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**Education:**

BA Philosophy, Politics & Economics, Balliol College, University of Oxford 2015

MSc Economics for Development (with Distinction), University of Oxford 2017

DPhil candidate in Economics, University of Oxford, 2017 to present

Thesis title: “*China, AI and Liberalization: Essays in Applied Microeconomics*”

Fields: International Trade, Development Economics

Expected completion date: Summer 2021

**References:**

Professor Chris Woodruff

Queen Elizabeth House, University of Oxford

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Professor Peter Neary

Economics Dept., University of Oxford

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Professor Ian Goldin

Oxford Martin School, University of Oxford

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**Teaching Experience:**

2020-21	International Trade – MSc Development Economics for Dr Jin Ho Kim
2019-21	Development Economics – Undergraduate Economics for Dr Sanjay Jain
2019-20	Econometrics – Ph.D. Continuing Education for Professor Jonathan Michie

**Research Experience:**

2/2021-present	Short Term Consultant, Development Research Group, World Bank
3-9/2020	Research Assistant, Professor Ian Goldin, University of Oxford
6-8/2019	Fund Internship Program, International Monetary Fund, Washington D.C.
8-9/2017	Research Assistant, Professor Christopher Woodruff, University of Oxford

**Honors, Scholarships, Awards:**

2020	CSAE Grant for purchase of data on Indian services firms
2019	CSAE Travel Grant for exploratory fieldwork in India
2019	Geoff Riddell Scholarship, Vincent’s Club, Oxford
2017	Kellogg Progress Scholarship, Clarendon Fund, Oxford
2016	Harvard Business School Credential of Readiness
2015	First in year, Development Economics Finals, Oxford
2015	Second in year, Economics of the Environment Finals, Oxford
2015	Westerman Pathfinders Scholarship, Balliol College, Oxford
2014	NT Huxley Exhibition, Balliol College, Oxford

### **Presentations:**

2021	Ruhr Graduate School in Economics, Oxford CSAE Conference, Royal Economics Society Symposium, University of Pretoria
2020	Oxford Trade Economics Workshop, Oxford Blavatnik School of Government, University of Warwick
2019	Queen Mary University of London, International Monetary Fund Fiscal Affairs Department

### **Research Papers in Progress:**

#### ***“Artificial intelligence, reshoring and services-led growth: Evidence from Indian job postings”*** (with Katherine Stapleton and Ashley Pople)

With manufacturing increasingly dominated by China and industrial robotics, services-led development models have become targets for future employment growth. Increased capabilities in artificial intelligence could undermine this by displacing labour (e.g. chat-bots replacing call centres), or could support employment by increasing worker productivity and creating new tasks or products. Greater AI capabilities in rich countries could drive task reshoring, or create new tasks to offshore (e.g. data tagging). We first use existing AI measures to investigate these forces in administrative data on the Indian services sector, and find evidence consistent with firm-level productivity effects and industry-level displacement effects. Current work in progress uses 32 million vacancy postings from India’s largest online jobs platform to extend the analysis.

#### ***“Robots and trade: Implications for developing countries”*** (with Erhan Artuc, Paulo Bastos and Bob Rijkers)

We examine the effects of robotization on developing countries, extending the Ricardian model of Artuc, Bastos and Rijkers (2018) and drawing on new firm-level robotization data from eleven developing countries. We present four main results. First, robot adoption in advanced economies can ultimately benefit workers in developing countries through lower prices and increased demand for intermediate inputs – though there may be adverse effects in the short run, particularly for the least mobile workers. Second, continued Chinese subsidization of robots is likely to reduce China’s trade with OECD countries, while increasing that with developing countries – as China’s profile of comparative advantage increasing aligns with the former. Third, larger and more globally-connected firms in developing countries are more likely to adopt robots, aligning with findings in developed countries, as they can afford the fixed costs of upgrading, and value the resulting precision more highly. Fourth, these firms expand post-adoption, increasing the competitive pressure on the smaller, less international firms in which those workers most vulnerable to replacement by robots are also more likely to work.

### **Research Papers:**

#### ***“Multi-product firms, networks and quality-upgrading: Evidence from China in India”***

This paper exploits China’s accession to the WTO to investigate the propagation of a supply shock across the Indian production network. Consistent with a model of multi-product manufacturers gaining access to higher-quality components, a fall in input tariffs raises revenue, quality and prices whilst lowering quality-adjusted prices and the probability of product exit. Upgrading persists for at least ten years; at the peak in 2010, products with a 10% higher pre-accession input tariff, and hence a larger post-accession fall in tariffs, have 5.3% higher quality. Broader input-output linkages then amplify this effect by up to 75%, with the first two links down the supply chain most significant. In contrast to existing literature focussed on negative demand effects of the ‘China shock’, these results highlight a potential beneficial impact in developing countries, namely supply-driven quality upgrading.

#### ***“The Role of Market Structure and Timing in Determining VAT Pass-Through”*** (IMF Working Paper, with Matthieu Bellon)

We examine the role of market characteristics and timing in explaining observed heterogeneity in VAT pass-through. We first extend existing theory to characterize the roles of imperfect competition and product differentiation, then investigate these relationships empirically using a panel of 14 Eurozone countries between 1999 and 2013. We find important roles for product market regulation and product quality, and little impact of advance announcement of reforms. Our findings have important implications for policy-makers considering VAT rate adjustments, by illuminating which of the consumers or the producers would experience the brunt of a reform across different settings.

***“How important is worker quality in total factor productivity dispersion? Evidence from manufacturing firms in Ghana” (MSc thesis, awarded Distinction)***

This paper considers the importance of human capital in determining the dispersion of total factor productivity in Ghanaian manufacturing firms. The real value of manufactured output in approximately 200 firms in a 12-year panel is regressed on two measures of human capital to derive a TFP residual, using the Levinsohn-Petrin method to control for unobservable productivity shocks which would otherwise bias the estimates. Education of production workers is found to explain less than 2% of TFP dispersion, measured as the ratio of the 90th to 10th percentiles of firm productivity. Even when including an imputed variable for the impact of unobserved human capital, such as intelligence and motivation, worker quality explains less than 15% of TFP dispersion. This suggests that it is predominantly differences in other factors which make some firms much less productive than others, contrasting with evidence from developed countries for a larger role for human capital. The importance of human capital as a determinant of TFP dispersion varies substantially across manufacturing industries. Several explanatory hypotheses are considered, and the results are found to be consistent with corresponding variation across industries in: i) the intrinsic productive value of human capital, ii) the degree to which the best managers are able to employ the best workers, and iii) the importance of some unmeasured physical capital with which human capital is complementary.

**Selected other activities:**

2019-Present	Junior Dean, St Benet’s Hall, University of Oxford
2019-20	President, Oxford University Blues Committee
2018-19	Captain, Oxford University Men’s Hockey Blues (First XI)
2018-19	President, Kellogg College Middle Common Room

**Personal Information:**

<i>Born:</i>	19 June 1993
<i>Citizenship:</i>	United Kingdom, Republic of Ireland
<i>Software:</i>	Stata, Mata, SQL, Gephi