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**British Relative Economic Decline Revisited**

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# **British Relative Economic Decline Revisited**

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Abstract

This paper examines the role of competition in productivity performance in Britain over the period from the late-nineteenth to the early twenty-first century. A detailed review of the evidence suggests that the weakness of competition from the 1930s to the 1970s undermined productivity growth but since the 1970s stronger competition has been a key ingredient in ending relative economic decline. The productivity implications of the retreat from competition resulted in large part from interactions with idiosyncratic British institutional structures in terms of corporate governance and industrial relations. This account extends familiar insights from cliometrics both analytically and chronologically.

Keywords: competition; productivity; relative economic decline

JEL Classification: N13; N14; O52

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## **1. Introduction**

For a century or more through the 1970s, Britain experienced relative economic decline. In terms of real GDP per head, other countries caught up and then overtook Britain. That is well-known to economic historians. Perhaps less widely recognized is that in the late twentieth century Britain recovered so that by 2007, on the eve of the crisis, real GDP per head was just above French and West German levels. Table 1 summarizes these trends and shows the 1950s through the 1970s as the period when British relative economic performance relative to its European peer group was weakest.

This paper seeks to highlight the role that competition in product markets, or the lack of it, played in British relative economic decline by providing a perspective over the long twentieth century from the 1890s to the early 2000s. This is not to suggest that competition was the only or necessarily the most important explanation but to propose that focusing on competition is to draw attention to an aspect of the British economy that deserves more prominence in the economic history literature, in particular because it interacts with corporate governance and industrial relations in producing productivity outcomes. Understanding this not only provides coherence to what otherwise seem unconnected or even irrational explanations for British relative decline but also is central to an account of British economic growth performance over time that takes history seriously.

The importance of competition as an antidote to bad business management was given considerable prominence by new economic historians in the famous debate about the alleged failure of the British economy prior to World War I (McCloskey and Sandberg, 1971). But cliometricians have not really followed up the implications of the flipside of this insight with regard to the subsequent performance of the British economy in periods characterized by weaker competition. It is timely to do so because growth economics both in terms of theory (Aghion and Howitt, 2006) and applied research by influential organizations such as OECD (Nicoletti and Scarpetta, 2005) has come to see as competition as a serious driver of better productivity outcomes, in particular through the incentive structures that face firms.

In the rest of this paper, after reviewing some recent work in economics on competition and productivity performance, I shall develop the argument that the weakness of competition in product markets in the British economy from the 1930s to the 1970s was fundamental to British relative economic decline. This period will be contrasted both with what went before and with what came after in order to provide a new long-run perspective on British relative economic performance.

## **2. Competition and productivity performance**

Economic theory gives somewhat ambiguous messages about the impact of competition on productivity performance. A common and powerful line of argument is that competition is an effective antidote to principal-agent problems within firms that involve managers whose

interested are imperfectly aligned with owners failing to minimize costs with adverse effects on productivity. In this context, weak shareholders who face free-rider problems in monitoring management find competition helpful in devising contracts that incentivize managers appropriately while competition also raises the sensitivity of profits to managerial actions (Nickell, 1996). Alternatively, product market competition reduces slack and acts as a disciplinary device fostering the adoption of new technology. In an endogenous growth framework this can have productivity growth rate rather than just level effects (Aghion et al., 1997). It is, however, possible to devise models in which an intensification of product market competition leads to a reduction of managerial effort (Scharfstein, 1988; Martin, 1993). Ultimately, this is an empirical issue.

The same remark applies to the impact of competition on innovation. Here, the classic so-called 'Schumpeterian' argument was that ex-ante market power encourages innovation because it enhances the expected appropriability of profits. Against this is the 'Hicksian' possibility that market power allows management to be sleepy and the point that firms gain more from innovating in an industry which is competitive ex-ante if profits are perfectly appropriable ex-post (Fellner, 1951). A combination of the Hicksian and Schumpeterian positions might suggest that the relationship between market power and innovation has an inverted-U shape. Recently, a sophisticated variant of these arguments has proposed that entry threats encourage innovation by firms close to the technological frontier who can protect their rents but discourage innovation by firms far from the frontier who will succumb to entry whether or not they innovate (Aghion and Howitt, 2006). This proposition generates the prediction that competition policy, especially de-regulation of entry, is increasingly good for growth as countries become more advanced.

Product-market competition also has implications for productivity outcomes through industrial relations. The existence of supernormal profits is the basis on which trade unions can promise rewards for membership (Brown, 2008). The profits resulting from market power are typically shared with workers depending on bargaining power (Blanchflower et al., 1996). But workers may also bargain for lower work effort (overstaffing) when there are rents available to be shared. If this is the form that bargaining takes, then it is straightforward to produce models which predict that increased competition will improve productivity performance (Haskel, 1991; Machin and Wadhvani, 1989).

Even if theoretical predictions are ambiguous, the empirical evidence is clear that there is a strong positive relationship between competition and productivity performance, in particular because agency problems are mitigated. Competition improved productivity performance in both British and German firms in the 1990s (Koke and Renneboog, 2005), tighter regulation that reduced entry in European markets raised mark-ups and lowered labour productivity growth (Cincera and Galgau, 2005), and good competition policy has had a strong impact on TFP growth in OECD countries (Buccirosi et al., 2009). Turning

specifically to principal-agent problems, competition promotes good management practices which in turn pay off in improved productivity outcomes (Bloom and van Reenen, 2007).

With regard to innovation, a recent survey of the evidence concluded that, on balance, it points to a positive effect of competition; this was reinforced by the authors' own research which showed that the European Single Market Programme had raised competition and that, in turn, this had increased R and D investments (Griffith et al., 2006). There is evidence for the UK of an inverted U shape in the relationship between market power and patenting but the peak is at a low price-cost margin (Aghion et al., 2005). Foreign-firm entry in the UK following liberalization has resulted in increased patenting and productivity growth but only in industries close to the technology frontier (Aghion, Blundell et al., 2009a). More generally across countries, reducing regulation that inhibits competition has positive (negative) effects on TFP growth in close to (far from) the frontier countries (Aghion, Ashkenazy et al., 2009).

The evidence on the relationship between product market competition and industrial relations outcomes in Britain is also quite well established. Stewart (1990) found that mean union pay differentials were 8 to 10% in industries where there was market power but zero with competition. Metcalf (2002) found that union bargaining reduced labour productivity significantly in industries with limited competition but had no effect otherwise.

Overall, this review of the evidence indicates that we might expect that weak competition would have adverse effects on British productivity performance. This would be more likely to be serious if firms were exposed to principal-agent problems arising in the control of managers by shareholders and/or if trade unions were in a strong position to bargain for low effort levels.

### **3. Before 1914**

The performance of the British economy in the decades before World War I was a cause celebre for the new economic history in the late 1960s and early 1970s. Writers in this tradition attacked widespread claims of entrepreneurial failure, most notably from Landes (1969), in particular by investigating the choice of technology from a profit-maximizing perspective, and generally found that the decisions were rational (Magee, 2004). The most bullish assessment came from McCloskey who saw "a picture of an economy not stagnating but growing as rapidly as permitted by the growth of its resources and the effective exploitation of the available technology" (1970, p. 459).

A clear implication of this debate was that international comparisons of productivity were the ultimate performance test. In this respect, the evidence base is now much improved. The estimates in Table 2 show that in terms of whole-economy TFP the UK was still ahead of its main rivals in 1911. In industry, the picture was less favourable with the USA well ahead, as it had been in 1869. Close examination suggests that this should not be construed as a

British failure but as the direct and indirect result of American geography which underwrote scale economies and energy-intensive production together with a distinctive style of technological advance which was not appropriate for European countries (Crafts, 1998). Econometric evidence underlines the importance of bias towards raw-material use in technological change in American manufacturing together with the prevalence of scale economies (Cain and Paterson, 1986).

The evidence on TFP growth is a bit more ambiguous than McCloskey (1970) believed. At the end of the nineteenth century, TFP growth accelerated in the United States which achieved a hitherto unprecedented rate (Table 3). By the 1920s, American technological progress was underpinned by much larger investments in intangible and human capital formation (Abramovitz and David, 2001) and by 1929 the United States had established a clear TFP lead. American TFP performance was not matched by Britain and to some extent this may reflect failings in education and technology policy. McCloskey assumed that Britain could not have anticipated the American move to faster technological change, a prior which endogenous-growth economists might not share.

In the early twentieth century, the British economy is always seen as one where competition generally prevailed in product markets. Hannah stated: "It is a commonplace that in the course of the present century British industry has witnessed a transformation from a disaggregated structure of predominantly small competing firms to a concentrated structure dominated by large and often monopolistic corporations" (1983, p. 1) and he estimated the share of the largest 100 firms in manufacturing as only 15% of output (1983, p. 3). Magee described competition in the manufacturing sector as 'generally intense' (2004, p. 79) which echoes the assessment by Broadberry that "in most industries competitive forces acted as a spur to efficiency, with existing rivals or new entrants ready to take up opportunities neglected by incumbent producers" (1997c, p. 157). Profit rates seem to support these views; Davis and Huttenback (1986) found that owners' rate of return on assets averaged 8.9% in the industrial and commercial sector from 1890 to 1913.

The stance of supply-side policy might be regarded as quite 'laissez-faire'; there was neither competition policy nor selective industrial policy. Britain was an enthusiastic participant in globalization. There were no restrictions on international capital mobility and British tariff policies were close to free trade; Lehmann and O'Rourke (2008) estimated that average tariffs on manufactures (measured by customs revenues/imports) were around 3% in the years just prior to World War I and on agricultural goods were about 1%. Policy-made barriers to entry against foreign producers were therefore negligible.

It is a staple of the literature that the only well-established failure to adopt cost-effective new technology, namely not to switch from the Leblanc to the Solvay process in soda manufacture, was in a cartelized activity and this is seen as underlining the point that competition was an antidote to entrepreneurial failure (Magee, 2004). In the most-studied choice of technology, that between ring spinning and mule spinning in cotton textiles, the

evidence seems clear-cut that the British industry was rational to stick with mule spinning for the vast majority of its production (Leunig, 2001). In addition, however, this industry can be seen as a case of something very close to perfect competition where policymakers allowed market forces to drive geographic concentration in Lancashire which delivered external economies of scale that underpinned a continuing productivity lead over American producers and an ability to compete on world markets against low-wage Asian suppliers (Leunig, 2003).

Policies of openness served Britain well. British investors gained significantly from foreign investment which allowed diversification of portfolios to permit considerably better risk-return trade-offs (Chabot and Kurz, 2010; Goetmann and Ukhov, 2006). Econometric analysis of the relationship between exposure to trade and level of income indicates a strong positive effect in this era (Jacks, 2006); taking a conservative view of his results would suggest that a higher trade to income ratio was worth an income gain to Britain of at least 10 per cent compared with Germany in 1913.

Nevertheless, it might be argued on the lines set out by Richardson (1965) that Britain would have benefited from infant-industry policies designed to boost new, technologically progressive industries which were to some extent crowded out by the strength of Britain's traditional export sectors. This proposition seems unpersuasive, however, for a number of reasons. First, this presumes capital market failures which are at the very least highly contentious (Michie, 1988). Second, it would have done nothing to help the services sector which in the long-term was the locus of American out-performance in productivity growth (Irwin, 2001). Third, the political economy of tariff protection was such that the proposals that had the most political support such as those made by Chamberlain would have actually tended to divert activity towards traditional sectors such as agriculture and textiles rather than new growth industries (Thomas, 1984). Finally, if the real problem was market failures that implied too little investment in human capital and R & D, then the right response was policy interventions to address these failures directly.

Although the new economic history has largely succeeded in rejecting claims of failure in the pre-1914 British economy, it is important to recognize that complete exoneration would be going too far. For example, railways was a major sector whose performance was clearly inadequate – even Cain, a sympathetic observer, accepted that “there was waste and inefficiency in the railway system of Great Britain between 1870 and 1914” (1988, p. 120). Crafts et al. (2008) quantified the excess of actual over minimum feasible costs for a sample of 14 major railway companies and concluded that median cost inefficiency was 10.2% in 1900, equivalent to about 1% of GDP.

Two salient features of the railway sector were that competition was weak and so were shareholders in companies that were notable for the separation of ownership and control. By the early twentieth century, there were very high barriers to entry in an activity that was not internationally tradable and also significant attempts at collusion although, as outbursts



of expensive rivalry in terms of quality of passenger service illustrated, joint profit maximization was typically not achieved. Major railway companies had large numbers of small shareholders and voting rules that ensured that boards of directors and professional managers were very securely entrenched (Hannah, 2007). The key point is that this set-up implied that railway managers had considerable scope to pursue their own objectives and to fail to minimize costs at least while profits remained 'acceptable' (Cain, 1988). In fact, after 1900, profits became squeezed in the face of regulation of freight charges and rising costs and, as principal-agent models of the firm might predict, managers acted to improve operating efficiency (Irving, 1976); median cost inefficiency in British railway companies fell to 2.6% by 1910 (Crafts et al., 2008).

This example should not be taken as typical of the pre-1914 economy; on the contrary, railways were something of an outlier both in terms of barriers to entry and the degree of separation of ownership and control (Cheffins, 2008). However, while railways were the exception in 1900, cases of weak competition together with weak shareholders would become all too common after 1950. So, we may see railways as a harbinger of problems that would impair British economic performance in the decades of acute relative economic decline during the long post-war boom.

#### **4. The interwar period**

The interwar period was a difficult time for the British economy and its policymakers. Obviously, Britain was exposed to the macroeconomic shock of the Great Depression but throughout the 1920s and 1930s there were major adjustment problems arising from the difficulties of the Victorian export-staple industries; Britain was distinctly vulnerable to the globalization backlash. The upshot in the 1930s was a major shift in British economic policy which entailed a substantial, and long-lasting, retreat from competition.

Faced with world deflation, the coalition government pursued a 'managed economy' strategy to restore profitability by raising prices relative to wages (Booth, 1987). This included leaving the gold standard in 1931, imposing a general tariff on manufacturing in 1932, and, in the continuing absence of any anti-trust policy, increasingly encouraging cartels and collusive behaviour. To address the politically embarrassing problems of declining industries in 'outer Britain', an embryonic industrial policy emerged which included not only tariff protection but also subsidies for economic activity in Special Areas and Acts to promote 'rationalization' under government-sanctioned cartels in coalmining (1930) and cotton (1939). This was, of course, definitely not an 'infant-industry' approach to intervention; in fact, the largest increases in effective protection went to 'old' industries such as hosiery & lace and railway rolling stock (Kitson et al., 1991).

As might be expected, the interwar economy exhibits symptoms of a considerable increase in market power. By 1935, the share of the largest 100 firms in manufacturing output had risen to 23% following a merger boom in the 1920s; growing industrial concentration and

increased barriers to foreign entry greatly strengthened domestic cartels (Hannah, 1983). Mercer (1989) showed that by 1935 at least 29 per cent of manufacturing output was cartelized. A proxy for the price-cost margin  $[(\text{value-added} - \text{wages})/\text{value added}]$  calculated from the Census of Production shows an average increase of 3.8 percentage points across manufacturing sectors (from 0.563 to 0.601) from 1924 to 1935 while in the sectors identified by Mercer as cartelized the increase was 9.0 percentage points. An econometric study by Henley (1988) found that the coal cartel raised the price-cost margin by 13.8 percentage points. Hart (1968) estimated that the rate of return on capital employed for manufacturing companies had risen to 16.2% by 1937 from 11.4 % in 1924.

The performance of the British economy in the 1930s, when there was an early and strong recovery from the depression, has sometimes been viewed quite favourably, especially by writers sympathetic to the view that Britain failed in the pre-1914 period. For example, in a widely-used textbook, Pollard stated: "The view that, after a poor performance in the 1920s, the 1930s saw a genuine breakthrough, is indeed widespread and finds support not only in the output statistics but also in the quality of the modern investment and the structuring of British industry towards the growth-oriented sectors" (1983, p. 53). This relatively optimistic interpretation has its roots in the thesis, originally argued by Richardson, of a regeneration of the economy through the productivity advance of 'new' industries and in the strong emphasis that Matthews et al. (1982) placed on the revival of TFP growth following a climacteric in the early twentieth century.

These views appear to be supported by the estimates in Tables 1 and 2 which show the gap with the United States narrowing but the comparisons reported there are distorted by different rates of recovery from depression. Indeed, a closer look suggests that 1930s' British productivity performance was rather disappointing. The most obvious point to make is that the growth rate of real GDP and TFP between 1929 and 1937 fell back from that of 1924 to 1929 and was lower than in 1873 to 1899 (Crafts, 2004, Table 1.5). Time series econometric analyses do not indicate a break in 1929 either in GDP or industrial production growth (Mills, 1991; Greasley and Oxley, 1996). TFP growth remained well below the standard set by the United States during the first half of the twentieth century with R & D still only around 0.3 to 0.5 percent of GDP (Edgerton and Horrocks, 1994). On an hours-worked basis, the labour productivity gap between Britain and the United States in manufacturing continued to widen, as Table 4 reports.

Moreover, there is no evidence that the retreat from competition in the 1930s was good for productivity performance; if anything, the opposite is the case. Kitson and Solomou (1990) suggested that the interwar tariff had positive effects for manufacturing, at least in the short term, as activity revived. They reported that labour productivity growth in industries that were newly-protected in 1932 showed an increase of 2.28 percentage points in 1930-5 relative to 1924-30 compared with 0.03 percentage points in the non-newly protected industries. This analysis can be refined by considering three-way split between industries

already protected through tariffs imposed in the 1920s ('Early'), those receiving no protection or the basic nominal rate of 10 per cent in 1932 (and were not generally exposed to import competition), and those which were given enhanced protection at rates between 20 and 33 percent ('Additional'), based on the information given in Hutchinson (1965) and Sebag-Montefiore (1943). It is also instructive to consider a longer time period using the information on labour productivity in Brown (1964) such that the effects of insulation from competition on managerial incentives to control costs are more likely to show through.

The regression results obtained for differences in labour productivity growth were as follows (t-statistics in parentheses):

$$1930/35 - 1924/30 = 0.733 + 1.321 \text{ Additional} - 0.974 \text{ Early}$$

$$(1.026) \quad (1.384) \quad (-0.762)$$

$$1935/48 - 1924/35 = -1.228 + 0.109 \text{ Additional} - 1.843 \text{ Early}$$

$$(-2.993) \quad (0.200) \quad (-2.510)$$

Granting additional protection in 1932 had a positive but insignificant effect on productivity growth in the short-run and a negligible impact in the longer run. However, the difference in productivity growth for 1935/48 compared with 1924/35 is significantly negative and large for industries that had experienced a prolonged period of protection. There is nothing in these results to suggest that protectionism was a supply-side policy that had long-run benefits for productivity performance.

Broadberry and Crafts (1992) examined the impact of reduced competition on [productivity performance. Controlling for other variables, they found a negative correlation between changes in the price-cost margin and productivity performance for a cross-section of British industries in the period 1924 to 1935 and that British industries which had a high 3-firm concentration ratio had lower labour productivity relative to the same industry in the United States in 1935/7. They also presented a number of case studies which led them to conclude that cartelization, weak competition and barriers to entry had adverse implications for productivity outcomes. It is also clear that government-sponsored restraint of competition in coal (Supple, 1987), cotton (Bamberg, 1988) and steel (Tolliday, 1987) were ineffective in promoting productivity improvement through rationalization although this was supposedly key policy objective.

## 5. The 'golden age'

The period 1950 to 1973 is conventionally known as the 'golden age' of European economic growth. This was an episode of rapid catch-up growth during which western European economies rapidly reduced the large productivity gap which the United States had established by 1950. Abramovitz and David (1996) suggested European catch-up was based on enhanced 'social capability' (better incentive structures) and improved 'technological congruence' (American technology became more cost effective in European circumstances)

compared with the interwar period. This meant there was a much greater opportunity for catch-up and European countries were better able to take advantage.

During these years, Britain experienced its fastest-ever economic growth but at the same time relative economic decline proceeded at a rapid rate vis-a-vis its European peer group such that by the end of the period Britain had been overtaken by seven other countries in terms of real GDP per person and by nine others in terms of labour productivity. UK growth was slower by at least 0.7 percentage points per year compared with any other country including those who started the period with similar or higher income levels (Table 5). Although slower growth can be partly explained by virtue of a higher initial level of income and productivity, being overtaken by France and West Germany is a clear indicator of avoidable failure. This is confirmed by an unconditional growth regression for a cross-section of regions within European countries in 1950-73 reported by Crafts and Toniolo (2010):

$$\begin{aligned} \text{GYP} = & 5.292 - 0.029 \text{ Initial Level} + 0.920 \text{ Spain} + 1.046 \text{ West Germany} - 0.833 \text{ UK} \\ & (17.567) \quad (-7.521) \qquad \qquad (3.537) \qquad \qquad (4.346) \qquad \qquad (-3.539) \\ & + 0.716 \text{ Italy} + 0.169 \text{ France} \qquad \qquad R^2 = 0.870 \\ & (3.017) \qquad \qquad (0.766) \end{aligned}$$

where the omitted-country dummy variable is Netherlands. This suggests that there was a growth failure of about 0.8 percentage points per year cumulating to an income shortfall of almost 20 per cent by 1973.<sup>1</sup>

A major reason for slow labour productivity growth was weak TFP growth, as is clear from Table 3. Maddison (1996) attempted a decomposition of the sources of TFP growth and he concluded that the shortfall in Britain could not be explained away by lower scope for catch-up or the structure of the economy although clearly very rapid TFP growth in countries like West Germany did reflect reconstruction, reductions in the inefficient allocation of resources, and lower initial productivity (Temin, 2002). The clear inference is that early-Elizabethan Britain did fail and this is confirmed by France and West Germany overtaking the UK in productivity levels in the market sector by the 1970s, as is reported in Table 6.

In the early postwar years, supply-side policy continued along the trajectory established in the 1930s. Protectionist policies were sustained, competition policy was neglected, and there was recourse to industrial policy to support selected sectors. In addition, 10 per cent of GDP was taken into public ownership which typically entailed a state monopoly. This amounted to a policy stance which was conducive to weak competition in product markets.

Table 7 underlines the slowness of the retreat from protectionist policies. Average tariff rates for UK manufacturing remained at 1930s levels until the early 1960s and were

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<sup>1</sup> This is large enough to be a real cause for concern but it is also fair to say that 'decline' is an ideological construct which has been associated with the politicization of economic policy (Tomlinson, 1996).

considerably higher than those in West Germany in the late 1950s. Trade costs remained above the 1929 level until the 1970s when trade liberalization under the GATT and entry to the EEC drove them down; the contrast with countries which signed the treaty of Rome in 1957 is apparent. Industrial policies were skewed to protecting ailing industries both through subsidies (Wren, 1996), and tariffs (Greenaway and Milner, 1994).

Competition policy was inaugurated with the Monopolies and Restrictive Practices Commission in 1948, evolved through the Restrictive Practices Act (1956) and the Monopolies and Mergers Commission (1965), but was mostly ineffective (Clarke et al., 1998). Few investigations took place, very few mergers were prevented, the process was politicized, a variety of 'public-interest' defences for anti-competitive activities were allowed, and there were no penalties for bad behaviour. Only the Restrictive Practices Act had teeth but its attack on collusion was ultimately undermined by cartels being superseded by mergers.

Not surprisingly, there is evidence that the British economy was characterized by substantial market power in this period. Initially, collusive activity was widespread; an examination of the agreements registered in compliance with the 1956 Act shows that only 27 per cent of manufacturing was free of price-fixing and 35.7 per cent was cartelized (Broadberry and Crafts, 2001). Over time, industrial concentration increased steadily such that the average CR3 across manufacturing sectors was 41 per cent by 1968 compared with 26 per cent in 1935 (Clarke, 1985) and the share of the 100 largest firms in manufacturing output reached 40 per cent by 1970 (Hannah, 1983). Crafts and Mills (2005) estimated that the price-cost margin in British manufacturing during 1954-73 averaged over 2 compared with around 1.1 in West Germany which is consistent with the finding in Geroski and Jacquemin (1988) that the magnitude and persistence of supernormal profits for large firms during 1949 to 1977 was large in the UK but that significant deviations from competitive outcomes were not observed in West Germany in the 1960s and 1970s.<sup>2</sup>

The evidence on the rate of return on capital is a bit more difficult to interpret. Hart (1968) reported that for the manufacturing sector this peaked at 18.4 per cent in 1951 but had fallen to 14.2 per cent 10 years later and 10.3 per cent by the late 1960s (Hill, 1979) after which the 1970s saw a 'profits crisis'. However, wage bargaining in Britain involved 'rent-sharing' with workers extracting an increasing fraction of the rents as early postwar wage restraint was replaced by labour militancy and workers exploited their bargaining power. Workers may have been able to convert around 30 per cent of quasi-rents into a wage premium (van Reenen, 1996), in which case the rate of profit in the late 1960s may well have been similar to the later 1930s.

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<sup>2</sup> The existence of significant market power in the UK but not in West Germany at this time is confirmed by the similarity of the primal and dual measures of TFP in the latter but not in the former; see Crafts and Mills (2005) for further elaboration.

The weakness of competition in product markets had potential implications for productivity performance through its interaction with institutions. First, Britain entered the postwar period with an idiosyncratic and unreformed system of industrial relations characterized by craft control, multi-unionism, legal immunities for trade unions, and strong but decentralized collective bargaining reflected in increasing trade union density and the proliferation of shop stewards (Crouch, 1993). These arrangements in conditions of full employment and weak competition gave trade unions bargaining power and rents to extract while exposing sunk-costs investment to 'hold-up' problems.

Second, corporate governance in postwar Britain was notable for a strongly increasing tendency to the separation of ownership and control, where dominant ownership interests became much less common, which also made it a real outlier within Europe. This reflected the demise of family control, the dilution of equity holdings through mergers, and a tax system which discouraged individual but favoured institutional investors (Cheffins, 2008). Given that the market for corporate control through takeovers did not work effectively as a constraint (Cosh et al., 2008), the weakness of competition allowed considerable scope for managerial underperformance.

The evidence on lack of competition and British productivity performance during the Golden Age both shows an adverse effect and also that this worked at least partly through industrial relations and managerial failure. Broadberry and Crafts (1996) found that cartelization was strongly negatively related to productivity growth in a cross section of manufacturing industries for 1954-63. This result is borne out by the difference-in-differences analysis in Symeonidis (2008) who showed that when cartels were abandoned following the 1956 Restrictive Practices Act labour productivity growth in formerly-colluding sectors rose by 1.8 percentage points per year in 1964-73 compared with 1954-63. This finding suggests that a more vigorous competition policy would have improved productivity performance.

Case studies strongly implicate bad management and restrictive labour practices resulting from bargaining with unions in poor productivity outcomes. Pratten and Atkinson (1976) reviewed 25 such studies and found either or both of these problems in 23 of them. Prais (1981) reported similar findings in 8 out of 10 industry case studies and in each case noted that competition was significantly impaired. He also pointed to the strong tendency for industrial-relations problems to lead British management to avoid large plants.

Finally, econometric analysis found that in the 1970s and 1980s greater competition increased innovation (Blundell et al., 1999; Geroski, 1990) and raised productivity growth significantly in companies where there was no dominant external shareholder (Nickell et al., 1997). In this (typical) case, increases in interest payments relative to cash flow also promoted faster productivity growth. Both these results underline the role of weak competition in permitting agency-cost problems to undermine productivity performance and, at the same time, suggest that the considerable subsidies under the auspices of industrial policies were conducive to poor productivity outcomes.

## 6. From the 1970s to the early 21<sup>st</sup> Century

After the golden age, European productivity growth slowed down markedly but less so in the UK than in most other countries. Table 1 reported that British relative economic decline with respect to its large continental European rivals came to an end in this period. By 2007, the UK had a slightly higher real GDP per person than either France or the former West Germany. In considerable part, this reflected greater employment and longer hours worked as UK labour productivity was still lower than in the other two countries. Nevertheless, by 2007, relative productivity performance had recovered somewhat from the low point reached at the end of the 1970s, as Table 6 reports. In fact, Table 6 significantly understates the extent of relative improvement in the UK since it does not allow for the implications of the labour-market distortions which underlie the differences in labour inputs.<sup>3</sup>

As we shall see, looking at this post-golden-age episode is helpful as a test of the interpretation of the earlier period given above. Insofar as relative TFP performance improved, this was largely through reductions in inefficiency in the use of factors of production in the UK and not through stronger R & D. After the mid-1990s, capital per hour worked grew more quickly in the UK than in France and Germany. Table 8 shows that this was a result of much stronger investment in ICT capital in the UK. Both these aspects were responsive to increases in competition and product-market deregulation.

Despite further nationalizations in the 1970s, after the golden age, government policy generally moved in the direction of increasing competition in product markets. In particular, protectionism was discarded with liberalization through GATT negotiations, entry into the European Community in 1973, the retreat from industrial subsidies and foreign exchange controls in the Thatcher years, and the implementation of the European Single Market legislation in the 1990s. The average effective rate of protection fell from 9.3% in 1968 to 4.7% in 1979, and 1.2% in 1986 (Ennew et al., 1990), subsidies were reduced from £9bn (at 1980 prices) in 1969 to £5bn in 1979 and £0.3bn in 1990 (Wren, 1996), and import penetration in manufacturing rose from 20.8% in 1970 to 40.8% by 2000 (Batchelor et al., 1980; Criscuolo et al., 2004). The process of trade liberalization reduced price-cost margins (Hitiris, 1978; Griffith, 2001).

The 1980s and early 1990s were a period of de-regulation (notably of the financial sector) and privatization. OECD measures of competition-inhibiting product market regulation (PMR) reported in Table 9 show the UK moving to a liberalized position and indeed by 1998 it had the lowest PMR score among OECD countries. Anti-trust policy was neglected during

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<sup>3</sup> In 2007 the employment to working-age population ratio was 66.3% in UK, 65.9% in USA, 62.9% in Germany and 59.8% in France. In the lower employment countries, low-productivity workers were disproportionately excluded from employment by institutional arrangements. There were also big differences in hours worked with the UK and USA much higher than France or Germany. Normalizing for these differences is difficult but would probably have a substantial impact, as the work of Bourles and Cette (2007) suggests. Using their formula, the UK-France and the UK-Germany labour productivity gap in 2007 would be, respectively, about 6 and 8 percentage points lower. These discrepancies were tiny in the early 1970s.

those years but was notably strengthened by the Competition Act of 1998 and the Enterprise Act of 2003 which increased the independence of the competition authorities, removed the old 'public-interest' defence, and introduced criminal penalties for running cartels. The index of competition policy reported in Table 9 show that British competition policy was still very weak by international standards in 1995 but much stronger ten years later.

Not surprisingly, the evidence suggests that market power in the UK economy has fallen considerably since the 1970s. The average 5-firm concentration ratio based on sales adjusted for imports was only 24 per cent in 1989 compared with 42 per cent in 1968 and 30 per cent in 1980 (Clarke, 1993). Two independent methods of estimating the price-cost margin in manufacturing both indicate that by 1995 it was about half the 1971 level (Crafts and Mills, 2011). The downward trend in the mark-up from the 1970s onwards appears to have intensified further after the early 1990s (Macallan et al., 2008). As Table 9 reports, by the late 1990s mark-ups in the UK economy as a whole were relatively low – in fact, OECD estimates suggest that mark-ups in services were the lowest in the OECD (Hoj et al., 2007). The rate of return on capital employed in manufacturing has recovered from the 1970s low and has averaged 10.2 per cent in the last 20 years.

It is also clear that increased competition in the later twentieth century was associated with better productivity performance and that these effects worked at least partly through greater pressure on management to perform and through firm-worker bargains which raised effort and improved working practices. Two papers considered the process of catch-up growth. Proudman and Redding (1998) found that across British industry during 1970-90 openness raised the rate of productivity convergence with the technological leader and, in a study looking at catch-up across European industries, Nicoletti and Scarpetta (2003) found that TFP growth was inversely related to PMR. The implication of a lower PMR score as compared with France and Germany was a TFP growth advantage for the UK of about 0.5 percentage points per year in the 1990s. At the sectoral level, when concentration ratios fell in the UK in the 1980s, there was a strong positive impact on labour productivity growth (Haskel, 1991) and a difference-in-difference analysis showed that the removal of protection in the 1970s is associated with faster productivity growth in the early 1980s (Broadberry and Crafts, 2011). Entry and exit accounted for an increasing proportion of manufacturing productivity growth, rising from 25 per cent in 1980-5 to 40 per cent in 1995-2000 (Criscuolo et al., 2004).

There is strong evidence that increases in competition had effects through reducing managerial failure. Increases in competition resulting from the European Single Market raised both the level and growth rate of TFP in plants which were part of multi-plant firms and thus most prone to agency problems (Griffith, 2001). Nickell et al. (1997) found that a fall of supernormal profits from 15 to 5 per cent of value added raised TFP growth by 1 percentage point in firms without a dominant external shareholder but had no significant



effect where there was such a shareholding. Liberalization of capital market rules allowed more effective competition for corporate control and a notable feature of the period after 1980 was divestment and restructuring in large firms and, in particular, management buyouts (often financed by private equity) which typically generated massive increases in TFP levels in the period 1988-98 (Harris et al., 2005).

The 1980s and 1990s saw major changes in the conduct and structure of British industrial relations. Trade union membership and bargaining power were seriously eroded (Gospel, 2005). This was prompted partly by high unemployment and anti-union legislation in the 1980s but also owed a good deal to increased competition (Brown et al., 2008). The 1980s saw a surge in productivity growth in unionized firms as organizational change took place under pressure of competition (Machin and Wadhvani, 1989) and de-recognition of unions in the context of increases in foreign competition had a strong effect on productivity growth in the late 1980s (Gregg et al., 1993). The negative impact of multi-unionism on TFP growth, apparent from the 1950s through the 1970s, evaporated after 1979 (Bean and Crafts, 1996).

The UK has been more successful than most European countries in exploiting the opportunities of ICT and this has made a notable contribution to a relatively strong productivity performance in recent years (cf. Table 8). The 1980s' de-regulation of services that are intensive in the use of ICT (notably finance and retailing), which reduced barriers to entry, was important in this outcome as OECD cross-country comparisons reveal (Nicoletti and Scarpetta, 2005).<sup>4</sup> It is also clear that investment in ICT is much more profitable and has a bigger productivity payoff if it is accompanied by organizational change in working and management practices (Crespi et al., 2007). This would not have happened with 1970s-style industrial relations in conditions of weak competition. For example, Prais (1981, pp. 198-199) noted the egregious example of the newspaper industry where these conditions precluded the introduction of electronic equipment in Fleet Street although an investment of £50 million could have reduced costs by £35 million per year.

## **7. Conclusions**

Applied economists in the UK are now generally agreed that strengthening competition in product markets is good for productivity performance. This insight would be of no great surprise to the new economic historians of 40 years ago who examined the alleged failure of the late-Victorian economy but its implications have not been adequately explored in analyses of British economic growth during the twentieth century.

Understanding the effects of changes in competition in the British economy is much easier with the long-run perspective developed in this paper. This is partly because they work through interactions with institutions but also because hypotheses developed to interpret

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<sup>4</sup> The sensitivity of productivity performance in retailing to regulation is underlined by the sharp reduction in TFP growth in this sector in the UK after the introduction of stricter limits on out-of-town supermarkets in 1996 (Haskel and Sadun, 2009).

productivity performance in one period can be given an out-of-sample robustness check by looking at before and after. Thus, the experience of the golden age can be used to support the new economic historians' insistence on the importance of competition as a safeguard against failure in late Victorian Britain. Likewise, an argument that weak competition was a fundamental problem in the 1950s and 1960s is made more powerful since it can be shown that when competition was strengthened in later decades there was a strong productivity response.

Competition in the British economy was undermined in the 1930s and remained weak until the 1970s. This was a period of relative economic decline which culminated in the overtaking of Britain by many other European countries. The weakness of competition interacted with institutional legacies, namely, craft control on the shop floor and the separation of ownership and control in the boardroom, to underpin familiar aspects of diagnoses of the 'British disease' in terms of inadequate management and dysfunctional industrial relations. Productivity performance was clearly impaired when competition was reduced from the 1930s and improved from the 1980s as a consequence of the return to stronger competition.

Recognition of the central role of competition in shaping incentive structures which explain the waxing and waning of behaviours which play a major role in British relative economic performance allows a richer analysis (with clear policy implications) than is obtained by considering the various 'problem components' of the economy separately. The full implications of the retreat from competition during and after the 1930s are only apparent when the framework of bargaining between firms and their workers together with the weakness of shareholders relative to managers are taken into account.

Of course, competition, or the lack of it, is by no means the whole story with regard to British relative economic decline. For example, education, taxation, macroeconomic policy are all deserving of attention. Shortfalls in human and physical capital per hour worked, which reflect investment decisions made over the decades for many other reasons, played a major part. This paper does not claim to offer a full account of economic performance but simply to provide a useful perspective.

## References

- Abramovitz, M., David, P. A., 1996. Convergence and delayed catch-up: productivity leadership and the waning of American exceptionalism. In: Landau, R., Taylor, T. and Wright, G. (Eds.), *The Mosaic of Economic Growth*. Stanford, Stanford University Press, pp. 21-62.
- Abramovitz, M., David, P. A., 2001. Two centuries of American macroeconomic growth: from exploitation of resource abundance to knowledge-driven development. Stanford Institute for Economic Policy Research Discussion Paper No. 01-05.
- Aghion, P., Ashkenazy, P., Bourles, R., Cette, G. and Dromel, N., 2009. Education, market rigidities and growth. *Economics Letters*, 102, 62-65.
- Aghion, P., Bloom, N., Blundell, R., Griffith, R. and Howitt, P. 2005. Competition and innovation: an inverted U relationship. *Quarterly Journal of Economics*, 120, 701-728.
- Aghion, P., Blundell, R., Griffith, R., Howitt, P. and Prantl, S. 2009. The effects of entry on incumbent innovation and productivity. *Review of Economics and Statistics*, 91, 20-32.
- Aghion, P., Dewatripont, M. and Rey, P. (1997). Corporate governance, competition policy and industrial policy. *European Economic Review*, 41, 797-805.
- Aghion, P., Howitt, P., 2006. Appropriate growth theory: a unifying framework. *Journal of the European Economic Association*, 4, 269-314.
- Bamberg, J. H., 1988. The rationalisation of the British cotton industry in the interwar years. *Textile History*, 19, 83-102.
- Batchelor, R. A., Major, R. L., and Morgan, A. D., 1980. *Industrialisation and the Basis for Trade*. Cambridge, Cambridge University Press.
- Bean, C., Crafts, N., 1996. British economic growth since 1945: relative economic decline ... and renaissance? In: Crafts, N. and Toniolo, G. (Eds.), *Economic Growth in Europe since 1945*. Cambridge, Cambridge University Press, pp.131-172.
- Blanchflower, D., Oswald, A. and Sanley, P., 1996. Wages, profits, and rent-sharing. *Quarterly Journal of Economics*, 111, 227-252.
- Bloom, N., van Reenen, J., 2007. Measuring and explaining management practices across firms and countries. *Quarterly Journal of Economics*, 122, 1351-1408.

- Blundell, R., Griffith, R., and van Reenen, J., 1999. Market share, market value, and innovation in a panel of British manufacturing firms. *Review of Economic Studies*, 66, 529-554.
- Booth, A., 1987. Britain in the 1930s: a managed economy? *Economic History Review*, 40, 499-522.
- Bourles, R, Cette, G., 2007. Trends in 'structural' productivity levels in the major industrialized countries. *Economics Letters*, 95, 151-156.
- Broadberry, S. N., 1997a. Forging ahead, falling behind and catching-up: a sectoral analysis of Anglo-American productivity differences, 1870-1990. *Research in Economic History*, 17, 1-37.
- Broadberry, S. N., 1997b. Anglo-German productivity differences, 1870-1990: a sectoral analysis. *European Review of Economic History*, 1, 247-267.
- Broadberry, S. N., 1997c. *The Productivity Race*. Cambridge, Cambridge University Press.
- Broadberry, S. N., Crafts, N. F. R., 1992. Britain's productivity gap in the 1930s: some neglected factors. *Journal of Economic History*, 52, 531-558.
- Broadberry, S.N., Crafts, N.F.R., 1996. British economic policy and industrial performance in the early postwar period. *Business History*, 38(4), 65-91.
- Broadberry, S., Crafts, N., 2001. Competition and innovation in 1950s' Britain. *Business History*, 43, 97-118.
- Broadberry, S., Crafts, N., 2011. Openness, protectionism and Britain's productivity performance over the long run. In: Wood, G, Mills, T. C., and Crafts, N. (Eds.), *Monetary and Banking History*. London, Routledge, pp. 254-286.
- Brown, E. C., 1964. Industrial production in 1935 and 1948. *London & Cambridge Economic Bulletin*, December, v-vii.
- Brown, W., 2008. The influence of product markets on industrial relations. In: Blyton, P., Bacon, N., Fiorito, J, and Heery, E. (Eds.), *The SAGE Handbook of Industrial Relations*. SAGE publications, London, pp. 113-128.
- Brown, W., Bryson, A., and Forth, J., 2008. Competition and the retreat from collective bargaining. *National Institute of Economic and Social Research Discussion Paper No. 318*.
- Buccirossi, P., Clari, L., Duso, T., Spagnolo, G. and Vitale, C., 2009. Competition policy and economic growth: an empirical assessment. *CEPR Discussion Paper No. 7470*.

- Cain, L. P., Paterson, D. G., 1986. Biased technical change, scale and factor substitution in American industry, 1850-1919. *Journal of Economic History*, 46, 153-164.
- Cain, P., 1988. Railways, 1870-1914: the maturity of the private system. In: Freeman, M. and Aldcroft, D. H. (Eds.), *Transport in Victorian Britain*. Manchester, Manchester University Press, pp. 93-133.
- Chabot, B. R., Kurz, C. J., 2010. That's where the money was: foreign bias and English investment abroad, 1866-1907. *Economic Journal*, 120, 1056-1079.
- Cheffins, B. R., 2008. *Corporate ownership and control: British business transformed*. Oxford, Oxford University Press.
- Cincera, M., Galgau, O., 2005. Impact of market entry and exit on EU productivity and growth performance. European Commission DG for Economic and Financial Affairs Economic Papers No. 222.
- Clarke, R., 1985. *Industrial Economics*. Oxford, Blackwell.
- Clarke, R., 1993. Trends in concentration in UK manufacturing, 1980-9. In: Casson, M. and Creedy, J. (Eds.), *Industrial Concentration and Economic Inequality*. Cheltenham, Edward Elgar, pp. 121-142.
- Clarke, R., Davies, S., and Driffield, N., 1998. *Monopoly Policy in the UK: Assessing the Evidence*. Cheltenham, Edward Elgar.
- Conway, P., Nicoletti, G., 2006. Product market regulation in the non-manufacturing sectors of OECD countries: measurement and highlights. OECD Economics Department Working Paper No. 530
- Cosh, A. D., Guest, P., and Hughes, A., 2008. UK corporate governance and takeover performance. In: Gugler, K. and Yurtoglu, B. B. (Eds.), *The Economics of Corporate Governance and Mergers*. Cheltenham, Edward Elgar, pp. 226-261.
- Crafts, N., 1998. Forging ahead and falling behind: the rise and relative decline of the first industrial nation. *Journal of Economic Perspectives*, 12(2), 193-210.
- Crafts, N., 2004. Long-run growth. In: Floud, R. and Johnson, P. (Eds.), *The Cambridge Economic History of Modern Britain*, vol. 2. Cambridge, Cambridge University Press, pp. 1-24.
- Crafts, N., Leunig, T., and Mulatu, A., 2008. Were British railway companies well managed in the early twentieth century? *Economic History Review*, 61, 842-866.
- Crafts, N., Mills, T. C., 2005. TFP growth in British and German Manufacturing, 1950-1996. *Economic Journal*, 115, 649-670.

- Crafts, N., Mills, T. C., 2011. The price-cost mark-up in the UK: a long-run perspective. In: Wood, G., Mills, T. C., and Crafts, N. (Eds.), *Monetary and Banking History*. London, Routledge, pp. 287-300.
- Crafts, N., Toniolo, G., 2010. Aggregate growth, 1950-2005. In: Broadberry, S. and O'Rourke, K. H. (Eds.), *The Cambridge Economic History of Modern Europe*, vol. 2. Cambridge, Cambridge University Press, pp. 296-332.
- Crespi, G., Criscuolo, C., and Haskel, J., 2007. Information technology, organizational change and productivity growth: evidence from UK firms. London School of Economics Centre for Economic Performance Discussion Paper No. 783.
- Criscuolo, C., Haskel, J., and Martin, R., 2004. Import competition, productivity, and restructuring in UK manufacturing. *Oxford Review of Economic Policy*, 20, 393-408.
- Crouch, C., 1993. *Industrial Relations and European State Traditions*. Oxford, Clarendon Press.
- Davis, L. E., Huttenback, R. A., 1986. *Mammon and the Pursuit of Empire: the Political Economy of British Imperialism, 1860-1912*. Cambridge, Cambridge University Press.
- De Jong, H., Woltjer, P., 2009. A comparison of real output and productivity for British and American manufacturing in 1935. Groningen Growth and Development Centre Research Memorandum No. 108.
- Edgerton, D. E. H., Horrocks, S., 1994. British industrial research and development before 1945. *Economic History Review*, 47, 213-238.
- Ennew, C, Greenaway, D., and Reed, G., 1990. Further evidence on effective tariffs and effective protection in the UK", *Oxford Bulletin of Economics and Statistics*, 52, 69-78.
- Fellner, W., 1951. The influence of market structure on technological progress. *Quarterly Journal of Economics*, 65, 556-577.
- Geroski, P., 1990. Innovation, technological opportunity, and market structure. *Oxford Economic Papers*, 42, 586-602.
- Geroski, P., Jacquemin, A., 1988. The persistence of profits: a European comparison. *Economic Journal*, 98, 375-389.
- Goetzmann, W. N., Ukhov, A. D., 2006. British investment overseas 1870-1913: a modern portfolio theory approach. *Review of Finance*, 10, 261-200.
- Gospel, H., 2005. Markets, firms and unions. In: Metcalf, D. and Fernie, S., *Trade Unions: Resurgence or Demise?* London, Routledge, pp. 19-44.

- Greasley, D., Oxley, L., 1996. Discontinuities in competitiveness: the impact of the First World War on British industry. *Economic History Review*, 49, 82-100.
- Greenaway, D., Milner, C., 1994. Determinants of the inter-industry structure of protection in the UK. *Oxford Bulletin of Economics and Statistics*, 53, 265-279.
- Gregg, P., Machin, S., and Metcalf, D., 1993. Signals and cycles: productivity growth and changes in union status in British companies, 1984-9. *Economic Journal*, 103, 894-907.
- Griffith, R., 2001. Product market competition, efficiency and agency costs: an empirical analysis. Institute for Fiscal Studies Working Paper No. 01/12.
- Griffith, R., Harrison, R. and Simpson, H., 2006. The link between product market reform, innovation and EU macroeconomic performance. *European Economy Economic Papers* No. 243.
- Hannah, L., 1983. *The Rise of the Corporate Economy*. London, Methuen.
- Hannah, L., 2007. The 'divorce' of ownership and control from 1900 onwards: re-calibrating imagined global trends. *Business History*, 49, 404-438.
- Harris, R., Siegel, D. S., and Wright, M., 2005. Assessing the impact of management buyouts on economic efficiency: plant-level evidence from the United Kingdom. *Review of Economics and Statistics*, 87, 148-153.
- Hart, P. E., 1968. A long-run analysis of the rate of return on capital in manufacturing industry, United Kingdom, 1920-62. In: Hart, P. E. (Ed.), *Studies in Profit, Business Saving and Investment in the United Kingdom, 1920-1962*. London, George Allen & Unwin, pp. 220-283.
- Haskel, J., 1991. Imperfect competition, work practices and productivity growth. *Oxford Bulletin of Economics and Statistics*, 53, 265-279.
- Haskel, J., Sadun, R., 2009. Regulation and UK retailing productivity: evidence from micro-data. CEPR Discussion Paper No. 7140.
- Henley, A., 1988. Price formation and market structure: the case of the interwar coal industry. *Oxford Bulletin of Economics and Statistics*, 50, 263-278.
- Hill, T. P., 1979. *Profits and Rates of Return*. Paris, OECD.
- Hitiris, T., 1978. Effective protection and economic performance in UK manufacturing industry, 1963 and 1968. *Economic Journal*, 88, 107-120.
- Hoj, J., Jimenez, M, Maher, M., Nicoletti, G, and Wise, M., 2007. Product market competition in OECD countries: taking stock and moving forward. OECD Economics Department Working paper No. 575.

- Hutchinson, H., 1965. *Tariff-Making and Industrial Reconstruction*. London, Harrap.
- Irving, R. J., 1976. *The North-Eastern Railway Company*. Leicester, Leicester University Press.
- Irwin, D. A., 2001. Tariffs and growth in late nineteenth-century America. *The World Economy*, 24, 15-30.
- Jacks, D. S., 2006. New results on the tariff-growth paradox. *European Review of Economic History*, 10, 205-230.
- Jacks, D. S., Meissner, C. M. and Novy, D., 2009. Trade booms, trade busts, and trade costs. NBER Working Paper No. 15267.
- Kitson, M., Solomou, S., 1990. *Protectionism and Economic Revival*. Cambridge, Cambridge University Press.
- Kitson, M., Solomou, S., Weale, M., 1991. Effective protection and economic recovery in the United Kingdom during the 1930s. *Economic History Review*, 44, 328-338.
- Koke, J. and Renneboog, L., 2005. Do corporate control and product-market competition lead to stronger productivity growth?: evidence from market-oriented and blockholder-based governance regimes. *Journal of Law and Economics*, 48, 475-516.
- Landes, D. S., 1969. *The Unbound Prometheus*. Cambridge, Cambridge University Press.
- Lehmann, S. H., O'Rourke, K. H., 2008. The structure of protection and growth in the late 19<sup>th</sup> century. NBER Working Paper No. 14493.
- Leunig, T., 2001. New answers to old questions: explaining the slow adoption of ring spinning in Lancashire, 1880-1913. *Journal of Economic History*, 61, 439-466.
- Leunig, T., 2003. A British industrial success: productivity in the Lancashire and New England cotton spinning industries a century ago. *Economic History Review*, 56, 90-117.
- Macallan, C., Millard, S. and Parker, M., 2008. The cyclicalities of mark-ups and profit margins for the United Kingdom: some new evidence. Bank of England Working Paper No. 351.
- Machin, S., Wadhvani, S., 1989. The effects of unions on organisational change, investment and employment: evidence from WIRS data. London School of Economics Centre for Labour Economics Discussion Paper No. 355.
- Maddison, A., 1996. Macroeconomic accounts for European countries. In: van Ark, B. and Crafts, N. (Eds.), *Quantitative Aspects of Postwar European Economic Growth*. Cambridge, Cambridge University Press, pp. 27-83.



- Magee, G., 2004. Manufacturing and technological change. In: Floud, R. and Johnson, P. (Eds.), *The Cambridge Economic History of Modern Britain*, vol. 2. Cambridge, Cambridge University Press, pp. 74-98.
- Martin, S., 1993. Endogenous firm efficiency in a Cournot principal-agent model. *Journal of Economic Theory*, 59, 445-450.
- Matthews, R. C. O., Feinstein, C. H. and Odling-Smee, J. C., 1982. *British Economic Growth, 1856-1973*. Stanford, Stanford University Press.
- McCloskey, D. N., 1970. Did Victorian Britain fail? *Economic History Review*, 23, 446-459.
- McCloskey, D. N., Sandberg, L., 1971. From damnation to redemption: judgments on the late Victorian entrepreneur. *Explorations in Economic History*, 9, 89-108.
- Mercer, H., 1989. The evolution of British government policy towards competition in private industry, 1940-1956. Unpublished Ph. D. thesis, London School of Economics.
- Metcalf, D., 2002. Unions and productivity, financial performance and investment: international evidence. London School of Economics Centre for Economic Performance Discussion Paper No. 539.
- Michie, R., 1988. The finance of innovation in late-Victorian and Edwardian Britain: possibilities and constraints. *Journal of European Economic History*, 17, 491-530.
- Mills, T. C., 1991. Are output fluctuations in the UK transitory or permanent? *Manchester School*, 59, 1-11.
- Morgan, A. D., Martin, D., 1975. Tariff reductions and UK imports of manufactures, 1955-1971. *National Institute Economic Review*, 72, 38-54.
- Nickell, S. J., 1996. Competition and corporate performance. *Journal of Political Economy*, 104, 724-746.
- Nickell, S.J., Nicolitsas, D., and Dryden, N., 1997. What makes firms perform well? *European Economic Review*, 41, 783-796.
- Nicoletti, G., Scarpetta, S., 2003. Regulation, productivity and growth. *Economic Policy*, 36, 9-72.
- Nicoletti, G., Scarpetta, S., 2005. Regulation and economic performance: product market reforms and productivity in the OECD. OECD Economics Department Working Paper No. 460.
- O'Mahony, M., 1999. *Britain's Productivity Performance, 1950-1996*. London, NIESR.

- O'Mahony, M., van Ark, B., 2003. EU Productivity and Competitiveness: an Industry Perspective. Luxembourg, Office for Official Publications of the EC.
- O'Mahony, M., Timmer, M., 2009. Output, input and productivity measures at the industry level: the EU KLEMS database. *Economic Journal*, 119, F374-F403.
- Political and Economic Planning, 1962. Atlantic Tariffs and Trade. London, George Allen & Unwin.
- Pollard, S. J., 1983. The Development of the British Economy, 1914-1980. London, Edward Arnold.
- Prais, S. J., 1981. Productivity and Industrial Structure. Cambridge, Cambridge University Press.
- Pratten, C. F., Atkinson, A. G., 1976. The use of manpower in British industry. *Department of Employment Gazette*, 84, 571-576.
- Proudman, J., Redding, S., 1998. A summary of the openness and growth project. In: Proudman, J. and Redding, S. (Eds.), *Openness and Growth*. London, Bank of England, pp. 1-29.
- Richardson, H. W., 1965. Over-commitment in Britain before 1930. *Oxford Economic Papers*, 17, 237-262.
- Scharfstein, D., 1988. Product-market competition and managerial slack. *Rand Journal of Economics*, 19, 147-155.
- Sebag-Montefiore, M. J., 1943. Trade Regulations and Commercial Policy of the United Kingdom. Cambridge, Cambridge University Press.
- Stewart, M. B., 1990. Union wage differentials, product market influences and the division of rents. *Economic Journal*, 100, 1122-1137.
- Supple, B. E., 1987. *History of the British Coal Industry*, vol. 4, 1913-1946. Oxford, Oxford University Press.
- Symeonidis, G., 2008. The effects of competition on wages and productivity: evidence from the United Kingdom. *Review of Economics and Statistics*, 90, 134-146.
- Temin, P., 2002. The golden age of European growth reconsidered. *European Review of Economic History*, 6, 3-22.
- Thomas, M. F., 1984. An input-output approach to the British economy, 1890-1914. Unpublished D. Phil. Thesis, University of Oxford.

- Timmer, M., Inklaar, R., O'Mahony, M. and van Ark, B., 2010. *Economic Growth in Europe*. Cambridge, Cambridge University Press.
- Tolliday, S., 1987. *Business, Banking and Politics: the Case of British Steel, 1918-1939*. Cambridge, Cambridge University Press.
- Tomlinson, J., 1996. Inventing 'decline': the falling behind of the British economy in the postwar years. *Economic History Review*, 49, 731-757.
- Van Reenen, J., 1996. The creation and capture of rents: wages and innovation in a panel of UK companies. *Quarterly Journal of Economics*, 111, 195-226.
- Wolfl, A., Wanner, I., Kozluk, T., and Nicoletti, G., 2009. Ten years of product market reform in OECD countries: insights from a revised PMR indicator. OECD Economic Department Working paper No. 695.
- Wren, C., 1996. *Industrial Subsidies: the UK Experience*. London, Macmillan.

**Table 1. Real GDP/head as percentage of other countries in each year**

	<b><i>UK/USA</i></b>	<b><i>UK/West Germany</i></b>	<b><i>UK/France</i></b>
1870	130.5	173.5	170.0
1913	92.8	134.9	141.2
1929	79.8	135.8	116.8
1937	96.7	132.7	138.6
1950	72.6	162.1	133.8
1979	70.1	86.3	90.0
2007	75.4	101.4	106.1

*Note:* estimates refer to Germany from 1870 to 1937.

*Sources:* Angus Maddison historical database and West Germany in 2007 calculated from Statistisches Bundesamt Deutschland 2010.

**Table 2. Comparative USA/UK and Germany/UK total factor productivity levels by sector, 1871-1999 (UK = 100)**

	<i>Agriculture</i>	<i>Industry</i>	<i>Services</i>	<i>Whole Economy</i>
<b>USA/UK</b>				
1869/71	99.5	154.2	86.5	95.2
1889/91	123.0	139.6	64.3	83.3
1909/11	118.7	150.9	71.6	90.5
1919/20	133.1	158.3	92.1	108.2
1929	118.0	187.8	92.0	112.7
1937	119.2	161.2	89.1	105.9
1950	132.6	217.6	110.2	138.1
<b>Germany/UK</b>				
1871	58.4	90.5	67.2	61.6
1891	59.8	91.6	65.5	63.2
1911	71.6	106.1	76.4	75.4
1925	57.0	92.9	83.6	74.3
1929	59.3	96.0	90.0	78.5
1935	59.6	97.1	88.8	78.2
1950	44.7	89.4	89.3	76.2

*Note:* West Germany in 1950

*Sources:* Broadberry (1997a, 1997b)

**Table 3. Whole Economy TFP Growth, 1890-1973 (% per year)**

	<i>Germany</i>	<i>UK</i>	<i>USA</i>
1891-1929	0.9	0.3	1.0
1929-50	N/A	0.6	1.5
1950-73	2.7	1.3	1.5

*Note:* West Germany in 1950-73. Labour inputs are measured in persons, education subsumed in TFP.

*Sources:* worksheets underlying sources for Table 2.

**Table 4. Real output/hour worked in manufacturing.**

	<i>UK growth (% per year)</i>	<i>US growth (% per year)</i>		<i>US/UK (UK = 100)</i>
			1870	195.2
1870-90	1.58	1.75	1890	201.9
1890-1913	1.33	2.11	1913	241.2
1913-29	2.46	3.05	1929	264.5
1929-37	2.90	3.35	1937	274.0

*Source:* de Jong and Woltjer (2009); data kindly supplied by Herman de Jong.

**Table 5. Levels and rates of growth of real GDP/head, 1950-73.**

	<i>Y/P, 1950 (\$1990GK)</i>	<i>Y/P, 1973 (\$1990GK)</i>	<i>Growth of Y/P, 1950-73 (% per year)</i>
Switzerland	9064	18204	3.08
Denmark	6943	13945	3.08
UK	6939	12025	2.42
Sweden	6739	13494	3.06
Netherlands	5971	13081	3.45
Belgium	5462	12170	3.54
Norway	5430	11324	3.24
France	5186	12824	4.02
West Germany	4281	13153	5.02
Finland	4253	11085	4.25
Austria	3706	11235	4.94
Italy	3502	10634	4.95
Ireland	3453	6867	3.03
Spain	2189	7661	5.60
Portugal	2086	7063	5.45
Greece	1915	7655	6.21

*Source:* The Conference Board (2010)



**Table 6. Levels of productivity in the market sector (UK = 100)**

	<i>France</i>	<i>West Germany /Germany</i>	<i>USA</i>
<b>Y/HW</b>			
1973	95	132	160
1979	112	157	166
1991	123	161/143	156
1995	117	133	146
2007	109	119	147
<b>TFP</b>			
1973	87	112	127
1979	103	135	135
1991	110	133/123	128
1995	104	115	123
2007	101	110	125

*Notes:*

Estimates in 1973 and 1979 are West Germany; in 1991 West Germany is the first number, in 1995 and 2007 estimates are for unified Germany.

*Sources:* estimates kindly provided by Mary O'Mahony based on EUKLEMS data as described in O'Mahony and Timmer (2009) and on earlier data underlying O'Mahony (1999) and O'Mahony and van Ark (2003).

**Table 7. Indicators of protectionism.**a) Average tariff rates on UK manufactures (%)

1932	13.2
1935	14.7
1960	14.5
1963	12.8
1968	11.2

b) Tariff rates for UK and West German manufacturing (%)

	<i>UK</i>	<i>West Germany</i>
Chemicals	15	8
Leather	16	12
Rubber	21	10
Wood	15	7
Paper	13	8
Textiles	23	11
Non-Metallic Minerals	17	6
Iron & Steel	14	7
Non-Electrical Machinery	17	5
Electrical Machinery	23	6
Transport Equipment	25	12
Clothing	26	13
Instruments	27	8

c) Trade Costs Index

	<i>UK-France</i>	<i>UK-Germany</i>	<i>France-Germany</i>	<i>Germany-Italy</i>
1929	100	99	99	110
1938	121	122	133	112
1950	122	142	112	127
1960	122	115	91	101
1970	110	105	73	79
1980	74	66	55	61
1990	70	61	53	56
2000	75	66	61	66

*Note:* trade costs include all barriers to trade (policy and non-policy) and are derived from estimation of a gravity equation.

*Sources:*

Part a): Kitson and Solomou (1990); Morgan and Martin (1975); Part b): Political and Economic Planning (1962); Part c): data underlying Jacks et al. (2009) kindly provided by Dennis Novy.

**Table 8. Sources of labour productivity growth in the market sector, 1995-2005 (% per year)**

	<i>Labour Quality</i>	<i>ICTK/HW</i>	<i>Non-ICT K/HW</i>	<i>TFP</i>	<i>Labour Productivity Growth</i>
France	0.4	0.4	0.4	0.9	2.1
Germany	0.1	0.5	0.6	0.4	1.6
UK	0.5	0.9	0.4	0.8	2.6
USA	0.3	1.0	0.3	1.3	2.9

Source: Timmer et al. (2010)

**Table 9. Product market regulation, competition policy, and price-cost margins**

a) PMR

	<b>1975</b>	<b>1990</b>	<b>1998<sup>a</sup></b>	<b>1998<sup>b</sup></b>	<b>2003</b>	<b>2008</b>
France	6.0	5.2	4.3	2.52	1.75	1.45
Germany	5.2	4.6	2.8	2.06	1.60	1.33
UK	4.8	3.0	1.4	1.07	0.82	0.84
USA	3.7	2.3	1.6	1.28	1.01	0.84

b) CPI

	<b>1995</b>	<b>2005</b>
France	0.45	0.52
Germany	0.49	0.52
UK	0.30	0.60
USA	0.59	0.62

c) Price-Cost Margin, late 1990s

	<b>Manfs.</b>	<b>Services</b>
France	1.12	1.26
Germany	1.13	1.25
UK	1.11	1.16
USA	1.12	1.19

*Sources:*

PMR is a measure of how far regulation impedes product market competition on a scale of 0-6 from Conway and Nicoletti (2006) and Wolfl et al. (2009); the first three and the last three columns are measured on a different basis.

CPI is an index of competition policy taking into account independence of the competition authorities, deterrence and enforcement from Buccirosi et al. (2009).

Price-cost margin from Hoj et al. (2007).