

Original citation:

Crafts, Nicholas (2012) Creating competitive advantage : policy lessons from history. Working Paper. Coventry, UK: Department of Economics, University of Warwick. (CAGE Online Working Paper Series).

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June 2012

No.91

**Creating Competitive Advantage: Policy Lessons from
History**

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WORKING PAPER SERIES

Centre for Competitive Advantage in the Global Economy

Department of Economics

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Abstract

This paper reviews selected aspects of the history of UK supply-side policy in terms of their productivity implications. An important change after the 1970s which improved productivity performance was the adoption of policies to end protectionism and strengthen competition. A review of horizontal industrial policies shows weaknesses in education, infrastructure, taxation and, especially, land-use planning but, on the positive side, a regulatory stance conducive to the rapid adoption of ICT. A big implication is that any return to a more active industrial policy should be designed to minimize adverse effects on competition.

Keywords: competition; industrial policy; productivity; supply-side policy

JEL Classifications: N14; O25: O52

1. Introduction

In the 1990s, 'national competitiveness' was defined as 'the degree to which the country...can produce goods and services which meet the test of international markets, while simultaneously maintaining and expanding incomes of its people over the long term' (DTI, 1994). This definition still has value and Lord Heseltine, then president of the Board of Trade is now in 2012 conducting a competitiveness audit.

This version of the 'national competitiveness' concept is useful in several ways. It recognizes that international trade is a positive-sum game, that as an open economy the UK can share in the gains from trade but that the growth of real national income depends in part on the terms of trade, and that underlying both the growth of real GDP per person and successful participation in international markets is labour productivity growth. In turn, labour productivity growth comes from the growth of (broad) capital per hour worked and total factor productivity (TFP) growth, i.e., improvements in the efficiency and technology with which capital and labour are used.

So economic growth, and especially productivity growth, is at the heart of the matter. In turn, long-run productivity performance depends upon decisions to invest, innovate, and adopt new technology which in a market economy will be sensitive to incentive structures. This means that a wide range of government actions which comprise 'supply-side policy' can potentially have an impact on productivity growth.

Over the period since the 1930s there has been considerable variation in the design of UK policies intended to improve growth outcomes. Combating British relative economic decline was a major issue from 1960 onwards; in this regard, Table 1 suggests that outcomes were more favourable post-1979. Informed by key ideas from economics, this brief review seeks to draw out some of the main lessons from the historical experience and to highlight some policy implications of past successes and failures.

2. Key Ideas

a) Growth in an Open Economy

Despite attaining laughing-stock status in Punch-and-Judy politics, 'post-neoclassical endogenous growth theory' offers important insights into the way supply-side policy can be designed to promote productivity growth. The main thrust is that growth depends on investment in tangible and intangible capital, in education and training, and on innovation. Decisions to invest and innovate respond to economic incentives such that well-designed policy which addresses market failures can raise the growth rate a bit. This implies governments need to pay attention to making investments that complement private sector capital accumulation, for example in infrastructure, to supporting activities like R and D where social returns exceed private returns, to avoiding the imposition of high marginal direct tax rates and to fostering competitive pressure on management to develop and adopt cost-effective innovations.

In the long-run, the key to sustained growth in labour productivity (and growth in living standards) is technological progress. In this context, however, it is important to recognize that better technology can be the result of domestic invention or technology transfer from abroad which is implemented by means of appropriate investments in physical and organizational capital. In fact, most new technology comes from abroad and TFP growth depends much more on foreign than domestic R & D; Eaton and Kortum (1999) estimated that even in big advanced countries like France, Germany and the UK the domestic R & D contribution was in the range 11 to 16 per cent compared with a foreign contribution of 84 to 89 per cent, of which close to half came from the United States. That said, domestic R and D has high social returns and an important part of its payoff is in enabling effective technology transfer (Griffith et al., 2004).

Nevertheless, the contribution of new technology to growth comes from its use. The key to good growth performance is prompt and effective diffusion of foreign technology rather than domestic invention. A key example in recent times has been ICT which has raised growth potential in countries with no ICT production by providing a new type of capital equipment whose price has been falling very rapidly implying that profit-maximizing decisions would raise the ratio of ICT equipment relative to other types of capital.¹ Table 2 reports estimates of the long-run growth contribution of ICT. Two points stand out. First, the ICT-use effect dominates the ICT-output effect. Second, if all countries were as effective as Sweden in diffusing these technologies, the growth contribution would be significantly higher in most cases.

Growth accounting is a way of further quantifying these arguments. Some recent estimates based on a methodology which explicitly identifies a contribution from intangible capital are reported in Table 3. The important points to note are first, TFP growth is the largest contributor to labour productivity growth but domestic R & D contributes relatively little, second, investment in tangible capital remains important as a source of labour productivity growth, and third, investment in intangibles other than R & D is far more important than R & D per se.

Table 4 examines sectoral contributions to recent labour productivity growth; the top sector is distribution. There are two points to take from this. First, a sector's contribution depends not only on its productivity growth rate but its weight in the economy. Second, distribution is a sector which does (virtually) no R & D but is big and has benefited greatly from the opportunity to improve productivity using ICT. In sum, policymakers should be aware of the basic arithmetic of growth and realize that diffusion matters much more than invention and that productivity improvement in big service sectors is central.

Economic growth is an unbalanced process – over time, some sectors expand and others contract. This reflects relative productivity growth, differences in income elasticities of demand, and, in an open economy, comparative advantage which reflects relative production costs between the UK and the rest of the world based on differences in productivity and payments to factors of production. Comparative advantage evolves reflecting developments both in the UK and our trading partners in

¹ Oulton (2010) shows that steady-state growth in a country with no ICT production predicted by a neoclassical model adapted to include both ICT and non-ICT capital in the production function will be augmented by $(\beta\Delta p/p)/s_L$ where β is the share of ICT capital in national income, $\Delta p/p$ is the rate of decline of the price of ICT equipment relative to other capital goods and s_L is the share of labour in national income.

terms of relative wage rates, technological capabilities, labour force skills, agglomeration benefits and this implies the need for sectoral and spatial adjustment as workers are redeployed, especially away from activities which have become importables in the face of competition from emerging Asia. A key requirement fully to realize the benefits from increased trade in a globalizing world is flexibility of labour and product markets. The general trajectory of adjustment for the UK has been and can be expected to be towards human-capital intensive activities including internationally-tradable services.

Increased openness to trade raises income levels and does so by more than the traditional welfare-triangles measure. Trade raises producer efficiency and thus TFP levels. The estimates of Frankel and Romer (1999) refined by Feyrer (2009) suggest that across countries if the sum of imports and exports relative to GDP goes up by 1 percentage point on average income per person rises by 0.5 per cent. Specialization in international trade does mean that the proportions of different sectors will vary across countries. It is potentially disadvantageous for overall productivity performance if comparative advantage promotes a high weight in low productivity growth activities. However, it would be wrong to make too much of this point since shift-share analyses always show that intra-sectoral productivity growth totally dominates composition effects.

Although higher productivity may seem attractive, the politics of achieving it may be quite challenging. A central aspect of technological progress is 'creative destruction', i.e., the exit of the old replaced by entry of the new. The pursuit of higher productivity through policies such as trade liberalization creates losers as well as gainers; realizing the potential productivity gains from privatization involves job losses. The common theme here is that, while there are gains for the economy as a whole, these do not translate into votes whereas the losses of the downsized producer groups are highly visible, matter a lot to the individuals involved, and have adverse implications for vote-seeking politicians.

b) Industrial Policy

'Industrial policy' is perhaps best defined in the manner of Caves (1987) to encompass public sector intervention aimed at changing the distribution of resources across economic sectors and activities. Thus, it includes both 'horizontal' policies which focus on activities such as innovation, provision of infrastructure and so on, while 'selective' policies aim to increase the size of particular sectors. The classic justification for industrial policy is that it remedies market failures, for example, by providing public goods, solving coordination problems, or subsidizing activities with positive externalities.

More generally, the development of endogenous-growth theory suggests that horizontal policies which raise the appropriable rate of return to innovation and/or investment can have positive effects on the rate of growth. Quite a wide range of government policies might be relevant here including the structure of taxation, extent and type of regulation, quality of state education and supply of infrastructure capital which raises private sector profitability.² For example, there is good reason to believe that the social rate considerably exceeds the private rate of return to R & D (Jones and Williams, 1998) and reliance on the market alone will mean too little R & D. Of course, since

² It is important to remember that the supply of public capital has to be financed and that the taxes that are levied to this end tend to have offsetting effects on private rates of return. For a discussion of the growth-maximizing ratio of public to private capital, see Kamps (2005a).

research intensity varies across industries, horizontal policies to encourage R & D help some sectors more than others. Similarly, there is evidence that investment in transport infrastructure has positive impacts on private sector investment and TFP (Kamps, 2005b; Egert et al., 2009) but these effects are greater in sectors that use transport intensively (Fernald, 1999).

The case for selective industrial policies has always been more controversial. However, the modern literature highlights three arguments in their favour, namely: infant-industry related capital market failures, agglomeration externalities, and rent-switching under imperfect competition. At the same time, a number of pitfalls in the use of such policies have been noted.

'Infant industry' arguments are not new but they have been reworked in recent times, notably by Bardhan (1971) and Young (1991). The case is for temporary protection of industries which are not currently internationally competitive but will be when productivity has improved through increasing returns and, in particular, learning by doing. The case for intervention really depends on the capital market's inability to finance these activities even though they will become privately profitable, perhaps because the learning effects accrue to the industry as a whole rather than being firm-specific. A key issue is whether the government can credibly commit to the policy intervention being temporary.

The advent of the new economic geography has increased awareness of the potential importance of agglomeration benefits which accrue when economic activity is characterized by scale economies together with market size effects. As city size increases, productivity gains can be realized through knowledge spillovers, better availability of intermediate inputs and the advantages of a thicker labour pool. Policy interventions may then be justified on the grounds of spatial externalities which are now recognized by the Department for Transport (2006) as an example of the 'wider economic benefits' that can result from transport projects. In cases where size matters, there may be gains from policy interventions that facilitate the expansion of an agglomeration or, indeed, the establishment of a successful cluster which obtains first-mover advantages.

The rent-switching argument came to prominence in the 1980s through the work of Brander and Spencer (1985). The argument here is that in cases of strategic rivalry in international trade the state can influence entry and exit decisions by offering subsidies that result in higher market share for its firm at the expense of a foreign rival and redistribute super-normal profits accordingly. Because government values objectives other than private profits it may be able credibly to commit to finance entry where capital markets cannot. Whether such interventions will succeed may be hard to predict, however, and where their size and/or timing turn out to be inappropriate they may be expensive failures.

It should also be acknowledged that there are important potential downsides to the use of selective industrial policy. In particular, it has been widely remarked that, in practice, support is disproportionately given to sunset rather than sunrise industries and some economists argue that this 'government failure' is an inherent aspect of the political economy of industrial policy. Recently, Baldwin and Robert-Nicoud (2007) have used a variant of the well-known 'protection-for-sale' model to argue that the asymmetric appropriability of rents implies losers lobby harder while earlier explanations include the 'social insurance' explanation of Hillman (1989) and the suggestion by Krueger (1990) that known losers in ailing industries are more visible than unknown gainers in

expanding industries. It should also be recognized that insofar as selective industrial policy works through protection of domestic producers some of the potential gains from trade are given up.

An important issue is whether industrial policy reduces competition. Although theory is ambiguous about the impact of competition on productivity performance, the evidence for the UK is very strongly that there is a positive effect. This has worked in several ways including encouraging innovation to protect rents (Aghion et al., 2009), reducing agency problems within firms (Nickell, 1996), improving management practices (Bloom and van Reenen, 2007) and reducing the power of unions to resist organizational change (Machin and Wadhvani, 1989). Ideally, industrial policy should be used in a competition-friendly way and not through aiming to create 'national champions' (Aghion et al., 2011).

3. A Short History of British Supply-Side Policy

a) The 1930s

The interwar economy saw a major shift in supply-side policy away from Victorian orthodoxy. Prompted initially by high unemployment and the travails of the old staple industries and given considerable impetus by the world economic crisis, governments became more willing to intervene. This period saw the beginnings of industrial policy in the 1920s, the general tariff on manufacturing in 1932, encouragement of cartels and imposition of controls on foreign investment in the 1930s. These changes were complemented by exit from the gold standard in 1931 followed by the era of cheap money so that Britain in the 1930s has been described as a 'managed economy' (Booth, 1987). The hallmark was a central objective of a steady increase in the price level - which on the assumption that money wages would not react also amounted to reducing real wages and restoring profits – subject to not letting inflation spiral out of control. The rise in the price level would be promoted through cheap money, a weak pound, tariffs, and encouraging firms to exploit their (enhanced) market power. This was entirely understandable as a short-term fix. However, this was a major retreat from competition which turned out to be quite long-lasting. What were the implications for productivity performance?

The growth performance of the British economy in the 1930s has sometimes been viewed quite favourably, especially by writers sympathetic to the view that Britain failed in the pre-1914 period (Pollard, 1983). It is, however, difficult to accept the claim that there was a marked improvement in growth performance in the 1930s. 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 the late 19th century while TFP growth remained well below the standard set by the United States during the first half of the twentieth century. Time series econometric analyses do not indicate a break in 1929 either in GDP or industrial production growth (Mills, 1991; Greasley and Oxley, 1996). Notwithstanding the much greater severity of the depression in the United States, output per hour worked continued to grow faster in American manufacturing with the result that the level of American labour productivity was 2.74 times that of the UK in 1937 compared with 2.41 in 1913 and 2.64 in 1929.

As might be expected, the interwar economy exhibits symptoms of a considerable increase in market power. Mercer (1995) showed that by 1935 at least 29 per cent of manufacturing output was cartelized. A proxy for the price-cost margin 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 cartelized sectors the increase was 9.0 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.

There is no evidence that the retreat from competition in the 1930s was good for productivity performance; if anything, the opposite is the case. 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) was ineffective in promoting productivity improvement through rationalization although this was supposedly a key policy objective. Tariffs were definitely not an 'infant-industry' policy; in fact, the largest increases in effective protection went to 'old' industries such as hosiery and lace and railway rolling stock (Kitson et al., 1991). A difference-in-differences analysis based on timing and extent of protection of manufactures finds no evidence that tariffs improved productivity performance (Crafts, 2012).

Finally, it is clear that macroeconomic crises can have long-lasting effects on trend growth (rather than simply levels effects on GDP) through the policy responses which they generate at the time and then become entrenched. For the UK, the 1930s bred protectionism and an economy in which the typical business enjoyed considerable market power. There is clear evidence that this was bad for productivity performance but the politics of reversing these developments was difficult. The risks of a supposedly 'temporary' abandonment of competition policy, and the likelihood that the long-term downside of so doing would heavily outweigh any short term gain, are apparent. Although during the war some officials at the Board of Trade had planned a tough anti-trust policy, lobbying by industry and the exigencies of the post-war export drive meant these plans were abandoned. The only significant measure was the 1956 Restrictive Practices Act but even this was an accident where the interpretation of the law by the courts turned out to be very strict, contrary to the expectations of business. Mercer (1995) documents the strong commitment of industrialists to the retention of their anti-competitive practices and their success in using the political process to obstruct reforms that would have introduced effective competition policies in early post-war Britain.

c) The 1950s through the 1970s

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. During the so-called 'golden age' which ended in 1973, 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. The proximate reasons for this were weak capital per worker and TFP growth compared with more successful economies like West Germany. Maddison (1996) attempted a decomposition of the sources of TFP growth which concluded that the shortfall 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). Being overtaken by France and West Germany (Table1) is a clear sign of avoidable failure.

In the early post-war years, supply-side policy continued along the trajectory established in the 1930s. The striking feature is how long it took to reverse this; not until the 1980s were most of these issues addressed. Table 5 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 considerably higher than in West Germany in the late 1950s. Trade costs remained above the 1929 level until the 1970s when 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. However, early post-war governments were interventionist and this was the heyday of selective industrial policy (Table 6). It was also a period when there was increasing disappointment at relative economic decline and policymakers tried hard to increase the rate of economic growth during the 1960s and 1970s. Generally speaking, the literature has been highly critical of both horizontal and selective industrial policy in this period which saw substantial spending on them, peaking at 5.4% of GDP in 1970 (Wren 1996a).

With regard to horizontal policies, several points deserve to be noted. First, this period was characterized by a big emphasis on investment subsidies, amounting to about 10% of fixed investment at their peak in 1978 (Driver and Temple, 1999). These are widely thought to have been a badly-designed policy which was poorly targeted and represented very poor value for money. The econometric evidence is that they had little effect on the volume of investment over the long run (Sumner, 1999) with the implication that there was a large deadweight cost. Second, the UK spent heavily on R & D; at 2.3 per cent of GDP in 1964 this was second only to the United States and a high fraction was government financed. Here there was a market-failure justification in principle but unfortunately, this seems to have been badly directed and to have had little impact on productivity performance (Verspagen, 1996). Ergas (1987) summed up British policy as much too concerned with trying to produce radical innovations and too little aimed at effective technology transfer. Third, Table 6 reports large amounts spent on employment subsidies in the late 1960s and early 1970s. The schemes involved were the Selective Employment Premium and Regional Employment Premium. Both were costly errors. The former was designed to favour employment in manufacturing at the expense of services on the mistaken belief in Verdoorn's Law.³ The latter was an attempt to deal with the difficulties of regions which could not devalue with the UK currency union. It was a very costly way of 'creating jobs' with big deadweight losses (Wren, 1996b). Finally, the tax system was characterized by very high marginal direct tax rates such that Tanzi (1969) described it as the least conducive to growth of any of the countries in his study.

³ Verdoorn's Law was a favourite idea of Nicholas Kaldor. It claims that in manufacturing the rate of growth of labour productivity is positively related to the rate of growth of employment (dynamic economies of scale). This hypothesis was rejected by the evidence in Chatterji and Wickens (1982) who showed that there was a short-run cyclical relationship of this kind (Okun's Law) but no long-run one.

Turning to selective industrial policy, there is also little to celebrate. Although 'picking winners' may have been the aspiration, "it was losers like Rolls Royce, British Leyland and Alfred Herbert who picked Ministers" (Morris and Stout, 1985, p. 873). There was a very clear tendency for selective subsidies to be skewed towards relatively few industries, notably aircraft, shipbuilding and, latterly, motor vehicles (Wren, 1996a). The high expenditure on shipbuilding is striking since this was clearly an industry in which the UK no longer had a comparative advantage in the face of Asian competition. More generally, there is quite a strong bias towards shoring up ailing industries which is well reflected in the portfolio of holdings of the National Enterprise Board (Wren, 1996b), in the pattern of tariff protection across sectors (Greenaway and Milner, 1994), and also in the nationalizations of the 1970s where the prevalence of very poor rates of return reflected a lack of political will to eliminate productive inefficiency (Vickers and Yarrow, 1988).

Moreover, policies to subsidize British high-technology industries with a view to increasing world market share in sectors where supernormal profits might be obtained were notably unsuccessful in this period in a number of cases including civil aircraft, which by 1974 had cost £1.5 billion at 1974 prices for a return of £0.14 billion (Gardner, 1976), computers (Hendry, 1989) and nuclear power (Cowan, 1990). A combination of subsidies to American producers linked to defence spending and the relatively small size of the British market undermined these attempts at rent-switching. One sector which did represent a success was pharmaceuticals. It is generally agreed that government policy underpinned this success but it is less clear what have been the relative contributions of different aspects of that policy.

One major impact of government may have been through the demand side and the drug-purchasing policies of the NHS. The Pharmaceutical Price Regulation Scheme (PPRS) has shaped the incentives facing pharmaceutical companies. It is suggested by some that over time this acted as a successful industrial policy which provided a distinctive form of rate of return regulation which could be manipulated by the Department of Health to encourage R and D in the UK (Thomas, 1994). Moreover, given that the industry has earned significant rents on its exports (Garau and Sussex, 2007) this might also be seen as an example of success with strategic trade policy. Other writers are sceptical of this view noting that the UK is a small part of the world market and arguing the quality of the science base is by far the most important factor in location decisions for R & D in pharmaceuticals (NERA, 2007). From this perspective, the most important aspect of government support has been the provision of elite research universities with world-class departments in the key sciences together with public funding for research through the Medical Research Council. This was the view taken by OFT (2007) in its report which argued for the end of the PPRS.

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. Not surprisingly, there is evidence that the British economy was characterized by substantial market power in this period (Crafts, 2012). 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. Finally, econometric analysis found that in the 1970s and 1980s greater competition increased innovation (Blundell et al., 1999) and raised productivity growth significantly in companies where there was no dominant external shareholder (Nickell et al., 1997). Both these results underline the role of weak competition in permitting agency-cost problems to undermine productivity performance.

d) 1979 to 2010

After the election of the Thatcher government, the stance of supply side policy changed markedly. Selective industrial policies were phased out, horizontal policies were downsized and narrowed in scope with the ending of most investment and employment subsidies, while competition in product markets was strengthened considerably, initially through reducing trade barriers and deregulation rather than by strengthening anti-trust policy. Table 6 shows that spending on 1970s style industrial policy had largely been discontinued by the later 1980s. Privatization, reform of industrial relations, and restructuring taxation were the new priorities.

When Labour won a landslide victory in the 1997 election, it was possible to wonder whether in government it would revert to 'Old Labour' policies. The answer soon became apparent and was a resounding 'No'. 1970s-style policy was conspicuous by its absence: there was no nationalization programme, no move to subsidize manufacturing investment, no counterpart of the National Enterprise Board, no return to high marginal rates of direct tax, no attempt to resist de-industrialization by supporting declining industries, and no major reversal of industrial relations reform. Implicitly, the Thatcher supply-side reforms had been accepted. The changes that Labour made were to strengthen some aspects of horizontal industrial policies with a new emphasis on education, R & D, investing in public capital and strengthening competition policy.

In fact, before, during and after Thatcher, government policy 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 implementation of the European Single Market legislation in the 1990s. Trade liberalization in its various guises reduced price-cost margins (Hitiris, 1978; Griffith, 2001). 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, 1996a), and import penetration in manufacturing rose from 20.8% in 1970 to 40.8% by 2000. The downward trend in the mark-up from the 1970s onwards appears to have intensified further after the early 1990s (Macallan et al., 2008). Anti-trust policy was notably strengthened by the Competition Act of 1998 and 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.

Increased competition and openness in the later twentieth century was associated with better productivity performance. 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 TFP growth was inversely related to PMR, a measure of the extent to which product market regulation inhibits competition. 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). 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).⁴ The index of competition policy reported in Table 7 shows British competition policy was still very weak by international standards in 1995 but much stronger ten years later; the analysis in Buccirosi et al. (2009) suggests this was a move conducive to better productivity performance.

The impact of stronger competition was felt at least partly through greater pressure on management to perform and through firm-worker bargains which raised effort and improved working practices. 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). 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 large increases in TFP levels in the period 1988-98 (Harris et al., 2005). The process of privatization raised productivity performance appreciably as nationalized industries were prepared for sale (Green and Haskel, 2004).

An interesting example of this is Rolls-Royce which was nationalized in 1971 and successfully privatized in 1987. In one way, this can be seen as a success for selective industrial policy which saved a company that had made a disastrous error in signing a fixed price contract to supply the RB-211 engine to Lockheed which bankrupted it when development and production costs rose far above initial estimates. Eventually, the sale of Rolls-Royce realized £1.36 bn. for the government compared with net subsidies of £0.83 bn. over the previous 20 years and Rolls-Royce went on to become the highly-profitable, second largest producer of civil-aircraft engines in the world (Lazonick and Prencipe, 2005). It should be noted, however, that it was only as the prospect of privatization loomed in the mid-1980s that, under new management, the company developed a viable business strategy and worked out a cost-effective way of upgrading the RB-211 for the big-engine market.

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. 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

⁴ This comes entirely from more entry and exit rather than a greater productivity impact from entry and exit, see Criscuolo et al. (2004, Table 2).

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).

Selective industrial policy fell out of favour. This was partly because the 1970s experience led to disillusionment and partly because international treaties and, in particular, EU rules on state aids constrained policy. DTI expenditure on industrial policy measures was £421.4 million in 1997/8 (prior to devolution) of which £121.9 mn. was on science and technology schemes, £171.3 mn. for support for small firms, and £128.2 mn. on regional policy, almost all of which went on Regional Selective Assistance (RSA) (Wren, 2001). Whereas in 1981/6 state aids were 3.8 per cent of manufacturing GDP by 1994/6 this had fallen to 0.9 per cent. Virtually all (91%) of state aid in 2006 was for horizontal rather than selective policies (Buigues and Sekkat, 2011).

It is true that politicians were not immune from selective intervention notably close to elections, for example, launch aid for Airbus in 1987, and in 2005 a loan of £6 million to keep the Longbridge plant open for just one more week. The latter was probably ill-judged but taxpayers escaped very lightly by earlier standards.⁵ Airbus appears to have been a successful example of a rent-switching industrial policy (which, although a European venture, has provided opportunities for British wing designers and producers). Neven and Seabright (1995) estimated that Airbus was likely to produce an acceptable rate of return for Europe over fifty years while at the same time reducing Boeing's profits significantly and cutting world-wide aircraft prices a bit.⁶ That said, Airbus would not be easy to repeat – and was possibly illegal under WTO rules.

RSA was on a much smaller scale than earlier policies designed to address unemployment problems in disadvantaged regions. It was designed to create and safeguard employment and targeted heavily at investment in manufacturing for projects which could demonstrate additionality. It was granted on a discretionary basis and has been the subject of many evaluations. The evidence is quite strong that it has been successful in promoting employment at a low cost per job but it is equally clear that it has not raised TFP or labour productivity (Crisuolo et al., 2012; Harris and Robinson, 2004).

Turning to horizontal industrial policies, the picture is mixed both across and within categories although it is fair to say that changes in the composition of expenditure (for example away from investment subsidies towards support for innovation and R & D) has been appropriate, seen from the perspective of addressing market failures that might adversely affect productivity growth.

New growth economics has tended to stress the importance of policies towards education and R & D. In each of these areas, it might be argued there have been some policy successes. The most important changes in education have included expansion of higher education, the national curriculum and league tables for schools. The good news is that, based on international test scores in mathematics and science, the UK showed slow but steady improvement between 1975 and 2003 which regression analysis suggests would have added a small amount to productivity growth, but the bad news is that it is well below the top country (Hanushek and Woessmann, 2009). Nevertheless, growth accounting estimates show a relatively strong contribution to growth in the recent past

⁵ A report by the National Audit Office (2006) concluded this was the case.

⁶ The modelling exercise in Neven and Seabright (1995) is complicated by the presence of McDonnell Douglas. In that firm's absence the value of the Airbus subsidies policy is potentially greater especially in holding down aircraft prices.

based on increasing proportions of the workforce with higher qualifications, as Table 8 shows. With regard to R & D, a policy which seems to have been notably successful in generating positive TFP spillovers is public spending on R & D sponsored by the Research Councils, a result which does not seem to apply to other forms of public R & D (Haskel and Wallis, 2010). The big innovation in policy has been the R & D tax credit introduced in 2001 and subsequently expanded in its coverage. A careful ex-ante study suggested that the policy might raise UK TFP growth by about 0.3 percentage points per year (Griffith et al., 2001), although subsequent analysis has found that estimates of benefit-cost ratios are highly sensitive to methodology (HMRC, 2011).

Unfortunately, with regard to public capital and transport infrastructure the picture is much less encouraging. The UK net stock of public capital relative to GDP, and to the stock of private capital, fell sharply between 1980 and 2000 (from 63.9% to 40.3% and from 61.5% to 37.0%, respectively) and recent levels of public investment imply these ratios will continue to fall over the long run to a level that is clearly suboptimal. To maintain the level of public capital to GDP at a growth maximizing level, investment of about 2.7 per cent of GDP per year would be needed (Kamps, 2005a) but over 1997-2008 the UK invested only 1.5 per cent of GDP. In terms of cost-benefit analysis, Eddington (2006) reported that there was a substantial backlog of road projects with very high benefit-cost ratios (typically strategic roads near urban areas not 'grand projects' like high-speed rail) and estimated that a ten-year programme worth £30 billion was required to catch up with this backlog which would deliver annual welfare benefits of £3.4 billion. Continuing the traditional roads policy, memorably described by Glaister (2002) as 'predict but don't provide', runs the risk of a growing disincentive to private investment and of productivity being impaired as journey times increase (Rice et al. 2006).

The Thatcher period was notable for a shift from direct to indirect taxation as top marginal rates of income tax were reduced and VAT rates increased, and it is certainly true that the revenue from 'distortionary taxes' is much smaller as a proportion of GDP than in many European countries. Nevertheless, it is still fair to say that UK policy has been quite timid in making the sort of reforms that recent OECD research suggests would be most effective in stimulating long-run growth. This would entail reducing the effective rate of corporate tax while extending the VAT base. The effective average corporate tax rate in 2007 was only about 2 percentage points lower than in the early 1980s (Devereux, 2007) while the current VAT regime with many exemptions entailed revenue of only about 48 per cent of that which would be raised if VAT was applied to all consumer expenditure. Using the estimates in HM Treasury (2007), imposing the standard rate of VAT on everything except food would allow a reduction of 12 percentage points in the corporate tax rate which the OECD study estimates would raise the labour productivity growth rate by about 0.25 percentage points per year over 10 years (Johansson et al., 2008).

The UK has benefited more than most European countries from the adoption of ICT, as is reflected in Table 8. The diffusion of ICT has been aided by complementary investments in intangible capital and high-quality human capital and importantly also by regulation policies. The international evidence is that diffusion of ICT has been significantly inhibited in countries which are heavily regulated. Employment protection has been shown to deter investment in ICT equipment (Gust and Marquez, 2004) because reorganizing working practices and upgrading the labour force, which are central to realizing the productivity potential of ICT, are made more expensive. Research at OECD indicates

that restrictive product market regulation has deterred investment in ICT capital directly (Conway et al., 2006) and the indirect effect of regulation in raising costs has been relatively pronounced in sectors that use ICT intensively.

For the UK, 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 to its relatively successful response to new technology, as OECD cross-country comparisons reveal.⁷ 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.

This leads us to the important qualification that has to be made regarding the 'success story' rehearsed above. De-regulation was central to the growth of an unusually large financial services sector in the UK, amounting to about 8 per cent of GDP in 2007, and a banking system that was very highly leveraged by previous standards. This left the UK exposed to a very costly financial crisis which may well have permanently reduced the sustainable level or even the trend rate of growth of real GDP, possibly substantially. In time, it will be possible to reassess the growth performance of the late 20th and early 21st century with these issues in mind but at present it is too soon to tell.

It should be noted, however, that not all UK regulation is productivity friendly. Land-use planning is an aspect that creates massive allocative inefficiency and reduces labour productivity both by making land unduly expensive and by restricting city size which means that agglomeration economies are foregone and spatial adjustment is impeded – successful British cities are too small (Leunig and Overman, 2008). Cheshire and Sheppard (2005, p. 660) concluded that 'controlling land supply by fiat has created price distortions on a par with those observed in Soviet-bloc countries'. One of the implications is an implicit regulatory tax rate of around 300 per cent which makes office space in cities like Leeds and Manchester much more expensive than even New York and San Francisco (Cheshire and Hilber, 2008). Similarly, planning policy by making land for retailing very expensive and by constraining retailers to choose less productive sites has reduced the level of TFP in the sector by at least 20 per cent – TFP in new stores has been falling steadily since the late-1980s (Cheshire et al., 2011).

These findings, together with suboptimal investment in transport are quite worrying in the context of the role of agglomerations in underpinning productivity and competitive advantage. Graham (2007) analysed productivity on a very disaggregated spatial basis and found it was very strongly related to measures of market potential, in particular proximity to GDP defined in terms of time rather than distance, with elasticities being much larger for services than manufacturing and particularly big for financial and business services. Similar results were obtained by Rice et al. (2006) who found labour productivity in a city depends on its own size and the size of populations up to 80

⁷ 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).

minutes travel time away. Their results indicate that if all journey times in the UK were cut by 10 per cent, labour productivity would increase by 1.2 per cent.⁸

Finally, it may be useful to look at the UK in terms of its ability to adjust to the challenges resulting from globalization, in particular, the rise of dynamic Asia. This turns on export mix, the flexibility of labour and product markets, strengths in innovation and education according to the index devised by Rae and Sollie (2007). They found that the UK ranked 8th of 26 OECD countries based on having a relatively small share of low-technology and a relatively large share of high-technology exports, a labour market which redeploys workers relatively quickly and has limited insider power, strong product market competition together with respectable scores on education and innovation.

That said, it should be recognized that productivity performance in the UK not only exhibits agglomeration benefits but also has quite a strong regional component. Econometric analysis of production functions finds that, across all sectors, plants in the South East have a substantial TFP advantage over the rest of Britain (Harris and Moffat, 2011). This suggests that resilience in the face of foreign competition would be strengthened by the removal of some of the obstacles to spatial adjustment to the challenges of globalization that are imposed by the planning system and sub-standard transport infrastructure.

4. Policy Lessons

It is important not to forget the lessons of historical experience; to do so is to risk repeating past mistakes, some of which have been very expensive. It is also worth recognizing that prior to the crisis growth performance was respectable and that, by 2007, the UK had regained parity with France and West Germany in terms of real GDP per person, an outcome that would have looked most unlikely at the end of the 1970s after decades of relative economic decline compared with those countries.

A very strong message related to this is that the UK benefited greatly from strengthening competition in product markets by abandoning protectionism, de-regulating and, eventually, strengthening competition policy. This addressed long-standing problems of industrial relations and bad management which had appeared intractable. The empirical evidence is unequivocal; increased competition promoted better productivity performance. At the same time, it is equally clear that selective industrial policy has deservedly got a bad name. The evidence of the 1960s and 1970s is that it delivered a very poor payoff and was hijacked by politicians who were afraid of deindustrialization and creative destruction with the result that it was skewed towards backing losers like British Leyland and British Shipbuilders. A big implication, as stressed by Aghion et al. (2011) is that, if there is to be a return to a more active industrial policy, it should be designed to minimize the adverse effects on competition.

A second key point is that good horizontal industrial policies are important in supporting productivity performance in the private sector. Here it is important to note that a wide range of government policies are relevant, including for example, regulation, rather than just the obvious categories such

⁸ Their results imply that the UK's past investments in its motorway network had a favourable impact on productivity since average journey time between major cities fell by about 40 per cent between 1959 and 2006 (RAC Foundation, 2007).

as provision of infrastructure and education, and that policies which facilitate diffusion of new technologies can be expected to have a bigger impact than those which seek to promote invention. Planning rules may well matter more for productivity than R & D subsidies. In fact, the evidence suggests the UK has benefited considerably from having light regulation which has been helpful in taking advantage of the opportunities of ICT but has questions to answer about the quality of its education as reflected in cognitive skills well below the world leaders and underinvestment in transport infrastructure.

A third, and rather depressing, message is that the politics of improving growth performance are not very attractive. The problems include the short-termism of politicians in an area where the policy choices often involve status-quo bias, the distributional implications of some policy options, and the fact that many worthwhile policy moves will attract no positive headlines. It is unfortunate that this has severely constrained supply-side policy, for example, by making serious pro-growth reforms to the tax and planning systems no-go zones.

Finally, it is increasingly apparent that an important aspect of productivity performance and choice of location in a world of vertically-disintegrated international trade is an ability to develop and to sustain successful agglomerations whose advantages are hard to replicate elsewhere. Productivity advantages from an agglomeration which developed on the basis of market forces sustained the Lancashire cotton industry against low-wage Asian competition for many decades. That is a useful example to bear in mind in a globalizing world.

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Table 1. Real GDP/Head (UK = 100 in each year)

| | <i>USA</i> | <i>West Germany</i> | <i>France</i> |
|------|-------------------|----------------------------|----------------------|
| 1870 | 76.6 | 57.6 | 58.8 |
| 1913 | 107.8 | 74.1 | 70.8 |
| 1929 | 125.3 | 73.6 | 85.6 |
| 1937 | 103.4 | 75.4 | 72.2 |
| 1950 | 137.7 | 61.7 | 74.7 |
| 1979 | 142.7 | 115.9 | 111.1 |
| 2007 | 132.6 | 98.6 | 94.3 |

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. ICT and Long-Run Growth Potential (% per year)

| | <i>ICT-Use Own β</i> | <i>ICT-Use Swedish β</i> | <i>ICT-Output</i> |
|---------|---------------------------------------|---|-------------------|
| France | 0.48 | 0.68 | 0.17 |
| Germany | 0.44 | 0.68 | 0.33 |
| Italy | 0.36 | 0.70 | 0.19 |
| Spain | 0.53 | 0.76 | 0.10 |
| Sweden | 0.70 | 0.70 | 0.24 |
| UK | 0.60 | 0.66 | 0.16 |
| USA | 0.70 | 0.71 | 0.22 |

Note: β is the factor share of ICT capital; a high value indicates relatively successful diffusion and is conducive to a higher growth contribution. The estimates assume that the real price of ICT equipment continues to fall at 7% per year and the steady-state growth implication is derived using a neoclassical growth model with 2 types of capital

Source: Oulton (2010)

Table 3. Sources of Growth in Real GDP/Hour Worked in the UK Market Sector, 1990-2008 (% per year)

| | 1990-95 | 1995-2000 | 2000-08 |
|-------------------|----------------|------------------|----------------|
| Tangible Capital | 0.95 | 0.74 | 0.67 |
| Labour Quality | 0.17 | 0.25 | 0.16 |
| R & D | 0.05 | 0.04 | 0.05 |
| Other Intangibles | 0.58 | 0.63 | 0.47 |
| TFP | 1.19 | 1.87 | 0.90 |
| Total | 2.94 | 3.53 | 2.25 |

Notes:

Derived using the formula $\Delta(Y/HW)/(Y/HW) = \alpha(\Delta TK/HW)/(TK/HW) + \beta(\Delta HK/HW)/(HK/HW) + \gamma(\Delta RD/HW)/(RD/HW) + \delta(\Delta IK/HW)/(IK/HW) + \Delta A/A$

where TK is tangible capital, HK is human capital, IK is intangible capital, RD is the stock of R & D, all weighted by their factor shares, and A is TFP, HW is hour worked. Intangible capital includes capital services from mineral exploration and copyright, from design, from advertising and market research, from firm-level training and from organizational capital.

Source:

Dal Borgo et al. (2012)

**Table 4. Top 6 Sectoral Contributions to Labour Productivity Growth, 1995-2007
(% per year)**

| | <i>Value-added share weight</i> | <i>Growth Rate of Real GDP/HW</i> | <i>Contribution</i> |
|----------------------------------|-------------------------------------|---------------------------------------|---------------------|
| Wholesale and Retail Trade | 0.123 | 3.05 | 0.38 |
| Post & Telecommunications | 0.030 | 9.00 | 0.28 |
| Business Services | 0.220 | 1.06 | 0.23 |
| Financial Services | 0.046 | 4.23 | 0.19 |
| Electrical and Optical Equipment | 0.021 | 6.64 | 0.14 |
| Transport & Storage | 0.048 | 2.58 | 0.12 |

Source: EUKLEMS database.

Table 5. Trade Costs Index, 1929-2000

| | <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.

Source: data underlying Jacks et al. (2011) kindly supplied by Dennis Novy.

Table 6. Grant-Equivalent Expenditure on Industrial Subsidies (£mn. 1980 prices)

| | <i>Investment</i> | <i>Employment</i> | <i>Industrial Support</i> | <i>Civil Aircraft</i> | <i>Shipbuilding</i> | <i>Technology & Other</i> | <i>Total</i> |
|---------|-------------------|-------------------|---------------------------|-----------------------|---------------------|-------------------------------|--------------|
| 1963/4 | 2680 | | 15 | 70 | | | 2765 |
| 1964/5 | 2922 | | 14 | 62 | | | 2996 |
| 1965/6 | 2632 | | 10 | 93 | 22 | | 2757 |
| 1966/7 | 1121 | 1226 | 2 | 144 | 25 | | 2518 |
| 1967/8 | 1302 | 3474 | 7 | 213 | 30 | | 5026 |
| 1968/9 | 1554 | 3794 | 48 | 272 | 56 | | 5724 |
| 1969/70 | 1814 | 4988 | 36 | 292 | 143 | | 7273 |
| 1970/1 | 2133 | 6352 | 41 | 269 | 124 | | 8919 |
| 1971/2 | 2496 | 3458 | 35 | 400 | 47 | | 6436 |
| 1972/3 | 2732 | 2199 | 57 | 345 | 102 | | 5435 |
| 1973/4 | 3188 | 695 | 97 | 235 | 108 | | 4323 |
| 1974/5 | 3467 | 361 | 50 | 276 | 232 | | 4386 |
| 1975/6 | 3870 | 406 | 30 | 211 | 125 | | 4642 |
| 1976/7 | 4130 | 499 | 52 | 67 | 128 | | 4876 |
| 1977/8 | 4482 | 254 | 497 | 37 | 153 | 6 | 5429 |
| 1978/9 | 4902 | 193 | 344 | 83 | 84 | 17 | 5623 |
| 1979/80 | 4483 | 125 | 300 | 22 | 105 | 33 | 5068 |
| 1980/1 | 4050 | 365 | 373 | 7 | 108 | 39 | 4942 |
| 1981/2 | 3754 | 226 | 469 | 1 | 118 | 62 | 4630 |
| 1982/3 | 3622 | 185 | 322 | 7 | 78 | 83 | 4297 |
| 1983/4 | 3195 | 91 | 103 | 8 | 52 | 99 | 3548 |
| 1984/5 | 2317 | 30 | 16 | 44 | 37 | 109 | 2553 |
| 1985/6 | 1507 | 22 | 9 | 53 | 54 | 107 | 1752 |
| 1986/7 | 756 | 19 | 3 | 57 | 11 | 93 | 939 |
| 1987/8 | 223 | 10 | 1 | 61 | 30 | 77 | 402 |

Notes: 'industrial support' excludes aircraft and shipbuilding and is mainly given to the motor industry; 'other' includes business consultancy and small firms loan guarantee schemes.

Source: Wren (1996a)

Table 7. Competition Policy Indicator (0-1)

| | 1995 | 2005 |
|----------------|-------------|-------------|
| France | 0.45 | 0.52 |
| Germany | 0.49 | 0.52 |
| Italy | 0.41 | 0.44 |
| Netherlands | 0.42 | 0.53 |
| Spain | 0.36 | 0.42 |
| Sweden | 0.69 | 0.66 |
| United Kingdom | 0.31 | 0.60 |
| USA | 0.59 | 0.62 |

Note: first year for Netherlands is 1998 and for Spain is 2000.

Source: Buccirossi et al. (2009).

Table 8. Growth Accounting for Labour Productivity Growth in the Market Sector, 1995-2005 (% per year)

a) Growth Accounting

| | <i>Labour Quality</i> | <i>ICTK/HW</i> | <i>Non-ICT K/HW</i> | <i>TFP</i> | <i>Labour Productivity Growth</i> |
|-------------|-----------------------|----------------|---------------------|------------|-----------------------------------|
| Ireland | 0.2 | 0.4 | 2.1 | 1.8 | 4.5 |
| Sweden | 0.3 | 0.6 | 1.1 | 1.6 | 3.6 |
| Finland | 0.1 | 0.6 | -0.1 | 2.6 | 3.2 |
| UK | 0.5 | 0.9 | 0.4 | 0.8 | 2.6 |
| Netherlands | 0.4 | 0.6 | 0.1 | 1.0 | 2.1 |
| France | 0.4 | 0.4 | 0.4 | 0.9 | 2.1 |
| Austria | 0.2 | 0.6 | 0.1 | 1.1 | 2.0 |
| Portugal | 0.2 | 0.6 | 1.3 | -0.3 | 1.8 |
| Belgium | 0.2 | 1.0 | 0.4 | 0.1 | 1.7 |
| Denmark | 0.2 | 1.0 | 0.2 | 0.2 | 1.6 |
| Germany | 0.1 | 0.5 | 0.6 | 0.4 | 1.6 |
| Spain | 0.4 | 0.3 | 0.5 | -0.8 | 0.4 |
| Italy | 0.2 | 0.3 | 0.5 | -0.7 | 0.3 |
| | | | | | |
| USA | 0.3 | 1.0 | 0.3 | 1.3 | 2.9 |

Source: Timmer et al. (2010).