

## **Competition and growth in historical perspective**

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### **1. Introduction: theoretical perspectives**

The economic argument in favour of competition that undergraduates learn is essentially static in nature. Restrict competition, by permitting monopolies or collusive behaviour, and you will see lower output, higher prices, and consequent welfare losses. This argument does not, however, address a far more interesting and important issue: what are the consequences of competition, or a lack of competition, for growth?

Here, as is well known, theory is ambiguous. On the one hand, growth is fuelled by innovation, and innovation is ultimately driven by the search for profits. Too much competition might mean too few profits, and no incentive to innovate. This Schumpeterian argument may imply the need for policy makers to engage in a delicate balancing act: as Rodrik (2005, p. 1006) puts it, "There must be enough competition to ensure static allocative efficiency, but also adequate prospect of rents to spur innovation." The need for rents is explicitly acknowledged in patent systems, which grant temporary monopoly rights to innovators.

On the other hand, while competition may lower the rents of innovating firms, it may make life even more difficult for firms who do not keep up (Aghion and Howitt, 2006, p. 280). As Webb (1980, pp. 319-320) puts it, "restraint of competition leaves the carrot but removes the stick as incentives for maximizing efficiency. Firms still gain by minimizing cost, but the threat of bankruptcy does not drive them to do so." Competition may thus force innovation on firms who might otherwise be reluctant to engage in it, for example because their managers would prefer to enjoy Hick's (1935, p. 8) famous "quiet life".

Aghion and Howitt (2006) develop a theoretical model that tries to combine both the Schumpeterian and the Hicksian effects. In very lop-sided industries, with

one extremely dominant player, that firm will not be under competitive pressure from its rivals in any case, and might require the carrot of profits in order to innovate. In more symmetric industries, on the other hand, more competition means a greater struggle to survive, and faster innovation and growth. Aghion and Howitt speculate that during Europe's catch-up phase after World War 2, its firms were all laggards vis à vis their US counterparts, and were thus not exposed to "neck and neck" competition with them; the lure of monopoly profits might have been required to get European firms to innovate and grow. Today, on the other hand, with Europe closer to the technological frontier, and more of its firms in "neck and neck" competition with the technological leaders, competition should logically provide a much bigger boost to innovation and growth.

The argument sits well with a more general point made by Aghion and Howitt, and emphasised by generations of economic historians: the institutional framework that is optimal in one period may not necessarily be optimal in all. In the context of the "right" degree of competition, this could vary over time, and presumably not only for the reasons highlighted by Aghion and Howitt. The relationship between competition and growth is thus theoretically ambiguous, and theoretical ambiguity implies the need for empirical work. Since the relationship may well have changed over time, there is also a need for historical perspective, to see whether and to what extent it was contingent on time and place. This paper thus provides a brief introduction to the historical literature on the relationship between competition and growth. It proceeds in three stages. First, it surveys some of the work that has been done on the relationship between monopoly, cartels, competition and growth at various key stages in recent economic history. As can be seen, the "right" degree of competition seems to have been extremely context-specific. Second, the paper acknowledges that a key dimension of competition policy, de facto, is trade policy, especially in smaller countries. It thus provides a survey of the historical literature on the relationship between trade policy and growth, which yields similarly ambiguous and context-dependent conclusions. Third, competition operates on growth via the supply side, and there is an obvious interest in supply-side policies to boost growth in Europe today, given the political constraints that lie in the way of

adopting more adequate demand-side policies, which might effectively combat the alarming slump in Eurozone growth which today clearly merits the label “Depression”. The paper thus comments relatively briefly on the relationship between competition policy and growth during deep recessions and depressions.

## **2. Monopoly and cartels versus competition**

The relative costs and benefits of more or less competitive product markets have varied over time, as the technological, economic and even the geopolitical environment changed.

### *The mercantilist era: monopolistic trading companies*

The great period of monopoly was of course the mercantilist era. During the centuries between the Voyages of Discovery and the Napoleonic Wars, the greatest corporations in the world were European trading companies that had been granted monopoly privileges in the trade between the home country concerned and the rest of the world. These monopolies could be relatively easily enforced in domestic markets; where possible, they were extended to exclude foreign rivals from particular overseas markets supplying the goods which the trading companies then brought back to Europe. This ultimately required the use of military force.

There has been a debate in the literature about the cost of mercantilist restrictions, but while informative it perhaps rather misses the point. The mercantilist era was one in which there were no international institutions promoting international security, and in which European countries were involved in a struggle for regional and global supremacy in some cases, and for survival in others. In this context, the rents associated with monopolizing particular trade routes were one source of the “plenty” that was required to sustain power; and power was in turn required in order to obtain these rents in the first place. In such a world, unilateral moves to peaceful free trade were not a

realistic option for individual states; it required the establishment of British naval hegemony through force of arms for the world economy to transition to a more peaceful state (Viner, 1948; Findlay and O'Rourke, 2007).

In a recent paper, Peter Solar (2013) shows that British naval hegemony was an important factor leading to lower transport costs in the 19<sup>th</sup> century, since it made it possible for traders to switch from large, heavily armed boats to smaller vessels that were cheaper to build and required smaller crews. Solar argues that this shift, as well as the move towards copper sheathing, were much more important factors than a decline in monopoly profits in lowering trans-oceanic price gaps during the transition from the mercantilist to the modern era. The implication is that monopoly was not as costly as had been traditionally thought (although it should be noted that what was true at the very end of the mercantilist period may not have been true earlier on); but Solar goes further and argues that monopoly was actually a sensible a way of organising long-distance trade before British hegemony had been established:

In a world of war, privateering, and piracy, the use of large, armed ships by the chartered companies made sense and, as these vessels also made excellent privateers, their use by all the European companies can be thought of as the outcome of an arms race...Since large, armed ships were expensive to build and operate and difficult to deploy in other trades, their construction required a long- term commitment. The VOC built its own ships while the EIC signed long-term contracts with private shipowners. Both chartered companies' monopoly on trade prevented private shippers—using smaller, cheaper vessels—from cherry-picking in periods of peace. In the context of this arms race, the chartered monopoly was thus an effective way of organizing trade (Solar, 2013, p. 650).

Only when the Royal Navy (and thus, ultimately, the British taxpayer) provided maritime security as a public good available to all did this economic advantage of monopoly disappear.

*The late 19<sup>th</sup> century: German cartels, British competition*

After Trafalgar, and the final British victory in 1815, the old rationale for monopolizing overseas trade ceased to apply. This geopolitical revolution coincided with a technological and economic revolution, the Industrial Revolution, which remained ongoing for the remainder of the century. The key innovations of the “First Industrial Revolution” were in textile manufacturing and metallurgy. Economies of scale in the former sector were sufficient to wipe out domestic production, but not so important as to produce monopoly: the textile sector retained a relatively competitive market structure. However, the same was not necessarily true of coal extraction and metallurgy.

There has been a lengthy debate about the consequences of cartels in these two sectors in Imperial Germany, which saw rapid industrialization focused on the heavy industries of the Ruhr. According to Kocka (1978, p. 563), their initial development was favoured by the long deflation which occurred between 1873 and 1896, although their numbers greatly increased thereafter: there were 4 in 1875, 106 in 1890, 205 in 1896, and 385 in 1905. Early attempts to form cartels often failed, however, due to free-riding and other problems: as late as 1893, for example, the Ruhr coal industry was essentially a competitive one (Bittner, 2005, p. 338). However, in February of that year the RWKS (Rhenish-Westphalian Coal Syndicate) was founded by 98 firms which jointly accounted for 87% of Ruhr coal output, a figure which had increased to almost 99% by 1903 (Burhop and Lübbers, 2009, p. 504).

The RWKS served as a model for many other cartel arrangements. In 1907, cartels accounted for “82 per cent of the production of hard coal, 100 per cent of potash, 48 per cent of cement, 50 per cent of crude steel, and 90 per cent of paper, but only 5 per cent of leather and linoleum production, 20 per cent of iron

and steel manufactured goods, and 2 per cent of machines and implements” (Kocka, 1978, p. 564).

In addition to cartels between firms that remained independent, competition in Imperial Germany was also reduced by mergers which led to “large and integrated concerns with a central administration” (Kocka, 1978, p. 564). A third factor reducing competition was import tariffs. Prussia had participated in the network of bilateral trade treaties signed in the wake of the 1860 Anglo-French Cobden-Chevalier treaty, and tariffs were further reduced in the newly unified German Empire, in both 1873 and 1875. In 1877 tariffs were abolished on “nearly all iron manufactured goods”, and according to Paul Bairoch (1989, p. 41) “Germany had virtually become a free trade country, probably the most liberal of the major continental European countries.” However, in 1879 Bismarck embarked on a dramatic U-turn, imposing heavy duties on most products (raw materials excepted), in what has since been described as the “Marriage of Iron and Rye”. Tariffs were further increased during the 1880s, and despite a certain easing during the 1890s under Bismarck’s successor, Caprivi, Germany remained firmly protectionist until the outbreak of the First World War. These tariffs were important in providing a floor under prices which helped underpin domestic German cartels.

There has been a substantial debate in the literature regarding the impact of these various anti-competitive practices. What is interesting, given the informal presumption that competition is necessarily good for growth, is that the traditional literature usually argued that cartels were beneficial in a number of ways. Kocka (1978, p. 564) offers a nuanced assessment. On the one hand, he downplays the role of cartels, which “scarcely altered the production context itself at all”. On the other hand, he argues that both mergers and cartels “led to greater steadiness in production and prices”, and that mergers implied “large and integrated concerns with a central administration” which could “utilize the technical advantages of purposeful integration of the separate processes of production and hence could achieve economies of scale”.

Webb (1980) is the best-known contribution to the English-speaking literature on the subject, focussing on cartels in the Imperial German steel industry. He argues that tariffs and cartels were an integrated system and should therefore be analysed jointly, since as already noted attempts to restrain domestic competition would have been ineffective without an effective curb on imports which placed a floor under prices in Germany. At the same time, German steel companies exported abroad at prices that were below domestic prices, if not necessarily below cost (p. 310). Cartels obviously raised profits in the steel industry, for the usual reasons, but this came at the cost of raising costs for small downstream firms facing higher input prices. Nevertheless, Webb argues that despite this negative side-effect steel cartels may actually have been beneficial for the German economy as a whole.

In particular, he speculates that they encouraged the development of large, vertically integrated, capital-intensive, and technically efficient firms that were able to out-compete their rivals in Britain and elsewhere. They did this for three reasons. First, cartels encouraged backward vertical integration: better to produce your own inputs yourself, than to pay cartel prices for them. Second, they encouraged forward integration into downstream product lines not covered by cartel agreements, allowing firms to make full use of their capacity by expanding sales in this manner. Vertical integration in turn promoted efficiency. And third, by limiting fluctuations in demand (and thus in prices and quantities), cartels lowered the risk involved in investing in very capital-intensive modern technologies with high fixed costs. Cartels thus incentivised German firms to install the most up-to-date and efficient technology.

Recent cliometric contributions have tended to somewhat downplay the role of late 19<sup>th</sup> century German cartels. However, they have focussed on the coal industry, rather than iron and steel. Bittner (2005) conducts an event study of the implications of the formation of the RWKS (Rhenish-Westphalian Coal Syndicate) in 1893 on the risk and return characteristics of securities issued by the firms involved; he finds only moderate effects, and suggests that this may imply that this cartel, one of the most important in Germany, had a smaller

impact than is commonly supposed. An obvious potential problem with Bittner's approach is that he is only looking at stock market data, and one can only draw strong conclusions from these if one takes the view that the market accurately analysed the impact of the cartel on its members.

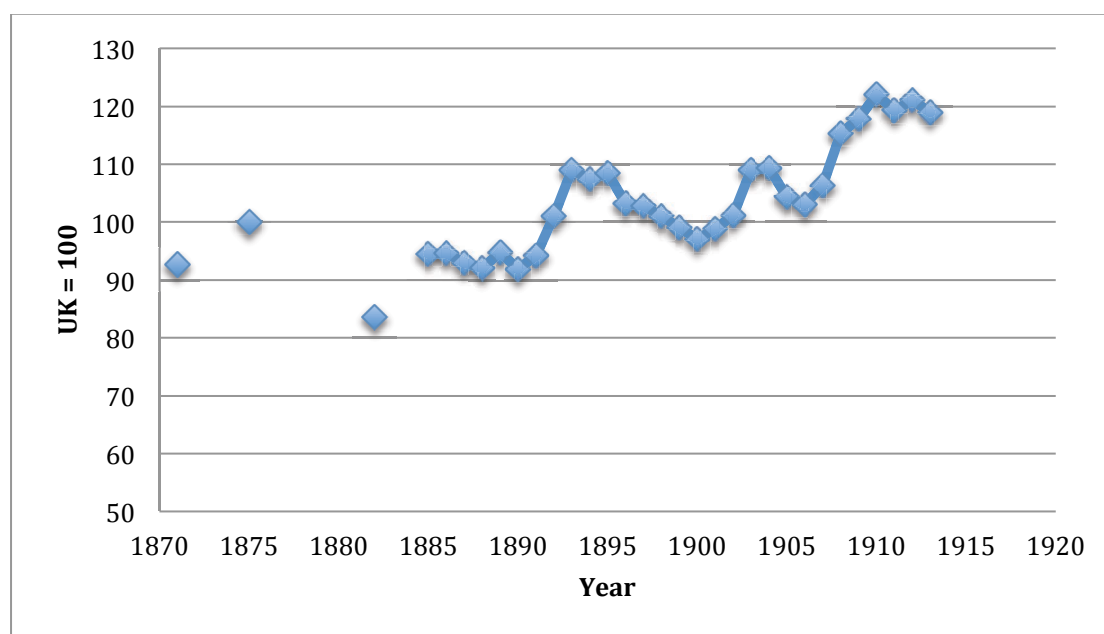
More recently, Burhop and Lübbers (2009) use stochastic frontier techniques to estimate production functions for coal firms in Imperial Germany. They find that membership of the RWKS had no discernable effect on the productivity of firms – there is thus no evidence that cartel members slackened off, or that productive efficiency suffered as a result. On the other hand, neither do they find that cartel membership increased productivity. As in the case of Bittner (2005), the conclusion is that cartels were not as important a factor as was once thought. Neither of these recent papers speaks directly to Webb's, however, since there is no reason to believe that the consequences of cartels would necessarily be the same in iron and steel as in coal mining.

Webb's argument seems *a priori* plausible in the context of the iron and steel industry of the period, characterised as it was by economies of both scale and scope. It is certainly the case that the German iron and steel industry was much more dynamic than its free-trading, competitive British counterpart during this period. Admittedly, Bob Allen (1979) argues that excess profits in the German industry hurt its competitiveness during the 1850s and 1860s, but he also shows that this was not the case subsequently. More importantly, from the 1870s onwards the German iron and steel industry increased its productivity more rapidly than its British counterpart.

You might argue that this sectoral success came at the expense of costs in downstream industries, but there is no evidence that a cartelized German metallurgical sector imposed costs on German industry as a whole. Figure 1 plots Stephen Broadberry's (1997a) data on German manufacturing labour productivity, relative to that in Britain, between 1871 and 1913. The trend was clearly upwards, with a marked increase from the 1890s onwards, which is when cartels were becoming more prevalent in Germany. Similarly, Broadberry's



(2006, p. 109) data on relative total factor productivity in the two economies show rapid relative progress in Germany between 1891 and 1911. German industrial TFP was almost 10% lower than British industrial TFP in 1891, but was more than 5% higher in 1911, and there was impressive German TFP catch-up (from 63% to 75%) at the level of the aggregate economy as well.



**Figure 1. Relative manufacturing labour productivity (Germany/UK), 1871-1913**

Source: Broadberry (1997b, Table A3.1(c), pp. 48-50)

Meanwhile, US Steel increasingly dominated the US steel industry during this period, and this did not stop US industry from outcompeting its British counterpart either. Allen (1979) finds that like Germany, the US also managed to increase productive efficiency in the iron and steel industry more rapidly during this period than did Britain. Once again, there is no evidence that a relative lack of competition harmed productive efficiency, or slowed technological change in the steel industry during this period. Nor is there any evidence that the less competitive market structure in this key sector in the US imposed costs on the broader US economy. Relative TFP in the two countries remained relatively constant between 1871 and 1911 – there was some British catch-up in terms of

industrial TFP between 1871 and 1891, followed by retrogression between 1891 and 1911 (Broadberry, 2006, p. 109); aggregate growth in the US was of course substantially faster.

The argument that competition necessarily spurs growth does not sit well with the failure of British industry to innovate as rapidly as its German and US counterparts during this period: the British economy is widely recognized as having been extremely competitive in the decades before the First World War (Crafts, 2012, p. 19). Even worse for the Hicksian hypothesis that competition provides a necessary stimulus to growth is the fact that British entrepreneurs during this period were traditionally accused of sleeping on the job, preferring routine and tradition to innovation. Not surprisingly, perhaps, cliometricians have spent a fair amount of time attempting to debunk this “entrepreneurial failure” hypothesis, arguing for example that British entrepreneurs were rational in their decision to stick with mule spinning in the cotton textiles sector, rather than switching to ring spinning (see for example Leunig 2001, or Crafts 2012 who provides a brief survey of the literature).

If there had indeed been entrepreneurial failure in Victorian or Edwardian Britain, that would certainly be a big problem for the Hicksian thesis that competition spurs efficiency. Even if there was no entrepreneurial failure, however, in the sense that British entrepreneurs were maximising profits, that does not mean that the British economy of the period did not “fail”, or that it could not have done better. Only the sorts of very simplistic neoclassical competitive models where market failures are excluded by assumption would generate that conclusion, and while first generation cliometricians took those models very seriously, microeconomic theory has moved on since then. The Hicksian argument may rely on competition eliminating X-inefficiency, but standard models of market failure typically generate market failure, not as a result of a failure of managers to maximise profits, but as a result of their incentives not being aligned with those of society as a whole.

At a minimum, we can safely conclude that the less competitive German and American environments did not preclude German or US success during this period. We can also safely conclude that the more competitive British environment did not guarantee it. But that seems like an extremely cautious conclusion to draw from the evidence, which is that the Germans and Americans did in fact power ahead of the British during this period, especially in sectors which they protected, and especially in sectors which were characterised by less-than-perfect competition in Germany and the US, but which were competitive in Britain. It is right and proper that cliometricians try to assess causality by considering counterfactuals (might German and American industry have been even more efficient if competition had been more intense? Might British industry have done even worse than it did if competition had been more restrained?) but sometimes the “raw facts” speak eloquently enough, and we should be willing to listen to them and at least be willing to concede the possibility that our a priori expectations (which it should be noted tend to be embodied in the theoretical models which we use to calculate counterfactuals) do not match the data.

Two further points seem worth making.

First, while tariffs, mergers and cartels limited competition on the domestic market in Germany, German firms competed ferociously when exporting overseas. There was therefore still an incentive to keep improving product quality and cost efficiency, rather than to enjoy the “quiet life”. Policies that restrict competition domestically or that promote “national champions” can be consistent with the Hicksian efficiency advantages that competitive pressures can give rise to, if the sectors concerned compete on export markets; perhaps part of the problem which British industry faced was that its entrepreneurs were too willing to fall back on Imperial markets (although it should be stressed that foreigners were also able to export to those markets).

Second, even if Webb is correct, it does not necessarily follow that the German “tariff-cartel system” of the late 19<sup>th</sup> century provides a model for other countries to follow in other periods, even in the metallurgical sector. The

argument relies on vertical integration and large, capital-intensive firms in the iron and steel industry being the most efficient, and the most capable of adopting the latest technologies. This may have been true at the time and for a good while subsequently. It is not necessarily true today, however: as is well known, since the 1980s smaller, electrically-powered mini-mills have become increasingly dominant in the steel industry, and firms in the sector have become more specialized. Indeed, leading mini-mill firms such as Nucor have outsourced their supply of scrap to independent companies (Holmström and Roberts, 1998, pp. 83-4). The right form of industrial organisation, and the right policy mix, may depend on the technological context, and may thus be period-specific.<sup>1</sup>

### *The twentieth century*

The twentieth century (which we will take to have started in 1914) can be viewed either as a single entity, or as three distinct periods. If the focus is on technological developments, then Robert Gordon (1999; 2012) argues convincingly that the entire century should be seen as a single entity, defined by the inventions of the Second Industrial Revolution (he emphasizes electricity, the internal combustion engine, chemicals and petroleum, indoor plumbing, and the communications and entertainment industries). If the century is taken to extend until today, rather than to have ended in, say, 1990, then one would want to add the key technology of the Third Industrial Revolution to the list, the Internet, although Gordon is sceptical about how important a breakthrough this really is.

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<sup>1</sup> Indeed it may be sector-specific as well: Zitzewitz (2003) shows that competition was good for productivity in the UK and US tobacco industries during the late 19<sup>th</sup> century. US relative productivity suffered after the American Tobacco trust was formed in 1890, and advanced when the trust was broken into 12 competing firms in 1911; UK relative productivity suffered in 1902 when its industry was monopolized. On the other hand, monopolies and cartels are not the same, though they both serve to restrict output and raise prices. In the latter, there are several firms, not one, and there may thus still be competition on export markets, or on dimensions other than price and quantity.

If the century is defined in terms of the international economic environment, on the other hand, then it is conventionally divided into either three or four periods: the interwar period, defined by the Great Depression; the “Golden Age” from 1950-1973; and the post-1973 period, with a break, perhaps, in 1990 when the world economy started to become much more globalized, and there was a slight acceleration in US productivity growth.

The interwar period saw a move away from the market and towards more state intervention, as agents interpreted the chaos created by misguided macroeconomic policies as being due to the failures of the market mechanism itself. There was also a move away from competition and towards industrial consolidation, with Italy's *Istituto per la Ricostruzione Industriale* (IRI) being a particularly striking example. IRI controlled 48.5% of Italy's share capital in January 1934; in 1937 it controlled 100% of the military steel sector, 40% of the non-military steel sector, and 30% of the electricity sector (James and O'Rourke, 2013, p. 59). What is more, in 1932 joining industrial cartels was made compulsory, while a law the following year made it difficult for new firms to enter existing industries (Giordano and Giugliano, 2014, p.7). German heavy industry remained concentrated, while British industry became increasingly cartelized.

Stephen Broadberry and Nicholas Crafts have been the most vocal proponents of the view that the cartelization of British industry in the interwar period was detrimental to the performance of the British economy, both then and subsequently. In an early contribution (Broadberry and Crafts, 1992) they explore the relative productivity of US and UK firms across industries in the mid-1930s. In the context of a cross-section regression they find that more concentrated industries in the UK were at a bigger productivity disadvantage *vis à vis* their US counterparts. This type of interwar evidence is not just limited to Britain: Giordano and Giugliano (2014) find some econometric evidence in a panel of Italian industries that concentration was negatively related to labour

productivity in both levels and first differences between 1921 and 1951.<sup>2</sup> On the other hand, Hannah and Temin (2010) point out that Broadberry's own data show British total factor productivity in both industry and the economy as a whole doing fairly well compared with the US during the 1930s; that Britain was responsible for many key inventions during the period; and that industries such as cotton, steel and coal that are singled out by Broadberry and Crafts as epitomizing the negative impact of politically powerful producers during the 1930s in fact increased their relative productivity during the period.

Hannah and Temin admit that the Broadberry and Crafts view "is more plausible if the policies of the 1930s are seen as storing up trouble for what turned out to be a rather different future" (p. 567). Broadberry and Crafts (1996) find a similar relationship between concentration and productivity for 1950, and find evidence that labour productivity growth in the late 1950s and early 1960s was slower in less competitive industries. There is also evidence from the late 1960s and 1970s that exposure to import competition lowered the productivity gap between UK and US firms (Broadberry and Crafts, 2003, Table 6, p. 727).

On the other hand, Broadberry and Crafts (2001) are unable to find strong evidence that concentration was harmful for innovation in a cross-section of British industries in the late 1940s. Their conclusion is that the Schumpeterian and Hicksian mechanisms, which imply that competition reduces and increases innovation respectively, more or less cancelled out during this period. Strikingly, however, they also find a strong positive correlation across industries between innovation and exports. This could imply that competition in export markets was sufficient to drive innovation, as was arguably the case in Imperial Germany; it could however also be that more innovative sectors ended up exporting. The

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<sup>2</sup> Their results are not always statistically significant, however; nor do they include fixed effects in the specification, preferring pooled OLS. Felice and Carreras (2012, pp. 450, 452) argue that Italian relative productivity suffered during the 1930s as a result of "autarky and cartelization", without however giving any evidence in support of the view.

cross-section nature of the data means that there may be many sectoral characteristics that are not being adequately controlled for, a comment that applies to the studies cited in the previous paragraphs also.

These econometric results may not seem secure enough to base a very strong argument on, but Broadberry and Crafts (2003) and Crafts (2012) nevertheless argue that a lack of competition in product markets is an important reason why British productivity growth and economic performance generally was so disappointing between 1945 and the late 1970s, and that an increase in competition was an important factor behind the revival of British economic fortunes in the 1980s. It is certainly the case that some British policy makers at the time believed that there was a link between competition and productivity: according to Urwin (1995, pp. 117-120) one of the main economic reasons underlying Harold Macmillan's famous 1961 decision to apply to join the European Economic Community was the hope that industrial competition with Germany would lead to British industry becoming more efficient.

One potential problem with the argument, however, has to do with industrial market structure in West Germany, a country which was by any standards a success during the period. The traditional view is that World War 2 marked a dramatic break with the past as regards German competition policy: "Only after 1945, under the influence of the victorious powers and neo-liberal teachings, was cartelization banned in West Germany" (Kocka, 1978, p. 564). More recent scholarship has debunked this view. Surveying the evidence, Eichengreen and Ritschl (2009, pp. 210-11) conclude that

An Olsonian structural break in German competition policy after World War II is nowhere in sight.... there is a striking degree of parallelism in competition policy in Britain and in West Germany. Neither country possessed an antitrust culture resembling the Sherman Act. In Britain, nationalization, not competition, was the order of the day. In Germany, Allied decartelization had limited impact on corporate culture. Although there was much talk of privatization and competition, little happened

outside the chemical industry. Privatization of the huge state-owned conglomerates in iron and steel, machinery or auto industry hardly got off the ground until the 1970s, nor did competition policy. In both countries antitrust laws passed in the 1950s left large loopholes that insulated the respective national economies from competition, a condition that changed only in the 1980s in Britain and the 1990s in Germany.

If a lack of product market competition was such a problem in Britain during this period, then what can explain the German *Wirtschaftswunder*? Broadberry and Crafts (2003, p. 729) argue that cartels were more costly in the British context than in the German one: German industry had to face more import competition in an era when UK tariffs were still high, and concentrated German shareholding structures made it easier for shareholders to effectively monitor management. We will see some evidence in favour of this view in a moment. The alternative possibility is that postwar British cartels were not as costly as is sometimes argued.

There is one other consideration that may bear on the relationship between competition and growth during the European Golden Age that has not yet been mentioned. Thus far the discussion has been couched in terms of the incentives for managers to innovate, and whether these were more Schumpeterian or more Hicksian. But during the Golden Age, other factors also mattered for comparative growth experiences. For example, there is a clear, positive cross-country correlation across Europe during 1950-73 between investment and growth, and there are good reasons for thinking that this correlation was causal: countries could grow rapidly by importing best-practice technology from abroad, but this required investment to embody this new technology in machinery and factories. Furthermore, this was an era of financial repression and capital controls, implying that firms relied largely on retained profits to finance investment: between 60 and 80% of investment was financed by retained profits during this period, according to Barry Eichengreen (2007, p. 99).



Eichengreen himself emphasises the fact that this relationship between profits, investment and growth implied a big pay-off to corporatist policies that restrained wage growth. It seems evident, however, that restraints on competition that helped maintain corporate profits at a high level might also have promoted investment and growth in this kind of economic and institutional environment. On the other hand, as Europe gradually converged on the technological frontier and as capital markets deepened, implying that growth was more dependent on innovation at the frontier, and less dependent on corporate profits, this argument for restraining competition would have become correspondingly weaker. Once again, the relationship between competition and growth may have depended on context.

As the late 20<sup>th</sup> century went on, the context seems to have become one in which the benefits of competition increasingly outweighed the costs. There is abundant empirical evidence, largely British, of the positive links between product market competition and innovation from the 1970s onwards. Blundell et al. (1999) explore innovative activity in a panel of 340 manufacturing firms between 1972 and 1982. The message emerging from their results is subtle: firms with higher market share innovate more (and benefit more from innovations), but there is less innovation in less competitive industries. Nickell (1996) uses a panel of British firms between 1972 and 1986, and finds a positive relationship between competition (more competitors or fewer rents) and total factor productivity growth. Nickell et al. (1997) use British firm level data from 1982 and 1994, and find that competition increases total factor productivity growth in firms without a dominant external shareholder, but actually lowers it in a firm with a dominant external shareholder. This finding is consistent with the Broadberry and Crafts view that cartels were more costly in Britain than in Germany during the Golden Age.

Nicoletti and Scarpetta (2003) look at total productivity growth in 23 industries in 18 OECD countries between 1984 and 1998, and find that this is negatively related to entry barriers and product market regulations. Griffith et al. (2010) explore the effects of the pro-competitive Single Market Programme in a sample

of 12 two-digit manufacturing industries in nine countries between 1987 and 2000. They find that this policy shift led to increased competition, more investment in R&D, and faster total factor productivity growth. Aghion et al. (2009) find that greenfield foreign firm entry into the British market between 1987 and 1993 raised patenting activity and productivity growth in technologically advanced incumbent firms, but not in laggard firms. Buccirossi et al. (2012) find a positive relationship between competition and total factor productivity growth in a sample of 22 industries in 12 OECD countries between 1995 and 2005.

In summary, over the past few decades it seems that the link between competition and productivity growth has become positive. There are at least two ways of thinking about why this might have been the case. The first, already alluded to, is theoretical:

...threat from frontier entrants induces incumbents in sectors that are initially close to the technology frontier to innovate more, and this triggers productivity growth, but entry threat reduces the expected rents from doing R&D for incumbents in sectors further from the frontier. In the former case, incumbent firms close to the frontier know that they can escape and survive entry by innovating successfully, and so they react with more intensive innovation activities aimed at escaping the threat. In the latter case, incumbents further behind the frontier have no hope to win against an entrant (Aghion et al., 2009, p. 20).

In this view once you have converged to the frontier, the more competition the better, in perpetuity.

The second is technological: product market regulations may be more costly in the ICT era, since they may hamper the diffusion of this new general purpose technology (Conway et al., 2006). In this case, the positive relationship between competition and technological diffusion is a central characteristic of the present-day era, and may be a reason why Europe has not exploited ICT as effectively as

the USA, especially in the distribution sector. On the other hand, there is no guarantee that what is true in today's technological environment will be true forever, since the dominant technologies of the future remain unknown.

Whether the positive correlation between competition and productivity change is a "new normal" or a feature specific to the ICT revolution is something that only time will tell. At the same time, it should be remembered that in smaller countries, trade is the best competition policy. It is therefore to the impact of trade on growth that I now turn.

### **3. Trade policy**

If there is one thing that most economists can agree on, it is that free trade is a good thing. And yet economic theory is ambiguous on the subject. Rodrik (2005, pp. 985-6) provides a standard list of caveats (second best problems, problems relating to terms of trade effects, problems relating to undesirable effects on income distribution, and so on), but even this understates the degree of theoretical ambiguity since these are all issues relating to the standard static argument for free trade. Once you start to explore the growth effects of free trade, a plethora of theoretical possibilities emerge (Grossman and Helpman, 1991):

The general answer to the question "Does trade promote innovation in a small open economy?" is "It depends." In particular, the answer depends on whether the forces of comparative advantage push the economy's resources in the direction of activities that generate long-run growth (via externalities in research and development, expanding product variety, upgrading product quality, and so on) or divert them from such activities (Rodríguez and Rodrik, 2000, pp. 268-9).

Theoretical ambiguity does not necessarily imply that the empirical record will be ambiguous as well, and for a while it was widely assumed that, empirically, trade openness and growth went hand in hand. A key contribution to the

quantitative literature was Sachs and Warner (1995), who produced an index of what they called “trade openness”, and studied the relationship between this index, on the one hand, and growth between 1970 and 1989 on the other. Two central findings emerged from their study. The first was that trade openness was associated with higher growth; the second is that income convergence was a feature of the growth experiences of those countries which had been open to trade, but not of those countries which had been closed. A subsequent study by Wacziarg and Welch (2008) updated the Sachs-Warner openness index, and found that while the cross-sectional relationship between openness and growth was positive in the 1980s, it was less so in the 1970s, and not present at all in the 1990s. On the other hand, focusing on policy transitions, they also found that between 1950 and 1998, countries that liberalized their trade regimes saw their growth rates increase by an average of 1.5 percentage points per annum; interestingly, the effect was stronger rather than weaker during the 1990s.

However, the Sachs-Warner “trade openness” index has been subjected to substantial criticisms, notable by Rodríguez and Rodrik (2000). Sachs and Warner (p. 22) characterized a country’s trade policy as closed if at least one of the following was true: non-tariff barriers covering more than 40% of trade; average tariffs of 40% or more; a black market exchange rate depreciated on average by 20% or more relative to the official exchange rate during the 1970s and 1980s; a socialist economic system; a state monopoly on major exports. Rodríguez and Rodrik point out that the black market premium and export monopoly variables are the ones that really drive the Sachs-Warner results, and that the latter is practically equivalent to an Africa dummy variable, in the context of cross-section regressions run on late 20<sup>th</sup> century data. Similarly, black market premia reflect “a wide range of policy failures” (p. 289), rather than trade policy per se. Subsequent researchers, such as Buera et al. (2011) and Hausmann et al. (2005), have thus used the index as a measure of the general market-friendliness of a country’s economic policies, rather than as an index of trade policy per se.<sup>3</sup>

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<sup>3</sup> Hausmann et al. (2005) use the index to ask whether market-friendly economic reforms are associated with growth accelerations between the 1950s and 1990s.

Against this backdrop, cliometric research on the subject has tended to be characterised by two key features. First, rather than use dummy variables to measure trade policy, quantitative economic historians have tended to look at the impact of import tariffs on growth. Weighted average tariffs are fairly easy to compute, being simply the ratio of customs revenues to the value of imports; and the further back in time you go, the less important were other forms of protection, such as quantitative restrictions and exchange controls.<sup>4</sup> Second, economic historians have often (but not always) used panel methods, by looking at growth rates over five or ten year periods. The obvious risk with such a strategy is that you may be picking up cyclical rather than long run growth effects; the obvious benefit is that it allows for fixed effects estimation.

By and large, cliometric work has provided support for Rodríguez and Rodrik's (2000, p. 266) skepticism that "there is a general, unambiguous relationship between trade openness and growth waiting to be discovered," and their suspicion that "the relationship is a contingent one, dependent on a host of country and external characteristics." For example, Clemens and Williamson (2004) find that the correlation between tariffs and growth was positive during the interwar years, which fact they attribute to the demand-deficient and tariff-ridden environment of the time: export markets were in any case not open, and the opportunity cost of protecting one's domestic market, and thus protecting local jobs, was consequently lower. Additionally, tariffs may have helped combat the deflationary environment of the time.

Turning to the late 19<sup>th</sup> century, O'Rourke (2000) explored the relationship between average tariffs and growth in a sample of ten relatively well-developed economies between 1875 and 1914 (Australia, Canada, Denmark, France,

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They find a statistically significant relationship between the two, but the relationship is not particularly reliable. Most pro-market reforms do not lead to such accelerations, and most accelerations are not preceded by such reforms.

<sup>4</sup> Weighted average tariffs are subject to a well-known index number problem (Anderson and Neary, 2005), but it would be impossible to construct trade restrictiveness indices for historical panels of countries.

Germany, Italy, Norway, Sweden, the United Kingdom, and the United States). He found that the relationship was positive rather than negative, in a number of different specifications, indicating that protectionism was associated with higher growth rates rather than with lower ones. This was consistent with the qualitative argument that had been made earlier by Paul Bairoch (1989). The results were robust to the inclusion of country fixed effects, which is important given the argument in Irwin (2002) that the positive correlation between tariffs and growth was due to the fact that land-abundant New World countries with high growth potential largely relied on tariffs to finance their governments. If that were the case, including fixed effects should have eliminated the positive correlation between tariffs and growth, whereas doing so actually increased it. O'Rourke's finding was subsequently confirmed by Jacks (2006), who used a different sample of countries and alternative measures of trade barriers. More recently, however, Schularick and Solomou (2011) performed a similar analysis using more sophisticated econometric techniques, and argued strongly that there is no relationship between tariffs and growth, either way, once period fixed effects have been included in the specification.<sup>5</sup>

This literature, and much of the literature on trade and growth in the 20<sup>th</sup> century as well, largely misses the point however. Economic theory tells us that what you protect is what really matters, and yet most studies look at the effects of protectionism "on average", as if a tariff on tea would have the same impact as a tariff on pig iron or cotton textiles. In the context of the late 19<sup>th</sup> century, and much of the 20<sup>th</sup> century as well (depending on the country) a key distinction was between tariffs on agricultural and on industrial products. There are lots of reasons to suspect that a shift towards industry might have been good for growth during this period, and possibly later as well. First, labour was more productive in industry than in agriculture, and structural change which shifted labour out of the countryside and into industrial cities should therefore have

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<sup>5</sup> O'Rourke (2000) had noted that the relationship between tariffs and growth became statistically insignificant once time as well as country fixed effects had been included in the analysis, but suggested that this was because there was little variation left in the data once both sets of dummies had been included: the R-squared of a regression of tariffs on country and time dummies was 0.879.

been a source of growth during the 19<sup>th</sup> and 20<sup>th</sup> centuries. Indeed, empirical work suggests that this was the case (Broadberry, 1997a; Broadberry, 1998; Temin, 2002). Second, there is a long theoretical and historical tradition which argues that industry involved various growth-promoting externalities that agriculture did not, and that countries which specialised in agriculture as a result of opening themselves to free trade might reap static gains but dynamic losses (Matsuyama, 1992; Williamson, 2006). For both of these reasons, it makes sense to see if there were different effects on growth of different types of tariffs. Lehmann and O'Rourke (2010) find that there is a positive correlation between manufacturing tariffs and growth for the same sample of countries in the late 19<sup>th</sup> century, but that the correlation between agricultural tariffs and growth was generally negative (albeit statistically insignificant). Moreover, there was no relationship at all between revenue tariffs and growth. Furthermore, these correlations are robust to the inclusion of a variety of control variables, and both country and time dummies. The supposedly growth-promoting externalities associated with industry would seem to offer one such explanation for this finding: as is well known, the United States industrialized behind very high tariff barriers during this period, and Germany and other continental European countries similarly protected their heavy industry. But even if the argument is correct, it does not follow that such policies would have worked in even less developed countries at the same time, or in the same countries in later periods. There is thus an important potential role for country histories in elucidating the impact of economic policies on growth, since panel growth regressions picking up average correlations may at times conceal as much as they reveal.

Turning to the late 20<sup>th</sup> century, it seems clear that *exporting* has been positively related to growth in many countries. Moreover, though there is clearly two-way causality at work here, it is also clear that the export-oriented economies of Korea and Taiwan did much better than the inward-oriented economies of Latin America or sub-Saharan Africa. The difference does not lie in barriers to imports, since both groups of countries were highly protectionist; the difference lies rather in the reliance of East Asian manufacturers on exports rather than domestic markets. This provided them with international benchmarks to keep

them competitive, with more than a little help from government subsidies, protected domestic markets, and undervalued currencies. As in the case of Imperial Germany, highly organised and protected domestic markets combined with competition on export markets to produce exceptionally successful economies. If open trade policy contributed to success in these countries, it was America's.

More recently (since 1990 or so), openness has clearly been positively related to growth in many developing countries, with foreign direct investment and technology transfer being the key channels linking the two. Baldwin (2011) argues convincingly that what he calls the "second unbundling" has made it much easier for developing countries to industrialize, and that the Korean or Taiwanese route to industrial development involving the encouragement of national champions using protected domestic markets as a launchpad from which to conquer foreign markets is no longer necessary. Countries can now simply slot into the global supply chains of large multinational companies. If this is so, and if this phase of globalization is sustained, then this will have profound implications for both developing and developed economies, as well as for how we think about the links between trade, competition, and economic development.

#### **4. Conclusion**

The big message of this paper is that the impact of both trade and competition policy on economic growth is context-specific: it has varied across both countries and time periods. A comparison of the United States and European Union today suggests that competition matters more in the IT era than it did previously, and that if Europe wants to resume its productivity catch-up on the United States that stalled in the 1990s, speeding up the diffusion of IT will be key (Crafts and O'Rourke, 2014). Greater competition seems clearly to be a means to this end, especially in the distribution sector, although whether competition will remain as beneficial in the future remains to be seen.



On the other hand, another crucial difference between the US and Eurozone since 2008 has been the quality of macroeconomic policy making, with the Eurozone depression attaining 1930s levels in several member states as a result. The first best solution to this problem is more expansionary monetary and fiscal policy, but given the political obstacles to this some policy makers may be tempted to ignore the fact that the Eurozone's current problems are mostly on the demand side, and focus on possible supply side remedies instead.

Both history and theory caution against using structural reforms as a tool against depression. Deflation and deflationary expectations were at the heart of the Great Depression, and governments often encouraged cartels to help provide a floor to prices; for example, Roosevelt's National Industrial Recovery Act suspended anti-trust laws. While Keynes himself disapproved of the NIRA, and while the NIRA has been widely reviled subsequently, Eggertsson (2012) argues that these views ignore the crucial role which deflationary expectations played during the crisis. By providing a floor to prices, NIRA helped to reverse these deflationary expectations, and as many authors have argued (Temin, 1989; Romer, 1992) this reversal was crucial for the recovery. In a somewhat similar vein Broadberry and Crafts (1990) argue that price-fixing agreements as well as tariffs were beneficial in 1930s Britain, since they helped raise prices relative to wages and thus lowered unemployment. The problem was, in their view, that these policies stored up long run productivity problems for the future, in which case they should have been reversed much earlier.

If anti-competitive policies can be beneficial in a slump, then it logically follows that pro-competitive policies can be harmful. Eggertsson et al. (2014) argue that in the context of a demand-constrained economy facing the zero lower bound, structural reforms, including labour and product market reforms, could make things worse for the Eurozone at this point in time, not better. Keynes famously wrote that "The boom, not the slump, is the time for austerity", and despite his views on NIRA, the same is true for competition policy as well.

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