



EMPLOYMENT RESEARCH CENTRE

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## LOW SKILL MANUFACTURING WORK: FROM SKILL BIASED CHANGE TO TECHNOLOGICAL REGRESSION

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## **Introduction**

For most commentators and policy-makers it is probably self-evident that work is both becoming more skilled and more concentrated in the service sector. Such beliefs inform notions of the 'Knowledge Based Economy' (KBE) or 'Knowledge Based Society' (KBS). They can be found in official documents such as the Europe Union's Europe2020 programme (European Commission, 2010). Yet they often co-exist with a much more pessimistic prognosis: an increasingly polarised society characterised by growing numbers of low skilled service sector jobs. The optimistic and the pessimistic accounts are defined by different accounts of the development of skills, but they both agree that low skill employment in manufacturing industry will continue to decline. This paper explores three reasons why this prediction should be treated with caution.

The paper begins by outlining the intellectual basis for the conventional wisdom of the universal upgrading thesis and the image of the 'knowledge based society'. Recent sociological approaches to the question of skill consider how skills and occupations are socially constituted, but do not fundamentally undermine the upgrading thesis. The second part of the paper shows how alternative pessimistic thesis goes back to radical accounts of the 1970s, but is now articulated by the so-called 'routinisation' thesis within labour economics. This certainly explains how low skill work may develop within the service sector. Crucially it also suggests reasons for the continuation of low skill work within manufacturing: some jobs may be low skilled but not routine – they are difficult (or too expensive) to 'automate'. The third part of the paper moves away from technological determinism by considering the *employment strategy* of employers as they configure work to better utilise the different types of labour that is available. In particular, where workers can be deployed with few or no legal rights, employers may have little incentive for technological innovation. Indeed, both the history of slave labour and more contemporary accounts of illegal immigration show how technology can stagnate or even regress. Such contingencies are explored in the fourth part of the paper which uses arguments from political economy to explore the determinants of sectoral change. The decline of manufacturing industry turns out not to be a simple linear process, it is shaped by long-term socio-political choices and can even go into reverse.

### **Optimistic determinism: Skill biased technical change**

The belief that unskilled work in manufacturing industry is a residual form of employment is the logical corollary of two arguments first clearly linked in the seminal account of post-industrial society (Bell, 1973). Here technological change involves two shifts. Firstly, within each sector there is a process of upskilling: over time the proportion of unskilled and manual work within each sector falls, and that of professional and managerial rises (Chart 1 vertical arrow). For example, in manufacturing industry there are relatively fewer manual workers on the factory floor and more technicians and engineers. Secondly, over time there is a shift between economic sectors, so that employment in manufacturing falls while employment in the service sector rises (horizontal arrow). The two processes together produce a

movement from the bottom left hand corner of the chart to the upper right hand corner.

**Chart 1. Sectoral and occupational change**

	Primary (Agriculture)	Secondary (Manufacturing)	Tertiary (Services)	
Professional & managerial				↑
Routine white-collar				
Skilled and unskilled manual				

For Bell, both processes are the inevitable consequences of technological change. The belief that technical change makes jobs more skillful goes back at least to the classic text of American ‘industrial’ sociology, (Kerr et al, 1973). For Kerr, the demand of technology for ever greater skills fuels the ever greater demand for educated workers and enforces the shift from ascription to achievement as the basis for employment. For Bell it is not so much technology as scientific knowledge which is decisive. Indeed science, understood as *codified* knowledge, is the ‘axial principle of society’. Science is important because it is both the productive force on which economic progress depends, and a component of an increasing amount of jobs. However, Bell’s decisive contribution is the second strand of the argument, encapsulated in a chapter title in his book, ‘From Goods to Services: The Changing Shape of the Economy’. He stresses that in the post-industrial society employment growth is in the service sector, specifically in health, education and government. These sectors have more professional workers than does manufacturing, so ensuring that the *horizontal* shift between sectors is also an *upward* shift in skill composition (Chart 1).

Bell’s seminal account contains its own contradictions. The key role of scientific knowledge (hence the ‘KBS’ of today) sits uneasily with the expansion of the service sector understood as *social* services. Furthermore, while Bell sees these jobs as lacking any direct market rationale (hence they are usually outside the market in the state sector), today much subsequent service sector growth has been in business services and personal services. Of these, the latter in particular has a very different occupational structure, with large numbers of unskilled and low paid workers, and both areas are, despite Bell, very much driven by market forces.

In the decades after Bell, influential accounts of contemporary stratification have continued to link social power to knowledge. For Reich (1993) the dominant group of contemporary society are ‘symbolic analysts’, those who manipulate information and

symbols; for Florida (2004) the key group are the ‘creative class’. Interestingly these writings involve a move away from the straightforward equation of skill with scientific knowledge that we find in Bell. For Reich symbolic analysts seem to be characterised by the *social* or at least *organisational* skills of networking, while for Florida what matters is precisely ‘creativity’. At the same time however, those who possess these attributes are assumed to inhabit occupational categories, essentially those in professional and managerial jobs. Conversely, these authors assume an increasing irrelevance of unskilled work in manufacturing industry. For Reich ‘routine production workers’ such as data entry or – more relevant for us – assembly line workers are doing tasks which can either be automated or outsourced. From this perspective, routine work in manufacturing industry can be expected to disappear. Equally for Florida writing a decade later, the ‘working class’ comprises ‘people in production operations, transportations and materials moving, and repair and maintenance work’ (74); he reports that such occupations have declined substantially since 1950 and now comprise about 25% of all American employees.

Within labour economics the hypothesis that skill demands are rising has been formulated as the Skill-Biased Technical Change (SBTC) thesis (see Katz and Autor, 1999 for summary): technical change produces rising skill demands within occupations and in particular a rise in the absolute and relative number of skilled occupations. This explains how an expansion of education can go together with rising returns to education and hence rising wage inequality (e.g. Acemoglu 2002; Natichhioni et al, 2008). Like Kerr, SBTC advocates seem to simply assume that an increasing technical content of work inherently produces rising skill demands throughout the organisation. Thus at the top end of the occupational hierarchy, they assume an equation of ‘skill’ with technical content, harping back to Bell’s assumptions. By contrast, the understanding of skill in the later writers Reich and Florida includes social skills and soft skills. Nonetheless, at the bottom of the occupational hierarchy, unskilled work remains simply an unexplored residual category, as it was for Bell.

The SBTC thesis focuses on *occupations* and takes their skill content as fixed during the period in which change is examined. Since it assumes the skill content (or at least ‘level’) is constant, it studies change in terms of the shifting relative size of occupations. Thus evidence for the SBTC thesis is adduced from the growing number in managerial occupations. Perhaps more so than economists, sociologists however have concentrated on the skill content of occupations. In relation to the upper end of the occupational hierarchy, there is a lively debate over the skill content of ‘managerial’ jobs. This involves ‘graduateness’ and the extent to which the growing number of graduates produced by the expansion of third level education do in fact carry out jobs, that whatever their formal title, do in practice demand a graduate education (Brown and Hesketh, 2004).

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<sup>1</sup> Florida’s figures are from US Bureau of Labor Statistics, Occupational Employment Survey 1999; they count all those *employees at work* in specific *occupations* (330). Florida’s text does not comment on the apparent stabilisation in the working class share of employment between 1991 and 1999 after a rapid fall from a peak of 41.1% in 1950 (Appendix A Table 2, p. 332).

Once it is accepted that the content of an occupation can change over time, or more fundamentally perhaps, that occupations are *socially constructed* bundles of jobs and tasks, then it follows that skill cannot be studied only in terms of educational qualifications that are attached to occupations (Green, Felstead and Gallie, 2003). Changes in skill can only be studied by examining what people actually do at work. Work involves both task complexity and discretion, and the two cannot be assumed to vary together. Skill itself is not simply a function of either or both these dimensions, but is defined in terms of (a) formal educational qualification; (b) the extent of training (after completion of full-time education); (c) length of on-the-job training. While they accept the relevance of detailed workplace ethnographies, Gallie et al (2003) argue that only large scale social surveys with some form of time dimension can assess movements in skill. In practice this means relying on cross-sectional studies which ask respondents to assess changes in their job. Thus using three such data sets spanning 1986 to 2003 in the UK Gallie and his co-workers claim to be able to identify a general and significant rise in skills in all occupations, even though this is also accompanied – especially in professional jobs – by closer supervision and less task discretion.

Investigating the continuation of low-skill work in manufacturing industry therefore turns out to involve more than simply counting low-skilled occupations. At least according to Gallie's research, the level of formal qualifications required for these jobs has risen somewhat, and by itself this certainly could indicate credentialism (a change in the entry condition, rather than a change in the job itself). Nonetheless, the reported rise in perceived training needs suggests that the least skilled jobs in industry are becoming more 'skilled'. To this extent, such comparative cross-sectional survey research does confirm the grandiose claims of the optimistic technological determinist thesis.

### **Pessimistic determinism: the routinisation thesis**

The SBTC thesis works with a general concept of technical change. By contrast, its recent reformulation as the routinisation thesis (Autor et al 2003; Goos and Manning 2007) considers technical change purely in terms of Information and Communication Technology (ICT). In order to gauge the impact of ICT, Autor et al differentiate jobs on two dimensions, as cognitive/interactive or manual, and *also* as either routine or non-routine. This is shown in Chart 2 which however (unlike Autor et al) separates cognitive work and interactive work. Computerisation replaces routine work (whether cognitive/interactive or manual), but not non-routine work. It is the division between routine and non-routine, and not between manual and non-manual work, which determines the impact of computerisation.

**Chart 2 Occupational classifications**

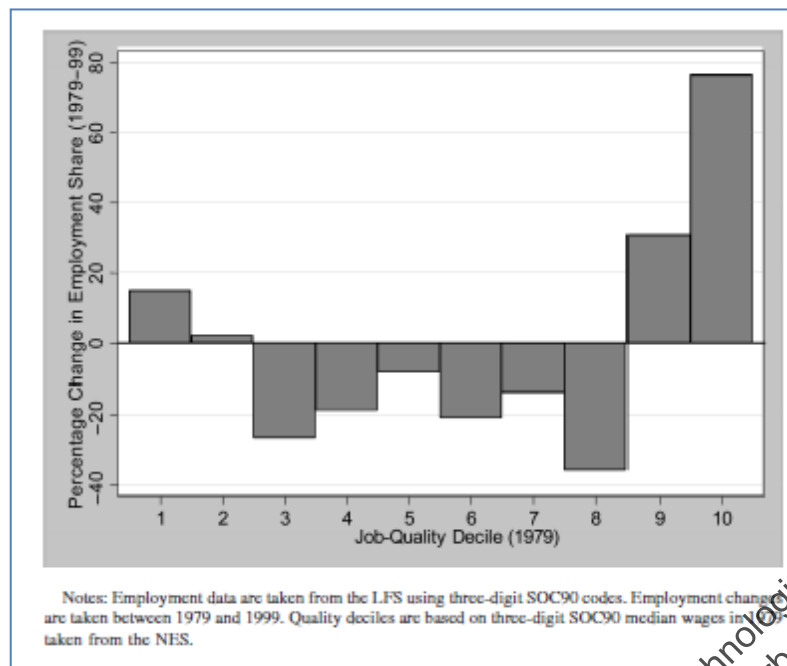
	<b>Non-routine</b>	<b>Routine</b>
<b>Cognitive</b>	<b>Managerial and professional</b>	<b>Clerical and administrative</b>
<b>Interactive</b>	<b>Sales</b>	<b>[Scripted interaction (call centres, McDonalds...)]</b>
<b>Manual</b>	<b>Drivers</b>	<b>Operatives</b>

On this basis Goos and Manning (2007) suggest that technical change currently increases the number of both good and bad jobs ('lovely' jobs and 'lousy' jobs), while reducing the number of intermediate jobs. Using UK Labour Force Survey data for 1979 to 1999, they first rank occupations by the median wage in the initial period; they then show that the occupations which have grown by the end of the period are those at the top and (to a lesser extent) at the bottom of this hierarchy (Chart 3). Growing occupations include software engineers and management consultants, but also care assistants and check-out operators. By contrast, jobs have been lost amongst intermediate occupations, nearly all of which are skilled or semi-skilled occupations in extractive or manufacturing industry (coal mine labourers, grinding machine setters, etc.). Goos et al (2009) find broadly similar results for 16 (West) European countries: almost everywhere there is a growth at either end of the occupational structure.

The routinisation thesis fits well with the frequently observed growth in low paid service sector jobs. Reviewing occupational change in the USA over the 20<sup>th</sup> century, Wyatt and Hecker (2006) document the rise in managerial and professional occupations, the rise in service workers especially in food service, and the decline in craft and operative workers in industry. However, the routinisation thesis also has implications for employment in manufacturing industry. The conventional wisdom suggests that employment in manufacturing industry will decline, and that this decline will be greatest amongst unskilled jobs. By contrast, the routinisation thesis suggests that even within technologically advanced manufacturing as in Germany or even now Ireland, some unskilled but non-routine jobs are likely to continue to exist.

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**Chart 3 Percentage Change in Employment Share by Job Quality Decile: UK 1979-1999**



Source: Goos and Manning (2007).

According to the routinisation thesis therefore, technical change does not remove *manual* work or *unskilled* work, but routine work. However, the definition of 'routine' is itself problematic. It appears that the authors consider interactive work as inherently non-routine. This ignores the vast management effort in recent decades to precisely routinise interactive work through processes of 'McDonaldisation' (Ritzer, 1995). Such routinisation can lead to the replacement of the human worker, usually through self-service where the consumer interacts directly with the computer. However, the extensive literature on call centres also shows that the routinisation of interaction (scripts, automated call distribution systems etc) along with a greater importance for aspects of emotional and/or aesthetic labour (Wickham and Collins, 2004).

The example of the call centre shows the major problem with the routinisation thesis: the understanding of computerisation. Computerisation is understood as the replacement / automation of existing tasks. This ignores the systemic aspect of information technology. ICTs are a generic technology which is found in all areas of the economy and in this sense their role is similar to the historic role of steam or electric power. However, ICTs are also systemic technologies which become part of the 'fibre' of organisations (Castells, 1996) and thus can involve far more than merely the automation of existing processes. Using UK 2004 WIRS data, Dolton and Pelkonen (2009) show that while 75% of all workers have some computer use at work, most users have multiple usages. They identify three types of usage: 'manual', 'office' and 'creative'. 'Computerisation' thus not only creates new jobs, some of these may themselves be relatively unskilled jobs, and this is just as likely to be the case in manufacturing as in service sector employment.

Technological change is normally assumed to lead to more skilled work. The routinisation thesis challenges this because it uncouples low skill and routine: some low skill tasks *cannot* be 'automated'. The earlier deskilling thesis of Braverman linked technological change to deskilling but this involved the assumption that the deskilled tasks would be simple and easy to supervise. For Braverman a Taylorist production process such as an assembly line human labour can be both integrated into a complex machine system ('high technology') and itself low skilled, yet these new tasks can in turn be 'automated'. The contribution of the routinisation thesis is the awareness that not all low skill jobs are of this nature so that technological and organisational change may well create new unskilled jobs, including in manufacturing industry. Furthermore, to the extent that these jobs are new jobs, the argument is not necessarily contradicted by the findings of Gallie et al discussed above, since these focused on reported change within existing jobs.

### **Employers' strategies, labour supply and technological regression**

Since one (and only one) driver of technological change is the need to reduce labour costs within the production process, it follows that cheaper labour can be a substitute for expensive capital. Rather than simply assuming that technological change in the production process follows a unilinear direction, technological change has to be linked to the employment strategy (Wickham, 1997) of the enterprise: the particular mix of different forms of labour (and hence the particular wage structure) that the enterprise deploys. One aspect of labour involves the different skills within the labour force, and this is not just a question of technical skills and qualifications, but also of soft skills and attitudes to work. Another aspect is the employment conditions under which workers can be deployed, ranging from hours of work, health and safety precautions to the crucial question of the employment contract. The more docile, or the more constrained, is the labour force, the more one incentive for technological progress in the production process itself is removed. If labour is cheap and obedient, there is less incentive to replace it. Consequently, it is logically possible for technological change to regress and for the production process to return to simpler and less skilled methods.

The most likely situation for this to happen is under extreme forms of labour discipline involving forced labour and even slave labour. The definition of slave labour is itself a matter of dispute. The ante-bellum American South is usually taken as the paradigmatic case of a slave labour system. However, it was actually unusual: after the ending of the Atlantic slave trade it depended on slaves who were born as slaves, whereas most slave systems rely on the continual enslaving of new slaves (Buggeln, 2008). In such conditions the product tends to be simple and the labour unskilled. The Russian gulags could indeed produce sophisticated products such as missiles, but most were construction, mining and logging camps. Work was usually general manual work: 'unskilled, physically demanding hard labour', sometimes with hand-made tools (Applebaum, 2003: 209). Mao's Great Leap Forward attempted to produce industrial goods and especially steel with very simple production processes (Dikötter, 2010: 58). Here too the human cost was horrendous, with the direct and indirect death toll running into millions. In both these cases the labour supply appeared almost indefinite and totally controlled, and in both these cases there was



technological regression in terms of both the product and the labour process. Production was of simpler products with simpler technologies.

Slave labour in Nazi Germany appears a more complex case (Spoerer and Fleischhacker, 2002). Although nearly all labour was treated as completely expendable, in a few cases the products were often technologically sophisticated. Approximately 20,000 labourers died in the Mittelwerk complex near Nordhausen that produced the V1 and V2 rockets – more than the total number of British civilians killed by the rockets which they produced. However, most of these deaths were of construction workers (Bauhäftlinge); deaths amongst the actual production workers (Produktionshäftlinge) were considerably lower (Wagner, 1998). In the camps as a whole death rates amongst the (very few) highly skilled slave workers were lower still (Froebe, 1998). These extreme cases suggest that terroristic labour discipline is not completely incompatible with skilled work but that in general the more extreme the labour discipline, the more likely the work is unskilled. Indeed, it is possible that the difference between Russian and American nuclear missiles during the Cold War (MacKenzie, 1991) was in part the result of the difference between free and unfree labour.

Today however slavery is ‘re-privatised’ (Buggeln, 2008). It occurs not because, as in the American South in the 19<sup>th</sup> century, labour is in short supply but for the opposite reason: there is simply so much available. This global re-emergence of private slavery is linked to the new immigrant labour forces in the ‘developed world’. Although actual slavery is rare within Western Europe, the conditions under which some immigrants work come quite close. In general immigrants are recruited because they are cheap, prepared to tolerate strict discipline and to carry out physical manual labour with minimal health and safety regulations.<sup>2</sup> Immigrants tolerate these conditions because they expect them to be temporary: immigrants expect to return home or to move on to a better job. Immigrants operate with a dual frame of reference, comparing wages and conditions not with other jobs in the host country but with those in their country of origin (Waldinger and Lichter, 2003). The question of forced labour arises when the immigrant has few or no chances of actually changing jobs. At the most benign this occurs when the immigrant’s right to residence is linked to a specific job, as in many work permit systems. In some cases illegal immigrants are tied to their job by the threat that dismissal will result in deportation, although in Western Europe this is actually rather rare. Far more significant are cases where illegal labour is directly imported and controlled by the employers: a practice which began in the sex industry (Glenny, 2007) but as we shall see, has now spread to areas of low cost manufacturing within Europe.

The relationship between technological change and new labour supply was different in the period of fordist mass immigration than it is today. Certainly there were cases, such as the textile industry in the North of England, where immigrants provided a new supply of cheap docile labour which kept existing industries and technologies economically viable for a few more years (Goodhart, 2011). The driving force however was the expansion of semi-skilled work in large organisations, above

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<sup>2</sup> This is hardly restricted to Western Europe. Afghan immigrants are now preferred to native Iranians on Iranian construction sites (Wickramasekara et al, 2006: 76)

all of course the new mass production industries with new production technologies. By contrast contemporary studies suggest that the use of newly arrived immigrant labour in sectors of UK manufacturing merely continues the long established 'low road' strategy of British industry, with firms in mature sectors competing on cost rather than on quality and innovation and operating within a 'low skill equilibrium' (Finegold and Soskice, 1988). Thus, rather than producing more complex products and moving away from their low skill strategy, firms have proactively accessed new sources of 'good workers' especially from Eastern Europe. For example, one case study describes a bottle recycling factory in North East with a workforce of nearly 300 workers, 90% of whom are now migrants. When indigenous workers were no longer prepared to tolerate the wages and conditions, management began to recruit local women, then young workers, then migrants, first refugees from the Balkans, then from Eastern Europe. The expansion of the EU in 2004 allowed the firm to recruit workers from Poland and Latvia, this time without infringing any immigration laws (MacKenzie and Forde, 2009; Forde and Mackenzie, 2009).

Other UK research shows how the food processing industry has become increasingly dependent on migrant labour. Out in the fields, the farm workforce is largely an immigrant workforce, especially in seasonal work where only 16% of the peak seasonal workforce is British. At the same time, food processing has become a more important part of the value of increasingly sophisticated products. Especially important here is the expansion of pre-packed products and complete meals. In food processing and food packing about 40% of the workforce is now foreign, with over 90% of employers citing such workers' "work ethic" as their main attraction (Ruhs and Anderson, 2010: 204). The supermarket chains that now dominate British food retailing exert continuous price pressure on their suppliers, and this in turn puts pressure on wage costs. This is a relatively labour intensive industry, and the few ethnographic studies we have (e.g. Wilezek et al, 2009) do report relatively simple levels of mechanisation and little capital investment. It is therefore plausible that the availability of migrant labour has contributed to firms' continuation of the low technology option. Rather than changing their production technology, firms innovate in their recruitment strategy to ensure a ready supply of what they consider to be the appropriate workers (Ruhs and Anderson, 2010).

Similar developments appear to be taking place in the USA. Crucial sectors of US agriculture have become dependent on low wage immigrant labour; the low wages in turn are in part because the labour is illegal. Californian fruit and vegetable production in particular now involve 'a vicious circle between farm employment, immigration and poverty' (Martin, 2009: 49). The availability of a new cheap and easily controlled labour force has led to parallel developments in sections of the food processing industry. Meatpacking used to be heavily unionised with a wage premium because of the dangers involved. Now firms have moved to rural areas and some of the largest firms in the industry employ large numbers of illegal immigrants (Martin, 2009: 94), although it is unclear whether this has involved any changes in the production technology and skill requirements. Employers – sometimes joined by immigration advocates – argue that American food production can only occur if there is (cheap) immigrant labour. An alternative employment strategy would end the reliance on continual inflows of illegal immigrants by investment in mechanisation.

As the leading researcher comments with reference to American 19<sup>th</sup> century debates: 'History is littered with predictions that there are no alternatives to slaves or guest workers to produce food and fiber' (Martin, 2009: 139).

The UK case suggests a growing path dependency of sections of manufacturing industry along a low skill trajectory. Nonetheless, there are clear limits to this process. Although UK labour legislation is less restrictive than that of many other EU countries, basic health and safety legislation does remain in place. The fact that the new source of labour is the Accession States of the EU is also ambiguous. On the one hand such workers are clearly prepared to take more arduous work at lower levels of pay than are 'native' workers (including members of established ethnic minorities), but on the other hand as EU citizens they have been granted full access to the labour market. This means that they cannot be tied to individual employers in the way that is normal for holders of work permits, let alone for illegal immigrants. Union organisation is difficult but not impossible and minimum wage legislation is operative (Fitzgerald and Hardy, 2010). This regulatory framework not only puts limits on levels of exploitation, but also probably limits the extent to which the low skill strategy becomes one of technological regression. While the 'gangmaster' system allowed a new class of tied labour to develop (Cohen, 2008), it too has been restricted by recent legislation (Gangmasters Licensing Authority, 2011).

Elsewhere in Europe there are however workplaces emerging which appear to be outside these minimal restraints and thus closer to actual slavery. Many small firms in the industrial districts of the 'Third Italy' have responded to price competition by outsourcing, moving routine work processes to cheap labour countries ranging from former Yugoslavia to North Africa (Rabellotti et al., 2009). Others have responded by recruiting cheaper labour at home and now rely on immigrant labour, especially from sub-Saharan Africa. Here many workers start off as illegal but can gain residency status, especially through Italy's frequent immigration amnesties. However, these amnesties often only regularise immigrants' in their current employment, they do not necessarily result in the unrestricted right to permanent residence. Many immigrants move from irregular to regular status – and then back again (Reyneri, 2004). Firms in areas such as the Veneto have for over ten years now been recruiting such immigrants who arrive in the area looking for work (there are no reports of employers actively seeking workers abroad as has occurred in the UK). In the classic industrial district the production process tended to involve high but informal skills rooted in a workplace community in which employer and employee were often related. The firms value the immigrants' 'work ethic' (and this is often contrasted favourably with that of native Italians). However, the new social and legal division within the workforce undermines the workplace community which has been the basis of the region's success. Even if they are legal, 'extracomunitari' are considered foreign and not part of the national community. It is plausible that this means that the informal knowledge generation and transmission of the district is undermined (Andall, 2007). At least some Italian industrial districts therefore appear to be moving *away* from skilled towards unskilled work. Within manufacturing industry technological change can sometimes mean technological regression.

### **Sectoral change, institutional systems and insourcing**

Unlike occupational polarisation, the sectoral shift from manufacturing to services is uncontroversial within social science. However, whereas theories of the Knowledge Based Society simply take this shift as the automatic result of autonomous technological progress, its extent and form is arguably shaped by political decisions and institutional systems. For example, employment growth in the service sector depends massively on the political decisions that shape health and education (see especially Doogan, 2009). Not surprisingly, the advanced welfare states of Scandinavia generate extensive service sector employment especially in childcare and elderly care (Bosch and Wagner, 2004; Bosch et al, 2009). More recently, government environmental policy is leading to growth in some manufacturing industry. This may involve new products with a high skill content as in engineering, but it is also stimulating the small recycling industry where many jobs appear to be unskilled and low paid.

One well established debate concerns the importance of manufacturing in national economies. Within Europe the UK and Germany are often cited as exemplars of two different 'varieties of capitalism', a Liberal Market Economy and a Coordinated Market Economy respectively. In the former the institutional systems favour the development of services, whereas in the latter they favour high quality manufacturing. While the City of London is Europe's only global financial centre, Germany is its manufacturing export powerhouse (Hall and Soskice (2001) for original formulation; for update and implications for employment see especially Bosch, Rubery and Lehndorff (2009)). In some accounts political decisions play a very direct role. The notorious failure of British industry to modernise in the third quarter of the last century, coupled with the country's conflictual industrial relations, led to the Thatcher government's decision to demolish the heartlands of British trade unionism not only in the publicly owned coal industry but also in broad swathes of privately owned manufacturing. The flip side was essentially a national wager on global financial services starting with the 'Big Bang' of financial deregulation in 1986. Despite conventional assumptions of the role of technical and scientific knowledge in economic growth, there was an actual decline in the number of engineers and scientists in the UK in the 1990s<sup>3</sup> (Nolan and Slater, 2010).

In the British case, the decline of manufacturing employment in the last quarter of the 20<sup>th</sup> century was therefore in part a political process. However, in certain circumstances new forms of low skill manufacturing can develop within advanced economies. Discussing the emergence of London and New York as new 'global cities', Sassen (1996) claimed that occupational polarisation was generating new forms of low income service sector employment. As an account of occupational (as opposed to income) polarisation of London in the 1980s and 1990s, Sassen can be justifiably accused of conflating 'European' London and 'American' New York

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<sup>3</sup> According to Nolan and Slater, the number of engineers in Britain grew rapidly in the 1950s and 1960s. One untold aspect of British economic history is that the collapse of manufacturing in the 1970s was not some simple Victorian hubris. High technology manufacturing actually grew from the 1930s through the 1950s with the emergence of sectors such as aerospace and nuclear power.

(Hamnett, 1996); in terms of occupation the major social structural change was not polarisation but the growth of both elite occupations and the ‘middle middle mass’ (Butler et al, 2008). However, this criticism ignores Sassen’s prescient point that low skill immigration into cities such as London has allowed the (re)development of forms of *manufacturing* utilising cheaper and more docile labour than that of the indigenous working class.

The clearest case is the expansion of ethnic industry in Europe. Traditionally ethnic entrepreneurship in Europe has meant either servicing the ethnic community or providing ethnic services (e.g. restaurants) to the wider market. However in Italy Chinese entrepreneurs have entered the clothing and textile industry. Here labour conditions can come close to actual slavery, not least because so much of high fashion production is now partially controlled by Chinese and Italian criminal gangs (Saviano, 2008). This is a world of micro-firms who often utilise the labour of family members: leisure and family life are sacrificed to extraordinarily long working hours (Ceccagno, 2007). Illegal immigration is central to the system, since it ensures that workers are usually bound to their employer. The result is a workforce which is very cheap, even though there have been incidences of trade union organisation and hence of intra-ethnic conflict. In some industrial districts, of which the most famous is Prato, Chinese firms have essentially supplanted indigenous firms in the district’s core activity and are now also taking over the role of managing the entire production chain of *pronto moda* (ready to wear fashion) (Ceccagno, 2003; Mallet and Dinmore, 2011).

Similar developments are taking place in the 11<sup>th</sup> arrondissement of Paris. Here an entire district has become filled with Chinese-owned workshops finishing clothes for the Parisian prêt à porter trade. Skills are the conventional skills of the tailoring trade; machinery is nothing more complicated than a sewing machine. Here too low cost low skill manufacturing is actually expanding with the importation of a new labour force – a labour force that is very close to a slave labour force. Instead of European firms outsourcing production to China, the importation of labour and entrepreneurs has allowed production to be ‘in-sourced’ and a new low skill manufacturing sector to grow.

## **Conclusion**

Conventional accounts of structural change in economics and sociology see changes in employment as the result of technological change, itself understood as a unilinear and predetermined process. Normally this results in the optimistic belief that low skill manufacturing work is a remnant of the past. This conclusion summarises the three rather different reasons why low skill work may continue within manufacturing industry and suggests possible links to the quality of employment.

Remaining firmly within the technological determinist paradigm, the routinisation thesis comes to rather different conclusions from the conventional wisdom. Here technological change is still understood as a unilinear process in which technology replaces human labour, but the argument claims that it is only *routine* labour that is replaced. Since labour can be both non-routine and unskilled, it follows that unskilled work will continue to exist. The main thrust of the routinisation thesis is to explain the continuation of ‘lousy jobs’ within the service sector, but it is clearly also relevant to manufacturing industry. In particular the routinisation thesis suggests that

unskilled work will continue to exist even in 'high tech' manufacturing industry with both high technology and high technology production processes. While there is very little research that identifies such jobs, it is arguable that these could be 'good bad jobs'. While they are low skilled, they do not *necessarily* depend on low pay and harsh labour discipline.

The nature of work is not only shaped by available technology, for firms themselves choose technology and decide to hire particular types of employees. Where cheap and preferably docile labour is available, then enterprises' employment strategy, so ran the second argument, may reduce the pressure for technological innovation. Cheap labour may allow production technologies to stagnate. Indeed, in the most extreme cases, production technology can even move backwards. Technological progress is replaced by technological regression, low skill work in manufacturing industry continues or even grows. In this case, the jobs only occur because they are bad jobs.

Finally, sectoral change (as opposed to occupational change within sectors) is also not completely pre-determined. While the socio-political processes that shape the service sector have been discussed, similar issues in relation to the manufacturing sector are usually ignored. Especially if low paid and willing labour becomes available, new areas of low skill manufacturing can develop within advanced economies. Manufacturing tasks can be outsourced to low wage economies and this has been much analysed. However, the converse is also possible: low wage labour can be moved to advanced societies and the tasks actually insourced. Here even more than in the other cases, these new jobs only exist because they are bad jobs. Not only are the jobs themselves 'dull and dirty', but they are held by workers with almost none of the rights which citizens of democratic societies have come to take as normal. Insourcing means the importation of working conditions *and lack of rights in and out of the workplace* into the so-called developed world. While the social implications are obvious, the theoretical implications are also significant. Even more than occupational change, such sectoral change shows that the optimistic picture of the Knowledge-Based-Society rests on very weak foundations.

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### **References**

- Acemoglu, D. (2002).** 'Technical Change, Inequality and the Labor Market' *Journal of Economic Literature* 40: 7-72.
- Andall, J. (2007).** 'Industrial districts and migrant labour in Italy.' *British Journal of Industrial Relations* 45.2 (June): 285-308.
- Anxo, Dominique, Gerhard Bosch and Jill Rubery (eds.) (2010).** *The Welfare State and Life Transitions: A European perspective.* Edward Elgar.
- Applebaum, A. (2003).** *Gulag: A history of the Soviet Camps.* London: Allen Lane.
- Autor, D.H., F. Levy, R.J. Murnane (2003).** 'The skill content of recent technological change: An empirical exploration.' *Quarterly Journal of Economics* 118.4: 1279-1333.
- Bell, Daniel (1973).** *The Coming of Post-Industrial Society* Penguin.

**Bosch, Gerhard, Alexandra Wagner (2004).** 'Economies de services en Europe et raisons de la croissance de l'emploi en services.' *Sociologie du travail* 46, pp. 451-475.

**Bosch, Gerhard, Steffen Lehndorff, Jill Rubery (eds.) (2009).** *European Employment Models in Flux*. London: Palgrave Macmillan.

**Brown, Philip, Anthony Hesketh with Sara Williams (2004).** *The mismanagement of talent: Employability and jobs in the knowledge economy*. Oxford UP.

**Buggeln, Marc (2008).** 'Were concentration camp prisoners slaves? The possibilities and limits of comparative history and global historical perspectives.' *International Review of Social History* 53: 101-129.

**Butler, Tim; Chris Hamnett, Mark Ramsden (2008).** 'Inward and upward: marking out social class change in London 1981-2001.' *Urban Studies* 45.1: 67-88.

**Ceccagno, A. (2003).** 'New Chinese migrants in Italy' *International Migration* 41.3: 187-214.

**Ceccagno, A. (2007).** 'Compressing personal time: Ethnicity and gender within a Chinese niche in Italy.' *Journal of Ethnic and Migration Studies* 33.4: 635-654.

**Cohen, S. (2008).** 'Modern migrants and new slaves'. *Trends in Social Cohesion* no. 20, pp. 63-90. Strasbourg: Council of Europe.

**Dikootter, Frank (2010).** *Mao's Great Famine*. London: Bloomsbury.

**Dolton, P., P. Pelkonen, (2008).** 'The wage effects of computer use: Evidence from WERS 2004' *British Journal of Industrial Relations* 46.4: 587-630.

**Doogan, Kevin (2009).** *New Capitalism? The transformation of work*. Cambridge: Polity.

**European Commission (2010).** 'Europe 2020: A European strategy for smart, sustainable and inclusive growth.' Brussels: European Commission COM2010 (2020).

**Finegold, David, David Soskice (1988).** 'The failure of training in Britain: Analysis and prescription'. *Oxford Review of Economic Policy* 4.3: 21-53.

**Fitzgerald, I., J. Hardy (2010).** 'Thinking outside the box'? Trade union organizing strategies and polish migrant workers in the United Kingdom.' *British Journal of Industrial Relations* 48.1: 131-50.

**Florida, Richard (2004).** *The Rise of the Creative Class: And how it's transforming work, leisure community and everyday life*. NY: Basic Books. (first published 2002).

**Forde, C., R. Mackenzie (2009).** 'Employers' use of low-skilled migrant workers: Assessing the implications for human resource management.' *International Journal of Manpower* 30.5 (14 August): 437-452.

**Froehle, Rainer (1998).** 'KZ Haeftlinge als Reserver qualifizierter Arbeitskraft...' Ulrich Herbert et al eds., *Die nationalsozialistischen Konzentrationslager...* Goettingen: Wallstein, II, 736-681.

**Galle, D., A. Felstead, F. Green (2003).** 'Skill, task discretion and new technology: Trends in Britain 1986-2001.' *Année Sociologique* 53.2: 401-430.

**Gangmasters Licensing Authority (2011).** <http://gla.defra.gov.uk/> Last accessed 1 July, 2011.

**Glenny, Misha (2007).** *McMafia: A journey through the criminal underworld*. London: Bodley Head.

**Goodhart, David (2011).** 'A tale of three cities' *Prospect* (July, 2011), pp. 36-42.

**Goos, M., A. Manning (2007).** 'Lousy and Lovely Jobs: The rising polarization of work in Britain.' *Review of Economics and Statistics* 89.1: 118-33.

**Goos, M., A. Manning, A. Salomons (2009).** 'Job polarization in Europe.' *American Economic Review* 99.2: 58-63.

**Green, F., A. Felstead, D. Gallie. (2003).** 'Computers and the changing skill intensity of jobs' *Applied Economics* 35.14: 1561-1576.

**Hall, Peter A., David Soskice (2001).** 'An Introduction to Varieties of Capitalism'. Hall and Soskice eds., *Varieties of Capitalism*, Oxford UP, pp. 1-68.

**Hamnett, C. (1996).** 'Social polarisation, economic restructuring and welfare state regimes.' *Urban Studies* 33.8: 1407-1430.

**Katz, L.F., D.H. Autor (1999).** 'Chapter 26 Changes in the wage structure and earnings inequality.' *Handbook of Labor Economics* Vol 3. issue 1: 1463-1555.

**Kerr, Clark et al (1973).** *Industrialism and Industrial Man*. (first published 1960). Harmondsworth: Penguin.

**MacKenzie, Donald (1991).** *Inventing Accuracy: A Historical Sociology of Nuclear Missile Guidance*. MIT Press.

**MacKenzie, R., C. Forde (2009).** 'The rhetoric of the 'good worker' versus the realities of employers use and the the experience of migrant workers.' *Work Employment and Society* 23.1: 142-159.

**Mallet, Victor, Guy Dimone (2011)** 'Europe: Hidden Economy'. *Financial Times*, 8 June.

**Martin, Philip L. (2009).** *Importing Poverty? Immigration and the Changing Face of Rural America*. New Haven: Yale UP.

**Naticcioni, P., A. Ricci, E. Rustichelli (2008).** 'Wage inequality, employment structure and skill-biased change in Italy.' *Labour* 22 (SUPPL 1): 27-51.

**Nolan, P., G. Slater (2010).** 'Visions of the future, the legacy of the past: demystifying the weightless economy.' *Labor History* 51.1: 7-27.

**Rabellotti, R., A. Carabelli, G. Hirsch (2009).** 'Italian industrial districts on the move: Where are they going?' *European Planning Studies* 17.1: 19-41.

**Reich, Robert (1993)** *The Work of Nations: Preparing Ourselves For 21st Century Capitalism*. London: Simon & Schuster [1st ed NY: 1991].

**Reyneri, Emilio (2004).** 'Immigrants in a segmented and often undeclared labour market.' *Journal of Modern Italian Studies* 9.1: 71-93.

**Ritzer, George (1995).** *The McDonaldization of Society. An investigation into the changing character of contemporary social life*. London: Pine Forge. Revised ed. First pub 1993.

**Ross, Martin, Bridget Anderson (eds.) (2010).** *Who needs migrant workers?* Oxford UP.

**Sassen, Saskia (1996).** 'Service Employment Regimes and the New Inequality' Mingione ed., *Urban Poverty*, Oxford: Blackwell, pp. 64-82.

**Saviono, Roberto (2007).** *Gomorra: Italy's other mafia*. London: Macmillan.

**Spoerer, M., J. Fleischhacker (2002).** 'Forced laborers in Nazi Germany: Categories, numbers and survivors.' *Journal of Interdisciplinary History* 33.2: 169-204.



**Wagner, Jens-Christian (1998).** 'Das Aussenlagersystem des KL Mittelbau-Dora' Herbert et al eds, Die nationalsozialistischen Konzentrationslager..., Goettingen: Wallstein, pp. 707-729.

**Waldinger, R., M.I. Lichter (2003).** How the other half works: Immigration and the social organisation of labor. Berkeley: California UP.

**Wickham, James (1997).** 'Who Wants What Where? Part-Time Work in Ireland and Europe'. Work Employment and Society 11.1 (March): 133-155.

**Wickham, James, Gráinne Collins (2004).** 'The call centre: A nursery for new forms of work organisation?' Service Industries Journal 24.1 (January): 1-18.

**Wickramasekara, Piyasiri, Jag Sehgal, Farhad Mehran, Ladan Noroozi, Saeid Eisazedah (2006).** Afghan households and workers in Iran: Profile and impact Final Report. Geneva: International Labour Office.

**Wilczek, Barbara, Eddy Donnelly, Paul Freedman (2009).** 'Choice and constraint in migrant worker acculturation: towards a new approach.' Is Güte: Industrial Relations and Human Resources Journal [Turkey] 11.5: 25-49.

**Wyatt, I.D., D.E. Hecker (2006).** 'Occupational changes during the 20th century.' Monthly Labor Review 129.3: 35-57.

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