weak safety net programs indirectly affect growing inequality, as observed through the lack of paid family leave (Ray et al., 2009) or work-sharing (Appelbaum, 2012), or the low rates of take-up of unemployment insurance (DeNavas-Walt and Proctor, 2014; Schaefer, 2010).

**Organizational and employment relationship changes**

Increasingly, scholars are beginning to turn their attention to the role of organizations and their employment relationships as explanatory factors driving specific dimensions of inequality. Increases in income inequality have been documented in organizations within and across industries (Groshen, 1991), between large and small firms (Davis and Haltiwanger, 1991), and among individuals within establishments (Barth et al., 2014). Next, we point to two factors that explain at least part of this organizational story: the changing environment and interests of firms as they relate to financialization, and organizations’ growing use of ‘fissured’ employment relationships.

**Financialization of corporate behavior**

A number of researchers have documented the rise of financialization, that is, the growing importance of maximizing shareholder value, in corporate behavior that began in the 1980s (Appelbaum and Batt, 2014; Jacoby, 2004; Kochan, 2016; Lazonick, 2009). The argument is that this shift has persisted since then as (1) new debt instruments (often referred to as junk bonds because they were offered at high-interest rates with little collateral) became available to support highly leveraged and sometimes hostile buyouts and takeovers of firms (Appelbaum and Batt, 2014; Lazonick, 2009), (2) new models for pricing stock options became available, leading firms to increase the portion of CEO pay tied to share price improvements (Black and Scholes, 1973; Merton, 1971), and (3) finance considerations dominated in corporate decision-making as the pressures from Wall Street agents increased and the countervailing power of unions declined (Jacoby, 2004; Useem, 1993). These developments in turn led to growing inequality as gains were diverted from the full labor force to shareholders and corporate officers. Although estimates vary, economists calculate that the current ratio of CEO to average hourly worker pay is now approximately 300:1, compared to only 20:1 in the 1960s (Mishel and Davis, 2015).

**Fissurization of employment relationships**

One result of financialization and increased focus on shareholder value can be observed through the restructuring of organizations from the vertically integrated, bureaucratic enterprises of the past to more networked, horizontally organized firms of today. Increasingly, these arrangements are reflected in the notion of ‘fissured’ work which includes not only contingent arrangements (e.g., temporary labor or contract workers), but also organizational structures resulting from subcontracting, outsourcing, and franchising (Weil, 2014).

The common thread throughout all these forms of fissured work is that they introduce external considerations into the firm–employee relationship, often placing the employment relationship outside its formal borders. When a Silicon Valley technology firm, for example, contracts out its janitorial positions, those jobs – and decisions regarding their wage levels – are no longer included in an enclosed system characterized by norms of internal equity among workers who labor for the same employer. Rather, the external, competitive market of janitorial contractors becomes a reference point through which wages are set as janitorial contractors vie for business.

The clearest illustration of how this contributes to inequality comes from a 2010 study of subcontracting of janitorial and building service workers in the US (Dube and Kaplan, 2010). Between 1983 and 2000, the occupational percentage of building security guards working for subcontractors increased from 40.1% to 49.7% and of janitors from 16.4% to 21.6%. This growth in contracting was accompanied by simultaneous wage loss: janitors experienced a US$1.33 wage penalty per hour (and earned 14% less than directly employed workers in the same occupation) and guards a penalty of US$2.34 per hour (earning 21% less). Similar trends in subcontracting have been reported in the petrochemical industry (Kochan et al., 1994), call centers (Batt et al., 2004), hotels (Hertz, 2010), and school cafeterias (McCain, 2009).

It is worth noting that the fissurization of work presents additional challenges to various other institutional factors we have identified as important to inequality. For instance, jobs in subcontracted arrangements are subject to greater risks of injuries and accidents (Kochan et al., 1994) as well as violations of labor law (Bernhardt et al., 2013), as the triangular employment relationship escapes regulatory checks on compliance through ambiguous legal standards defining workers’ employer of record (Zatz, 2008). Union organizing also becomes more difficult in settings where there is ambiguity over which employer is responsible for managing and controlling employees, and where there are workers misclassified as independent contractors (Kalleberg et al., 2000). Studies in other countries have likewise demonstrated that a range of human resource practices typically found in firms are either less likely to exist or to be constrained by the same uncertainty of which employer is responsible for managing the workforce in networked organizations (Marchington et al., 2011).

**Limited adoption and diffusion of high-road business models**

A large body of empirical research has documented the positive effects of sets of workplace practices labeled ‘high-performance work systems’ on productivity and other indicators of organizational performance (Appelbaum et al., 2011). These work systems in turn are supported by so-called high-road business strategies that compete on the basis of achieving high productivity and service quality rather than by minimizing and tightly controlling labor costs. The evidence on the relationship among these strategies and practices and wages is, however, somewhat mixed (Osterman, 1994): positive wage effects are more likely to be experienced in unionized than non-unionized firms (Bailey et al., 2001). Moreover, while there are case examples in almost all industries of high-road firms that pay above-average wages (e.g. Appelbaum et al., 2000; Cascio, 2006; Hoffer Gittell, 2003; Kochan et al., 2009; Ton, 2014), the reality is these strategies have not widely diffused across American industry. The mental model that labor is a cost to be minimized continues to dominate the behavior of many business decision-makers and analysts. If the hypothesis is correct that these high-road strategies and workplace practices are necessary conditions for achieving the high productivity needed to support high and increasing wages, the limited diffusion of these strategies and practices may serve as another cause of wage stagnation.

**Options for reversing trends in inequality**

While there is now widespread public recognition and concern about income inequality and persistent wage stagnation, action at the national policy level is slow in coming, largely because of deep political gridlock that blocks efforts to reform prevailing labor and employment policies (Kochan, 2016). There has, however, been increased activity at local levels, both by city and state-level governments and by private sector firms and unions. In this section, we review actions that have either been proposed or are underway that seek to address one or more of the aforementioned causes of inequality.

**Education and skills**

While SBTC has lost some of its power as the primary explanation for growing inequality, there is little doubt that one long-term effect of technological change is to increase demand for skills and education. Thus, education is a critical starting point – a necessary but far from sufficient solution for reversing these trends.

A highly educated, skilled, and innovative workforce is essential to generating the technological breakthroughs and improvements needed to drive productivity and to support a high-wage economy. Yet there is considerable evidence that the US educational system needs significant reforms to produce a workforce with both the technical (science, technological, engineering, and math or so-called STEM) and behavioral (communications, problem-solving, and coordination/negotiations) skills employers indicate they need both today and in the future. There is, however, considerable momentum in the US focused on addressing these challenges, starting with efforts to expand access to early childhood education. The Obama Administration’s and equivalent state-level pressures and incentives for reform and increased funding have generated a wave of innovation aimed at, among other things, promoting collaborative teacher–union–school district improvements (Bluestone and Kochan, 2011; Rubinstein and McCarthy, 2014), diffusion of a new common core of curriculum standards, and expansion of the school day or year.

There also is a growing recognition of the need to strengthen community colleges, vocational schools, and labor-management apprenticeships and other training programs that focus on building technical or so-called middle skills. The key actions needed are to better coordinate middle-skill educational and training programs with other labor market intermediaries, employers, and labor organizations that constitute what are now popularly described as the ‘eco-system’ for workforce development and training (Weaver and Osterman, 2014).

**Globalization and trade**

Globalization of economic activity will undoubtedly continue and generate benefits for the aggregate global economy, both for workers in developing economies and for those with the skills needed to compete in high productivity, innovation-based workplaces. This implies that efforts to promote high-productivity high-wage economies and business strategies must feature prominently in the approach taken to deal with globalization in the US and other advanced economies.

The major globalization-related policy issue currently under debate in many countries is the Trans Pacific Partnership trade agreement. It is highly controversial because some estimates of its likely impact on domestic employment and income suggest it will most likely favor corporations and those in the higher parts of the income distribution, while possibly reducing job opportunities of lower income workers (Rosnick, 2015). The Trans Pacific Partnership does, however, have stronger explicit provisions for minimum labor standards than those in prior multilateral trade agreements, including minimum wages, the right to form unions and collectively bargain, prohibition of forced labor, and limitations on use of export zones exempt from labor regulations.

Despite these standards, enforcement of labor protection provisions of trade agreements requires complementary strategies of national governments, multinational companies that monitor and work with their global suppliers, local and transnational non-governmental organizations and unions on the ground, and international labor organizations (Locke, 2013). Building these multi-stakeholder systems is critical: global trade will continue to create risks to both lower-wage and low-skilled workers in advanced economies. The Obama Administration has taken steps in this direction by creating and funding a set of advanced manufacturing institutes which support development of next generation technologies and products with investments in education, training, and promotion of high-road business strategies. Yet the need to promote high-road strategies goes beyond the next generation manufacturing firms, and there is no consensus strategy for doing so. Certainly, continued efforts to educate business leaders and investors about the strategic choices open to them and the consequences of their strategies for job and career quality need to continue.

**Employment and labor policy initiatives**

These educational and high-road strategies need to be complemented with government policies that bring up minimum labor standards to reduce the incentive to compete on the basis of minimizing labor costs and provide incentives to compete with high-productivity high-wage strategies. Here, we review examples of such initiatives and emphasize the role of local policy efforts in institution-building.

**Minimum and living wages**

Starting in the 1990s, advocates have relied on minimum and living wage campaigns to raise the wage floor in localities, cities, and states. By many measures, these have been effective both in raising wages for those paid at the minimum and those directly above them in the wage structure (Wicks-Lim, 2006). Twenty-nine states currently have minimum wage levels that are higher than the federal minimum; of these, 15 have indexed their minimum wages to inflation. A growing number of cities – such as San Francisco, CA and Seattle, WA – have followed suit, and have recently passed or are pursuing legislation to increase their local minimum wage to US$15 per hour over a number of years. Advocates also increasingly rely on living wage campaigns; currently, over 140 cities and counties have enacted such laws (Bernhardt and Osterman, 2016). Despite their spread, however, many of these policies cover a limited range of jobs – often work purchased or in other ways regulated by local governments or part of local economic development efforts – and thus have limited capacity to generate large-scale patterns of change.

Yet, in a hopeful sign, demands for change to the federal minimum wage are flourishing at the national level. In many respects, these demands have been led by workers and labor unions. The now-international ‘Fight for 15’ is one such example, rooted in early efforts among fast-food workers to increase wages and realize the right to organize in fissured work settings. Such efforts have effectively brought worker voice and demands addressing wage inequality front and center within the Obama Administration and among candidates of the upcoming 2016 US presidential election.

**Wage standards enforcement and administrative action**

Paired with campaigns to raise the wage floor are innovative approaches to enforcing wage regulations. For instance, advocates in San Francisco, CA successfully created a new city entity, the Office of Labor Standards Enforcement (OLSE), in 2001. The OLSE uses innovative cross-agency information-sharing and enforcement strategies to address wage violations and other labor standards infractions. To date, it has recovered over US$17m in back wages and collected over US$2m in employer penalties (Dietz et al., 2014). Notably, the OLSE also increases the effectiveness of enforcement activities by directly engaging with community-based and worker organizations, a best practice documented in the literature (Fine and Gordon, 2010).

At a national level, the Obama Administration has proposed increased coverage of salaried workers for overtime work, while also issuing a clarifying administrative letter detailing the criteria for worker classification as an employee or an independent contractor (which determines coverage under wage and overtime rules). The National Labor Relations Board has likewise issued a recent decision broadening the definition of ‘employer’ for the purpose of determining whether subcontracted work is covered under the nation’s labor relations statute, and similar cases concerning companies such as Federal Express and Uber are being considered in federal and state-level courts. Scholars are also increasingly documenting enforcement theories built on leveraging fissured, supply chain relationships among firms, often referred to as strategic enforcement (Weil, 2008; Wright and Brown, 2013).

**Government contracting rules**

One area of considerable discussion is whether the federal government can or should use its power as a purchaser of goods and services as a means of enforcing and improving employment standards. The model for doing so comes from the US experience in enforcing and promoting the 1964 Civil Rights Act, which prohibits discrimination in employment on the basis of race and sex, among other protected groups. A subsequent Executive Order required government contractors to demonstrate steps they take to achieve affirmative actions. Later research demonstrated the efficacy of these requirements in promoting non-discrimination and equal opportunities (Leonard, 1990). The question under debate in government and academic circles is whether this model could be applied to promote diffusion of high-productivity high-wage practices among government contractors. This remains to be seen. President Obama signed an executive order, effective in 2016, that requires contracting firms to disclose their records of compliance and violation of labor and employment law. Some suggest expanding this order by inserting high-productivity high-wage criteria in the specifications used to select competing bidders for government contracts – a strategy that may substitute for the role of pattern bargaining discussed earlier.

**Next generation unions and sources of power**

One of the biggest open questions facing both the US and to some extent other countries is what will fill the void left by union decline. While reproducing unions and collective bargaining in the mirror image of their past is neither likely nor viable, alternative means are needed to reinstate voice and bargaining at work. Indeed, unions are pursuing new strategies to this end, such as non-traditional organizing of freelancers and supporting organizing efforts targeting large employers in low-wage, union-scarce sectors, such as those in fast food as well as with the retailer Walmart (Bernhardt and Osterman, 2016).

The crisis in worker representation has also sparked considerable innovation in labor and community group coalitions, and among an expanding number of networks at local, national, and global levels. These range from religious-based groups (Bobo, 2009); to students mobilizing against sweatshop conditions; and to international coalitions of non-governmental organizations (NGOs), governments, international agencies, employers, and unions aimed at upgrading conditions in global supply chains (Locke, 2013). One of the most promising organizing strategies comes through worker centers, which are typically organized around specific, often low-wage industries such as restaurants or construction. By some estimates, there are currently 225 such organizations throughout the country, up from only five in 1992 (Fine, 2011). Perhaps most importantly, the federation of many local worker centers within fragmented industries – such as restaurants, domestic work, and taxi transportation – is establishing larger scale, more effective organizations (Fine, 2011).

**Alternative wage-setting criteria and norms**

As noted earlier, the tandem movement of productivity and real wages and compensation in the pre-1980s era was driven by, among other factors, union agreements that aligned productivity gains and cost of living clauses into collective bargaining contracts. New approaches to wage setting at the level of the enterprise will be needed to ensure that those who work together to generate productivity and profits have a fair chance of sharing in the gains produced. Profit sharing, productivity gains sharing, and broad-based employee stock ownership plans (Blasi et al., 2014) are alternative ways of embedding this principle in the wage-setting processes within specific enterprises.

New federal rules will soon require publication of salary ratios between CEOs and average workers in corporate reports. Whether this effort to increase transparency will be powerful enough to change corporate practices remains to be seen. Corporate boards may need stronger pressures to change the ways CEOs are paid (such as changes in marginal income tax rates; Piketty, 2014), given the embedded roles that compensation consultants play in spreading CEO compensation patterns across firms and industries.

**Labor policy**

While each of the options reviewed can contribute to stimulating wage growth and reducing inequality, sustained progress will require a fundamental change in national labor and employment policy. There are a number of dimensions to such change: updating minimum wage laws and clarifying the definition of the employer in fissured work settings, as described earlier, are two glaringly necessary changes. Expansion of safety net programs – such as the Earned Income Tax Credit, the Affordable Care Act, and paid family and medical leave – can provide low-income workers better access to employment opportunities while promoting overall economic growth (Lower-Basch, 2014). Additionally, updating current laws that govern collective bargaining is yet another step towards fundamental change, particularly since current law cannot provide union representation coverage to all workers who want it (Ferguson, 2008). It remains to be seen whether changing labor relations policy is possible, given that, both historically and recently, it has been the most difficult aspect of US employment policy to change (Kochan, 2016).

**Conclusion**

The widespread recognition and growing public debates over income inequality are producing a growing body of research on the causes of wage stagnation and options for addressing it within private and public realms. Until recently, most of the academic debate has focused on the relative importance of technology and globalization as underlying causal forces, and on education – and to a lesser extent, trade policies – as remedies. More recently, however, attention has turned to institutional factors including minimum wages, unions and their bargaining power, and employment policies and their enforcement. We extend this literature here to focus on some of the key changes in employment relationships and organizational practices that affect wages and related employment conditions at the enterprise level.

It is clear that these causal forces are closely interrelated and that no single change in policy or organizational practice will suffice to reverse long-term trends in wages. Investments in education are a necessary but far from sufficient component of a broader strategy. So too are more direct efforts to build next generation manufacturing industries in ways that support and sustain high-wage jobs. Equally important, however, are actions aimed at bringing up the floor of the wage structure through raises in minimum wages and better enforcement of employment standards, modernization of labor policies that allow workers to build new sources of bargaining power consistent with the modern economy, and organizational changes that challenge the financialization of corporations and encourage broader diffusion of firms that embrace high-road business strategies and workplace practices.

The historical trends in inequality, and particularly in productivity-wage growth patterns, suggest two final points. The current situation is the product of trends of over 30 years’ duration and therefore it will take a sustained period of wage growth to make up for lost ground. But the fact that turning points as clear as the ones that reversed the high level of inequality in the US observed just prior to the passage of the New Deal labor legislation in the 1930s and the beginning of the productivity-wage gap around 1980 suggest that a broad-based, systematic strategy that is well informed by research can change these long-run trends and put the economy on a different path. Doing so again is the defining challenge facing our field today.

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ICIS Chemical Business

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**Section:** WEEK IN BRIEF

**Length:** 2316 words

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**Body**

Briefing

Europe

Portugal’s Artlant PTA plant status unclear

It remains unclear whether Artlant PTA’s terephthalic acid (PTA) plant in Sines, Portugal, will be closed in May, as a company source refused to comment. There is some talk in the market that Artlant PTA may be looking to restart but there has been no confirmation of the group buying feedstock paraxylene (PX) yet either. In April, company sources confirmed the plant will remain shut.

UK growth slows to 0.4% in first quarter of 2016

The UK economy slowed in the first quarter of 2016 compared with the previous quarter, according to the Office for National ***Statistics***. Gross domestic product grew by 0.4% in the first three months of 2016, compared to 0.6% in previous quarter. The biggest growth was seen in the services sector while output from production, construction and ***agriculture*** fell. “The other three main industrial groupings within the economy decreased, with production falling by 0.4%, construction output by 0.9% and ***agriculture*** by 0.1%,” said the ONS.

Total Q1 refining, chems net operating income up

Total’s refining and chemicals segment posted a 3% year-on-year rise in its adjusted net operating income to $1.13bn in the first quarter of this year, boosted partly by high utilisation rates and favourable petrochemical margins, the French producer said. The company’s overall refinery output rose by 5% year on year to 2.11m bbl/day in the first quarter on the back of fewer shutdowns. “Petrochemical margins remained high due to strong demand for polymers and lower feedstock prices,” the company added.

Tanker with first US LNG arrives in Europe

The Creole Spirit tanker, delivering the first ever shipment of US liquefied natural gas (LNG) to Europe, docked on 27 April in the port of Sines, Portugal, according to the Portuguese buyer Galp Energia. Opinion is divided among analysts as to whether American LNG produced from shale gas could spark a price war with gas suppliers who make their deliveries to Europe via pipeline. Attention will particularly focus on the reaction of Russia’s Gazprom, which annually meets around one-third of Europe’s gas demand via pipelines routed through Belarus, Poland, Ukraine and other transit countries.

Moody’s places negative outlook SIBUR, PhosAgro

US credit rating agency Moody’s confirmed a negative outlook on the credit ratings of Russian petrochemicals major SIBUR and fertilizers group PhosAgro but held a stable its outlook for fertilizers producer Uralkali. Uralkali’s stable outlook was based on the company’s export potential and its low-cost position which allows high margins, boosted by the Russian rouble depreciation, although Moody’s warned that the group’s high corporate government risk was expected “to pressure the company’s ratings” in the next 12-18 months.

EFSA to review BPA’s impact on immune system

The European Food Safety Authority (EFSA) will review its position on the potential impact of bisphenol A (BPA) on the human immune system following the publication of a report by the Dutch national health institute. “The report recommends supporting research on alternatives to BPA and advising consumers to reduce their exposure to BPA from food and other sources,” said the EFSA. “EFSA’s expert Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF Panel) aims to issue a statement in the next few months,” it added.

BP’s Q1 petchems profit surges to $113m

BP’s petrochemicals business’ underlying replacement cost profit before interest and tax surged to $113m in the first quarter of this year from $17m in the same period of 2015 amid lower costs and better margins, it said. Petrochemicals production rose by 7.26% year on year to 3.8m tonnes in the first quarter of this year, the company said in a statement. “The result for the quarter reflects improved operations, lower costs and a slightly improved margin environment,” it added.

TTIP could cut costs and red tape – Cefic

Existing bureaucracy that stifles trade between EU and the US for the chemicals industry could be alleviated if the Transatlantic Trade and Investment Partnership (TTIP) agreement is signed, industry trade body Cefic said. “Due to a lack of alignment between the US and EU, if a chemical company based in Europe wants to ship their products to the US they have to individually repackage and relabel every single pack– this costs millions of euros,” said Rene van Sloten, executive director for industrial policy at Cefic.

NGLs imports won’t reverse Europe decline

Petrochemicals production in Europe will continue to be constrained by high energy and feedstocks costs once the crude oil price recovers and imports of natural gas liquids (NGLs) will have a limited impact until naphtha-based crackers are able to process ethane, the chief operating officer (COO) for chemicals at auditor KPMG said. Paul Harnick said the fall in the crude oil price during the last year has been only a temporary boost for petrochemicals in Europe.

americas

DuPont CEO expects Dow merger by Oct/Nov

The $130bn merger between US-based chemical majors Dow Chemical and DuPont will likely close by October, possibly November, DuPont CEO Ed Breen says. When announcing the deal last December, the companies had said they expected to close the transaction in the second half of 2016. After completion, DowDuPont will be split into an ***agricultural***, a materials sciences and a specialty products company. “We are looking at a shareholder vote at the end of the second quarter,” Breen told analysts during DuPont’s first-quarter results call.

Water shortage halts Venezuela resin plants

Venezuela’s high density polyethylene (HDPE) and linear low density (LLDPE) plants are shuttered because of water shortages. However, the nation’s low density (LDPE) plant is operating normally, sources said. Venezuela has faced problems with its power services for years, but the weather phenomenon El Niño has brought drought and restricted hydroelectric production. The government has moved to cut power consumption by 20%. Market sources say, however, that there is enough inventory in the nation to meet current domestic demand for PE.

DuPont raises full-year outlook as Q1 profits rise

DuPont has upgraded its earnings outlook for 2016 as first-quarter net income rose 19% year on year to $1.23bn, with the impact of currency headwinds and taxes likely to be lower than expected. “We made progress with our global cost savings and restructuring plan and are on track for savings of $730m in 2016, including significant improvements in our corporate cost performance,” said CEO Ed Breen. The company, which expects to merge with fellow US giant Dow Chemical, raised full-year earnings estimates by $0.10 per share to $3.05-3.20.

S&P lowers rating for US exxonmobil

Standard & Poor’s Ratings Services lowered its corporate credit and long-term debt ratings for oil and gas giant ExxonMobil, citing low commodity prices, high reinvestment requirements and large dividend payments. S&P lowered the rating to AA+ from AAA. Under S&P’s rating system, AA+ still has a “very strong capacity to meet its financial commitments”. S&P said the company’s debt level had more than doubled in recent years. The higher debt level also reflected dividends and share repurchases that substantially exceeded internally generated cash flow, S&P said.

Canada’s March propane stocks down almost 50%

Canadian March underground propane inventories fell both sequentially from February and year on year from March 2015. Propane storage was 525,900 cubic metres (cbm) – down 32,600cbm or 5.8% from February, and down 505,000cbm or nearly 50% from March 2015, the National Energy Board said. Propane is used as a feedstock in the petrochemical industry. Butane storage was 406,400cbm – up 33,100cbm or 8.8% from February, but down 156,200cbm or 27.8% from March 2015. Butanes are used in the production of refined products such as gasoline.

Brazil caustic soda demand declines

Caustic soda demand remains weak in Brazil, in line with the country’s troubled politics and economy. Brazil consumed 541,129 dry metric tonnes (dmt) of liquid caustic soda in the first three months of 2016, down by 12% from the 616,195 dmt consumed in the same period in 2015, according to ***data*** from Abiclor, the country’s association of chlor-alkali industries. Domestic production of liquid caustic soda through March was 333,913 dmt, 3.6% lower than in the same period in 2015. Caustic soda producers in Brazil are Braskem and Carbocloro.

March new-home sales fall 1.5% from Feb

March sales of new single-family houses slipped 1.5% from February, but the market performed better than the March 2015 estimate, the US ***Census*** Bureau says. March saw 511,000 new home sales, while February recorded 519,000. The median sales price was $288,000, and the average was $356,200. New single-family housing sales are one of several key economic indicators reported by the US ***Census*** Bureau each month. The housing market is a key downstream consumer sector for the chemicals industry, driving demand for a wide variety of resins and products.

Brazil GDP outlook continues to fall

Brazil’s central bank now says the economy will likely shrink by 3.88% this year. Each week, the bank ***surveys*** analysts about their forecasts for several economic indicators. Unlike the GDP, other ***statistics*** show some improvement. Inflation should run at 6.98%, down from 7.08% the previous week. The exchange rate should remain at a steady reais (R) 3.80. Aggravating the recession is a political crisis in which the president faces impeachment threats, making it difficult to adopt policies and reforms needed to reverse the downturn.

Japan’s Asahi Kasei opens US plastic unit

Japanese producer Asahi Kasei has officially opened its 30,000 tonne/year plastic compounds plant in Athens, Alabama. The US subsidiary, Asahi Kasei Plastics North America, also runs a 105,000 tonne/year performance plastic compounds in Fowlerville, Michigan. Company officials said the global expansion of compounding operations is a critical element in the strategic growth of its engineering plastics business.

WR Grace swings to Q1 loss on spin-off

US-based catalysts producer WR Grace swung to a net loss for Q1 as a result of costs from splitting two of its divisions off into a separate company. The company posted a $2.7m net loss for the quarter, compared with a $52.7m profit during the first three months of 2015, as a result of $40m in post-tax costs arising from the move to move its construction chemicals and Darex Packaging Technology subsidiaries into a separate listed business known as GCP Applied Technologies.

Goodyear Q1 volumes rise on Asia growth

US-based Goodyear’s first-quarter tyre unit volumes totaled 41.5m, up 2% year on year on growth in the Asia Pacific region, primarily in Japan and China. Replacement tyre shipments and original equipment unit volumes were each up 2%. Excluding the impact of the deconsolidation of Goodyear’s Venezuela subsidiary, unit volumes increased 3%. Q1 sales fell to $3.7bn, from $4.0bn in Q1 2015, largely due to unfavourable foreign currency translation and the deconsolidation in Venezuela. The company reported segment operating income of $419m, up from $388m in the year-earlier period.

asia

French Bostik opens new Philippines plant

Bostik, the specialty adhesives business of France-based chemicals firm Arkema, has expanded its cementitious powder production capacities with a new plant in the Philippines. The plant in Misamis Oriental will serve construction customers in the high-growth Mindanao and Visayas regions. Its products include tile adhesives, wall finishing products and other construction systems, Bostik said. Financial or capacity details were not disclosed. Bostik, which last year became part of Arkema, has been active in the Philippines since 2005.

PTT working on attaining on-spec phenol output

Thailand’s sole phenol/acetone producer PTT Phenol is working on attaining on-spec output at its new phenol/acetone plant, a company source said. The plant, located at Map Ta Phut in Rayong province, will have a capacity to manufacture 250,000 tonnes/year of phenol and 155,000 tonnes/year of acetone. The producer is still aiming to start commercial operations at the plant in May, the source said.

PCG shuts No 2 Labuan methanol unit

Malaysia’s PETRONAS Chemicals Group (PCG) has shut its No 2 methanol unit on 11 April due to technical issues, a company source said. “[The unplanned shutdown] will last for around seven days,” the source said. The No 2 methanol unit has a capacity of 1.7m tonnes/year. No disruptions in contract supply are expected during the shutdown period, the source added. PCG has two units at Labuan, with a combined nameplate capacity of 2.36m tonnes/year.

Taiwan’s TPCC scraps plan to raise phenol output

Taiwan Prosperity Chemical Corp (TPCC) has decided against raising its phenol/acetone output despite the recent improvement in market conditions, a company source said. TPCC’s plant, located at Linyuan in Kaohsiung county, has a capacity to produce 360,000 tonnes/year of phenol and 220,000 tonnes/year of acetone. TPCC has decided to continue running its phenol/acetone plant at around 50% capacity because of insufficient spot supply of raw material propylene and worries about the increase in its by-product acetone output.

MIDDLE EAST/AFRICA

SABIC Q1 net profit falls on lower product prices

SABIC’s first-quarter net profit fell by 13.2% year on year to Saudi riyal (SR) 3.41bn ($909m) because of lower product prices, the Saudi Arabia chemicals major said late on 25 April. The company’s gross profit fell by 10.9% year on year to SR8.39bn in the three months ending 31 March, with operational profit down by 18.3% at SR5.0bn. On a quarter-on-quarter basis, the company’s January-March net profit rose by 10.7%, with operational profit up by 14.7%.

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Trans-Atlantic deal discussed

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