

In-Progress Annotated Bibliography*

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References

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- [2] Daron Acemoglu and David Autor. Skills, Tasks and Technologies: Implications for Employment and Earnings. In David Card and Orley Ashenfelter, editors, *Handbook of labor economics, Volume 4, Part B*, volume Volume 4., chapter 12, pages 1043–1171. Elsevier, 2011.
- [3] Daron Acemoglu and Fabrizio Zilibotti. Productivity Differences. *National Bureau of Economic Research Working Paper Series*, No. 6879, 1999.
- [4] David Autor. The polarization of job opportunities in the US labor market: Implications for employment and earnings. Technical report, Center for American Progress and The Hamilton Project, 2010.

Data: MORG in CPS; March CPS, microdata. Income deflated by personal consumption deflator (PCE); microdata.

- [5] David H. Autor. The task approach to labor markets: an overview. *Journal for Labour Market Research*, pages 1–15, 2013.

The "task approach" (ALM) presents an alternative to the canonical production function approach to labour markets. It separates the tasks performed by labour and technology, allowing substitutions between factors.

Task: unit of work. Skill: worker's stock of capabilities.

The task-assignment model allocates high (H), medium (M) and low (L) skilled inputs on a unit interval. Computerisation, due to decr in cost of computing power, in routine tasks displaces the H/M and M/L boundary. Wage of M decreases, wage of H and L increase due to q-complementarity.

Major within-data limitations. Key: changing composition of tasks within jobs. Subject to continual optimisation. More recent literature considers actual tasks in jobs through surveys.

Also, endogenous task choice not considered by literature; should not assume assignment to skills are predetermined.

Further, orthogonal category: "offshorability."

Skills data available: <http://web.mit.edu/dautor/www>

- [6] David H Autor, Lawrence F Katz, and Melissa S Kearney. The Polarization of the U.S. Labor Market. *National Bureau of Economic Research Working Paper Series*, No. 11986, 2006.

Top part of wage distribution has grown steadily since 1980s. Bottom tail grew, but stagnated in the 1990s. Middle part of wage distribution fell in 1990s.

Propose model of computers substituting "routine" tasks. C-D production function with 3 types of labour: abstract, routine and manual; non-college educated labour performs the

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second two types. Computer capital, which gets cheaper, displaces workers in the routine labour category. Routine workers self-select out, into manual labour.

Data sources: 1. Hours-weighted wage data from US Current Population Survey (CPS) May samples 1973-78 2. Merged Outgoing Rotation Group (MORG) samples 1979-2004 3. 1980, 1990, 2000 Census Integrated Public Use Microsample (IPUMS) (i percentiles from employment data) 4. Occupation code mappings for 1980- i 1990- i 2000 (Meyer & Osborne 2005) 5. Proxied skills/quality with initial wages/educational levels 6. CPS data: 3-digit census occupations, employment growth by industry-gender-education

- [7] David H Autor, Lawrence F Katz, and Melissa S Kearney. Trends in US wage inequality: Revising the revisionists. *The Review of Economics and Statistics*, 90(2):300–323, 2008.

- [8] David H Autor, Frank Levy, and Richard J Murnane. The skill content of recent technological change: An empirical exploration. *The Quarterly Journal of Economics*, 118(4):1279–1333, 2003.

Seminal paper in "the task approach."

- [9] Paul Beaudry, David A Green, and Benjamin M Sand. The Great Reversal in the Demand for Skill and Cognitive Tasks. Working Paper 18901, National Bureau of Economic Research, March 2013.

- [10] Nick Bloom. Skill Biased Technical Change (SBTC), 2013.

USA wage inequality rising since 1960s, especially in the top half of the earnings distribution. But changing distribution of education doesn't explain rise in inequality. Robust to industry (shown with census data.) US, Canadian and British experience particularly pronounced. Europe experienced similar increase in inequality; borne out more in unemployment than wage (institutional explanation.)

The key explanation has been SBTC, which is increasingly rapid due to technical advances. Supply of skilled workers sped up in 1970s, slowed in 1980s; under this explanation excess of demand gives wage increase.

Causes of SBTC include (a) cheaper capital/computers, (b) institutional changes. Skills can be considered (a) complement physical+computer capital, or (b) particular skills needed for rapid change. Other explanations include international openness and trade, increasing competition for jobs at low end of spectrum. Further, labor institutions are changing, especially weaker unions.

Industry-level evidence: all industries increase in skill demand, skill premium. Change more rapid in industries with increasing computerization.

- [11] Jeff Borland, Joseph Hirschberg, and Jenny Lye. Computer knowledge and earnings: evidence for Australia. *Applied Economics*, 36(17):1979–1993, September 2004.

Introduction of computers has led to a change in skill demand. Paper attempts to estimate return to computer skill.

On this topic, three kinds of studies. (1) earnings vs industry tech usage; (2) relationship between tech change and demand for labour (skill composition of workforce); (3) workplace-level studies of technological change, workplace reorganization, demand for labour.

Data: 1993 ABS Training and Education Experience Survey. Microdata; includes subjective computer skills (basic/inter/adv).

A key problem is that computer knowledge is correlated with unobserved skills. Also, wage data is censored above, requiring a tobit-style regression. Find the premium is approx 18%, similar to GER, USA. Reduced to 10% when controls included. Level of skills important; usual practice of employing a single dummy may obscure results.

- [12] E Brynjolfsson and A McAfee. *Race against the machine: How the digital revolution is accelerating innovation, driving productivity, and irreversibly transforming employment and the economy*. 2011.

- [13] Mark Cully. More or less skilled workforce?: changes in the occupational composition of employment, 1993 to 1999. Technical report, National Institute of Labour Studies, Adelaide, South Australia, 1999.

Data: ASCO II, which includes tasks, and ABS cat. no. 6203.0.

ABS developed two-way mapping; 1996 census maps to both. Insufficient detail in census returns.

Finds, contrary to international evidence, that Australia does not experience skill bias. Posits growth in both areas.

- [14] Mark Cully. The Cleaner, the Waiter, the Computer Operator: Job Change, 1986-2001. *Australian Bulletin of Labour*, 28(3):141-162, 2002.
- [15] Peter Dawkins, Paul Gregg, and Rosanna Scutella. Employment Polarisation in Australia. *Economic Record*, 81(255):336-350, December 2005.
- [16] John E DiNardo and Jörn-Steffen Pischke. The returns to computer use revisited: Have pencils changed the wage structure too? *The Quarterly Journal of Economics*, 112(1):291-303, 1997.

Questions Kreuger's finding that computer use is associated with a wage premium. Finds similar results for Germany.

BUT, also finds a similar result for pencil use. The point is that the computer use literature is flawed, because computer use is correlated with so many other attributes. Contribution: first use of task-level data in literature.

- [17] Yvonne Dunlop and Peter Sheehan. Technology, skills and the changing nature of work. *Australian Bulletin of Labour*, 24(4):317-332, 1998.
- [18] Alexis Esposto. Skill: An elusive and ambiguous concept in labour market studies. *Australian Bulletin of Labour*, 34(1):100-124, 2008.
- [19] Alexis Esposto. Upskilling and polarisation in the Australian labour market: a simple analysis. *Australian Bulletin of Labour*, 37(2):191-216, 2012.

Follows Cully 1999's methodology. Basically decomposes labour demanded into categories given by the ASCO, and monitors trend. Simple, ordered skill categories devised.

Data: ASCO I & II; ABS survey of Employee Earnings, Benefits and Trade Union Membership (EEBTUM). Annual supplement to monthly LFS; since 1988. (Compatibility: 1989 data obtained at 4-digit level, re-coded for ASCO II.)

Increase in demand for managerial ASCO labour and "intermediate" category.

Found the labour force is upskilling, but this effect is different for part-time & full-time workers. Part-time males are de-skilling, on average, and female part-time upskilling somewhat. Secondly, the patterns for upskilling depend on sex and work type.

- [20] Alexis Esposto and Malcolm Abbott. A Look at the Long-term Accumulation of Human Capital and Knowledge Intensity of Work in Australia. *Economic Papers: A journal of applied economics and policy*, 30(3):414-430, September 2011.
- [21] Alexis Esposto and Andrea Garing. The Worker Activities of Australian Employees. *Economic Papers: A journal of applied economics and policy*, 31(3):346-358, September 2012.

Activity intensity in Aust jobs: full/part time, male/female, with respect to GWA ("generalised worker activities.") Mapping between O*NET and ASCO; determine job complexity. Calculated weighted GWA intensity index for 9 areas, from 42 O*NET descriptors ("WA").

Found that worker intensity (complexity) grew over last 35 years for full-timers, esp. women. Comparison of 9 areas for male/female and full/part time for 1971-2006. Full-timers do less physical work. Clear trend for full-time women moving into management; part-time men to manual labor. Data: Census, ASCO (I, II), O*NET

- [22] Alexis Esposto, Andrea Garing, Anne Langworthy, and Rebecca Feldmann. Skills Intensity: A Human Capital Approach to Understanding the Development of Regions. *International Review of Business Research Papers*, 8(4):80-93, 2012.

- [23] Alexis S Esposto. Dimensions of Earnings Inequality in Australia. 2005.
- [24] Sergio Firpo, Nicole Fortin, and Thomas Lemieux. Occupational tasks and changes in the wage structure. 2011.
- [25] Maarten Goos and Alan Manning. Lousy and Lovely Jobs: The Rising Polarization of Work in Britain. *Review of Economics and Statistics*, 89(1):118–133, February 2007.
- [26] Maarten Goos, Alan Manning, and Anna Salomons. Job Polarization in Europe. *American Economic Review*, 99(2):58–63, May 2009.
- [27] Maarten Goos, Alan Manning, and Anna Salomons. Explaining job polarization in Europe: the roles of technology, globalization and institutions. Technical report, 2010.
- [28] Dominique Goux and Eric Maurin. The Decline in Demand for Unskilled Labor: An Empirical Analysis Method and Its Application to France. *The Review of Economics and Statistics*, 82(4):596–607, November 2000.
- [29] Zvi Griliches. Capital-skill complementarity. *The review of Economics and Statistics*, 51(4):465–468, 1969.

Proposed capital skill-complementarity for 'skilled' rather than 'unskilled' labour.

- [30] Fatih Guvenen, Serdar Ozkan, and Jae Song. The Nature of Countercyclical Income Risk. Working Paper 18035, National Bureau of Economic Research, May 2012.

Income polarization seems to occur most strongly during expansions.

- [31] Richard G Harris and Peter E Robertson. The Dynamic Effects of the US Productivity Boom on Australia. *Economic Record*, 83:S35—S45, 2007.
- [32] Michael Keating. The Labour Market and Inequality. *Australian Economic Review*, 36(4):374–396, December 2003.
- [33] Per Krusell, Lee E Ohanian, José-Víctor Ríos-Rull, and Giovanni L Violante. Capital-skill Complementarity and Inequality: A Macroeconomic Analysis. *Econometrica*, 68(5):1029–1053, 2000.

Latent variable estimation of the skill premium for labour-capital complementarity. Much of variation explained by factor quantities. Modify Stokey 1996, based on Griliches 1969 (neoclassical aggregate P.F. with skill complementarity. Equipment, unskilled labor perfect substitutes; unit elasticity of substitution with skilled labor.) Use instead a four factor model; different elasticities of substitution among factors. Find that model explains most of variation in skill premium over 30 years. 4 factor model consistent with returns to income shares over time. Data: Our data consist of annual U.S. time series of capital and labor between 1963 and 1992. Capital stock from national income and product accounts; note critique of quality adjustment over time. Labor types based on education; college/non-college, from US CPS. Estimated using two-step SPML, 1963-1992. Subs elasticities b/w labour and equipment high for unskilled, low for skilled, which implies complementarity.

- [34] Frank Levy and Richard J Murnane. *The new division of labor: how computers change the way we work*. Princeton University Press, New York, 2004.
- [35] Kirkpatrick Sale. The Achievements of General Ludd: A Brief History of the Luddites. *The Ecologist*, 29(5):310–314, 1999.
- [36] Mark Wooden. The Changing Skill Composition of Labour Demand. *Australian Bulletin of Labour*, 26(3):191–198, 2000.