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Enterprise and management

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INTRODUCTION

The argument that defects in the performance of the British economy can be best explained by lacklustre enterprise and management and a general weakness of the industrial spirit has a long history. Assertions of entrepreneurial failure remain both seductive and appealing, particularly for those who favour cultural explanations. However, in their celebrated 1971 essay on late Victorian business performance Donald McCloskey and Lars Sandberg countered this conventional wisdom. On the basis of the neoclassical conceptual and empirical literature, they found limited evidence for significant and economically relevant instances of failure.

Not all theoretical advances have favoured British entrepreneurs. Institutional approaches reinforce the perspective that entrepreneurs need to be judged against their operating environment. Entrepreneurs interact with institutions, which can both reduce transaction costs and facilitate benefits from exchange, or act as a brake on economic development if 'institutional rigidities' are present. Advocates of this approach claim that competing industrial nations displaced Britain from economic

pre-eminence by performing better in respect of labour relations, education, industrial organisation, corporate finance and government policy towards enterprise. Thus, institutional writers have challenged the argument of entrepreneurial redemption deeply rooted in the neoclassical analysis of business behaviour.

Cultural approaches to entrepreneurship broadly agree with this challenge; they explain performance differences between countries by reference to a capacity for enterprise and initiative. In Britain, it is claimed, a rigid social structure and the persistence of gentlemanly capitalism eroded the industrial spirit. Advocates of conventional cultural approaches hail 'the limits of economic explanation' (Wiener 1981: 167). Scholars writing historically on culture have been reluctant to use formal methods or economic theory as analysis tools, preferring casual empiricism as a framework for explanation. In a departure from this conventional method, new approaches use quantitative and conceptual methods to add weight to the viewpoint that culture is a critical determinant of economic behaviour and performance.

This survey proceeds in four stages. The second section describes Britain's economic growth record. The third, fourth and fifth sections discuss neoclassical, institutional and cultural analyses of entrepreneurship as research programmes. These approaches are neither entirely discrete nor confined to specific areas of enquiry. However, delimiting the literature in this way is a useful navigational device, and facilitates the integration of new methods of analysis that build on older vintages of research. Much has been written since the publication of McCloskey and Sandberg's seminal essay, but the emphasis here is on the most recent contributions. Promising avenues of enquiry are highlighted. The main argument is that advances in economic theory offer an improved framework for both macro- and micro-level investigations. Endogenous theories of growth lead to a clearer understanding of international differences in entrepreneurial performance. The evolving literature on the dynamics of technological change elaborates on the neoclassical analysis of constrained optimisation and rational technology choices. Research on institutions highlights the broader economic environment in which entrepreneurs operate. Conceptual and empirical examinations of culture lead away from an unproductive emphasis on casual empiricism. These new approaches, among the others discussed in this essay, enhance our understanding of British entrepreneurial history.

UNDERSTANDING THE GROWTH RECORD

Researchers in the field of growth accounting have confronted difficult measurement problems in establishing informative data on the relative performance of countries in the late nineteenth and early twentieth

centuries. Proponents of the entrepreneurial failure hypothesis point to historic indices that emphasise the weakness of the British economy. These data are summarised in Tables 1.1 to 1.7. In 1870 British GDP growth stood at approximately 2.4 per cent per annum, but had slowed to 1.4 per cent per annum by 1913 (Table 1.3). In 1900 Britain still had the highest level of gross domestic product (GDP) per person, but the United States and Germany experienced higher rates of *growth* (Crafts 1999: 19–20). There is nothing in the output series to suggest a break in trend, or ‘climacteric’ (such as was alleged by some earlier writers); however, unlike competing industrial nations, Britain failed to achieve ‘trend acceleration’ (Greasley and Oxley 1995; Crafts and Mills 1996b). American GDP per person increased from 75.3 per cent to 131.4 per cent of the British level between 1870 and 1929. Germany also established a large lead over Britain during this period (Crafts 1998: 200, 1999: 20).

Which aspects of decline were to be expected, and which aspects were attributable to the actions of entrepreneurs, is one of the overarching issues in this debate. Contemporary commentators argued that Britain’s international economic displacement was indicative of entrepreneurial failure (Shadwell 1909). Cases of weak entrepreneurship were identified in the traditional staple industries – steel, coal and textiles – as well as in some of the newer industries – chemicals, motor cars and electrical engineering (Clapham 1938). Economic history research in the 1950s and 1960s concurred with this view. In 1964 Aldcroft levelled a multi-pronged attack on the British entrepreneur who, among other things, did not invest sufficiently in research and development (R&D), was reluctant to adopt best-practice high-throughput innovations, and was slow to embrace the newer technologically dynamic industries of the second industrial revolution. More sanguine views took it to be expected that the newer industrialising nations would leapfrog Britain, given their natural resources and market conditions. Yet entrepreneurs did not escape blame. According to Marshall although ‘it was inevitable that [Britain] should cede much . . . it was not inevitable that she should lose so much of it as she has done’ (Marshall 1920: 298).

Contemporaries warned that too much capital was being sent abroad for the good of the British economy, reducing the supply of entrepreneurial investment funds at home. The rate of savings in late nineteenth- and early twentieth-century Britain was similar to the rising industrial nations of Germany and the United States, yet domestic investment in Britain was almost half the level of these countries. However, analysis of the risks and returns associated with domestic and overseas investment shows that investors were acting rationally by channelling funds abroad where higher returns were available to augment British national income (Edelstein 1982). According to Clemens and Williamson (2001) British capital was attracted overseas by fundamentals – human capital, natural resources and demography – which made the New World an

attractive investment opportunity. With a diminishing marginal product of capital a substantial diversion of funds from foreign projects to new home investment would have lowered returns domestically. In addition, the marginal efficiency of capital will be lower the greater the amount of capital already possessed. As McCloskey (1979: 539) famously quipped, late Victorian Britain did not need 'two Forth Bridges, two Bakerloo Lines, two London housing stocks, two Port Sunlights'.

McCloskey (1970) used a neoclassical model of exogenous growth to attempt to show that the late Victorian entrepreneur did not fail; rather he was doing the best he could with available resources according to the economy's resource endowments and prevailing technology. First, McCloskey tackled concerns that a slowdown in Britain's late Victorian economic growth was due to an inefficient allocation of resources. The basic ingredient of his model is an aggregate production function with constant returns to labour, and diminishing returns to the accumulation of capital. With a constant level of labour supply, and a given state of technological knowledge, how much output is produced by an economy then depends on the aggregate level of the capital stock. McCloskey calculates that the economy could have only grown at a more rapid rate if capital and labour were substitutable and if capital growth had been substantially higher. Both of these factors were improbable, and in any case, would not have sustained a permanently higher rate of *long-run* growth. Had Britain saved more, or reversed its decision to send capital abroad during this period, more investment at home would have driven the marginal product of capital close to zero unless technology had changed for other reasons. To the extent that entrepreneurs were choosing the most efficient technologies, and that competition was eradicating uneconomical practices, the British economy was 'growing as rapidly as permitted by the growth of its resources and the effective exploitation of the available technology' (McCloskey and Sandberg 1971: 459).

The notion that entrepreneurs were optimising, subject to constraints beyond their control, receives support from research which seeks to explain differences in the adoption of technology and in comparative growth rates between Britain and America. Habakkuk (1962) maintained that in Britain labour was cheaper than capital, which meant that entrepreneurs naturally persisted with labour- rather than capital-intensive methods of production. In America, by contrast, scarcity of labour encouraged the widespread use of capital and mass-production methods to meet the demands of a larger market. David (1975) reformulated this thesis to stress the evolutionary properties of technological change, whereby the initial, often random, choice of technology sets in motion a process of cumulative learning and expansion. Rosenberg (1982) pointed out that, in America, specialisation and hence larger firms were facilitated by the simultaneous growth of several industries sharing certain technical

processes. A few firms, each reaping considerable economies of scale, could then satisfy demand.

British entrepreneurs may be further exonerated by branches of the new growth literature (e.g., Aghion and Howitt 1998). Although the forces of endogenous growth are difficult to identify, induced-technological change, as opposed to exogenous technology in traditional neoclassical growth economics, occupies a central role in Crafts' (1998) explanation of late Victorian comparative economic performance. While resource endowment, market size and institutional constraints fettered the British economy, competing nations offered a more favourable platform for endogenous innovation and learning. Because of the different environments in which entrepreneurs operated there were fewer opportunities for international technology spillovers, such as the transfer to Britain of American mass-production techniques. Since British entrepreneurs could do nothing about the hand they were dealt by history, 'the developments in endogenous growth theory may offer additional lines of defence for those wishing to absolve British business of any failure' (Crafts 1998: 206).

The issue of absolution may also be approached from Broadberry's (1997c, 1998) perspective of sectoral productivity rates (see also chapter 3 above). His research questioned whether a weak performance in manufacturing was really at the heart of Britain's economic faltering. Productivity statistics have traditionally reinforced pessimistic assessments regarding British long-run economic development (aggregate British productivity growth advanced at 0.45 per cent per annum between 1873 and 1913, slowing to just 0.05 per cent per annum over the period 1899–1913). However, Broadberry's data reveal that the British experience when set against the United States and Germany was different when analysed sector by sector. In fact, differences between Britain and these benchmark nations arose not so much through performance in manufacturing, as by Britain's comparative loss of labour productivity in services (see Table 1.2).

Explaining why labour productivity in services – transport and communications, distribution, finance, personal and professional services and government – was so high in the late nineteenth century, but relatively low by the end of the twentieth, is problematic because the literature on enterprise and management structure during this period is unduly centred on manufacturing. Although services have not been neglected entirely 'the full explanation of these trends will require [more] detailed investigation at the level of individual service sectors' (Broadberry 1998: 393). Thus, business histories of retailing enterprise document the pioneering role of British firms in product development, branding, distribution, industrial relations and multinational expansion (e.g. Chapman 1984; Fitzgerald 1995), but there are no micro-level comparative studies which may explain the reasons for cross-country productivity differentials. It is often claimed that the social cohesion of the British banking

elite epitomised Britain's cultural shortcomings, but it may also have had a positive effect on productivity though enhancing network effects and facilitating informal 'relational contracts' within and between firms. The performance of the service sector is one of the least understood aspects of Britain's comparative economic decline.

NEOCLASSICAL *HOMO ECONOMICUS*, TECHNOLOGY AND PATH DEPENDENCE

Against this backdrop of debate over the growth record, economic historians continue to debate whether Britain's sluggish late nineteenth-century growth performance was due to a slowdown in the rate of technological progress. Britain's comparative advantage during the nineteenth and early twentieth centuries rested in the traditional staple industries (Crafts 1998: 201). Competing nations were stronger in the newer industries, and often made technology choices that did not prevail in Britain. Micro-level research has tried to uncover the causes and consequences of Britain's differential industrial structure and methods of production.

Endogenous growth theorists place innovation at the heart of economic development. Productivity growth derives from the rapid replacement of obsolete knowledge by new discoveries. This process, analogous to Schumpeter's notion of 'creative destruction', is stimulated by incentive structures that facilitate the development of new technologies. Advocates of endogenous growth theory argue that they can develop more flexible models, which embrace a truer vision of economic activity. Unlike the preceding neoclassical paradigm their theory does not assume that technology is universally available at no cost, nor treat entrepreneurs as operating within the constraints of existing technological possibilities.

Scholars of the industrial revolution, however, point out that Britain's mid-nineteenth-century success came from a capacity to create and diffuse new technologies which might be best regarded as exogenous 'macro-inventions' (Mokyr 1990) rather than the continuous technological change implied by such theories. Indeed O'Brien *et al.* (1996) doubted whether endogenous theories can be applied to leading technological innovations of this period, especially those in cotton textiles. Micro-research on British industries has illustrated the power of the neoclassical paradigm to explain technology choices in leading industries for later epochs. Case studies of the adoption of late Victorian technology consider whether entrepreneurs were making economically rational choices; this is a natural starting point from the rational choice perspective, which argues that entrepreneurs do not generally ignore opportunities for profit.

Most research of this type has been devoted to explaining technology choice in the cotton textile industry. The crux of the issue is whether Lancashire entrepreneurs were rational in their decision to install mule

spindles at a time when New England entrepreneurs were switching to a newer technology – ring spinning. In the US ring spindles comprised 62 per cent of all spindles by 1890 and 87 per cent by 1913. In Britain, by contrast, only 19 per cent of all spindles were ring spindles on the eve of the First World War. In a pioneering article, Sandberg (1969) argued that demand and factor costs explain the Lancashire decision to persist with mules, rather than a reluctance to embrace new technology. Leunig's (2001) re-examination of Sandberg's classic argument confirmed that demand- rather than supply-side constraints were the dominant force reducing ring spinning adoption rates. This research challenges the view that mule spindles were a necessary response to the industry's inefficient organisation into vertically specialised units which increased transport costs between spinning and weaving facilities (Lazonick 1981b). It suggests that production of high-quality goods supported by a large export trade determined Lancashire's predisposition towards mules.

According to Saxonhouse and Wright (1984) the cotton technology debate ignores the most salient characteristic of the industry during this period – new competition. They sided with the view that Lancashire's reliance on the mule compared with ring spinning was the outcome of a decentralised vertically disintegrated industrial structure which was inimical to technological change. However, they also maintained that a switch to rings would not have given rise to a favourable outcome for the industry. Protectionism and economic development in low-wage countries, combined with a high British wage rate, caused decline. During the late nineteenth and early twentieth centuries Britain was not well placed to be the leading cotton economy.

There are conflicting interpretations of whether domestic supply and demand conditions were equally significant in other sectors of the economy. The British iron and steel industry faced slower-growing demand than its major industrial competitors during the late nineteenth and early twentieth centuries. Differences in demand, according to Temin's (1966) calculations, gave German and American producers a 15 per cent productivity advantage over their British counterparts. Taking account of measurement error, McCloskey's (1973) revisions to these estimates reduces the gap from 15 per cent to 1 per cent, thus questioning the extent to which demand was a source of decline in this industry. None the less, for McCloskey, Britain's late nineteenth-century iron and steel industry should be considered as a case study of economic maturity rather than entrepreneurial deficiency. In 1890 British productivity in iron and steel was at least equal to the American rate. Assertions that the industry did not take advantage of ores in East Midlands districts – a cost-reducing metallic input – are rejected by McCloskey in favour of the argument that entrepreneurs were rational to concentrate on existing areas of production in the north-east. At a time when transport costs were high, East Midland ores were too distant from product and factor markets to be

viable. Entrepreneurs were optimising subject to geological and transport cost constraints.

Allen's (1977, 1979) comprehensive analysis of Britain's relative decline as an iron and steel exporter in the late nineteenth century broadly concurred with the view that geological and transport cost constraints were significant, but suggests that 'vigorous entrepreneurs could have overcome . . . these disadvantages'. Germany and America surpassed Britain in productivity because of lower-cost raw materials and superior technical efficiency; American and German producers were approximately 15 per cent more efficient than British producers between 1907 and 1909. Although lower-cost production was hindered by a high British wage rate more investment in integrated plants producing basic steel from north-east ores could have driven costs at least as low as German levels. Without systematic investment in high-efficiency plants, British producers could not (and did not) match the prices of their German counterparts.

Lindert and Trace (1971) found evidence for entrepreneurial-induced decline in the history of the chemicals industry. Their research showed that British dyestuff firms could have secured higher profits by switching from the Leblanc system of alkali production to the superior Solvay production process which was utilised by German and American firms. The Solvay system was patented in 1861, yet by 1894 65 per cent of soda output in Britain still came from the Leblanc method; for competing producers the share was no more than 22 per cent. British firms should be indicted for not taking advantage of the new knowledge, which chemical engineers had predicted would revolutionise the industry. Rather than adopting new and more efficient technologies, manufacturers responded by merging into the United Alkali Company in 1890 in order to protect existing streams of rent. The chemicals industry is used as evidence in the broader debate on the reluctance of British entrepreneurs to take hold of the new innovations associated with the second industrial revolution (Mokyr 1990: 266).

A variety of other industries have been used as case studies to test the hypothesis of entrepreneurial rationality in the late nineteenth and early twentieth centuries (McCloskey 1971). One of the main contributions of this work has been the application of economic theory to a previously qualitative debate. The study of entrepreneurial activity has been transformed from a research programme characterised by arbitrary performance judgements to one in which measurable variables are analysed within a theoretical framework. However, critics have argued that the assumption of rational choice which underlies neoclassical investigations is not well suited to the analysis of entrepreneurial behaviour. Entrepreneurs have no capacity for seizing opportunity or taking strategic action within the neoclassical assumptions of objectivity of information, autonomy of preferences and cost-less optimisation. The case studies discussed above show that this criticism is misplaced. The neoclassical

approach is substantive and facilitates empirical tests to determine whether entrepreneurial actions are economically optimal. Rationality is the benchmark against which both success and failure can be judged.

However, alternative frameworks can enhance our understanding. Static neoclassical analysis cannot fully explain the dynamics of technological change and its evolution. The theory of 'path dependence', which provides a conceptual framework for explaining why the economy can be locked in to a specific technology because of technical interrelatedness, scale economies, learning and habituation, has been used to glean fresh insights into British industrial organisation and business performance. In a recent debate Van Fleck (1999) and Scott (1999) used the evolving literature on path dependence to address the oft-cited Veblen-Kindleberger hypothesis that older vintages of industrial equipment placed a burden on the efficiency of railways. Van Fleck's central argument is that the British system of utilising small coal wagons was an efficient method of distributing coal to local markets when compared with road transportation. Larger wagons would not have yielded substantial operating cost savings – 'the little coal wagon was exactly the right type of technology to employ'. Scott, on the other hand, calculates that economies foregone were considerable and that the initial choice of small privately owned coal wagons proved to be a significant constraint on the efficiency of coal distribution by rail. The high costs tied up in existing rolling stock and infrastructure prevented reorganisation of the industry to take advantage of larger cost-minimising wagons under a system of common ownership.

According to the path dependence literature every technology has a history, and the evolution of a technology can depend critically on its own past (Arthur 1989; Liebowitz and Margolis 1995; David 1997). In the case of the British rail industry (and from Scott's perspective) investment in best-practice larger wagon technology was blocked by complementarities between smaller wagons and the industry's infrastructure. Fragmented ownership of the railways and rolling stock created and, through feedbacks, reinforced these 'network effects'. Under a changed set of investment circumstances a different cost-minimising technology – larger wagons – might have been forthcoming. Counterfactual worlds can be contemplated; path dependence is consistent with a multiplicity of equilibria. From Van Fleck's perspective, the historical evolution of rail wagon technology was due to initially efficient entrepreneurial decision making. The small wagon distribution system was cost-effective and exhibited increasing returns to owners. Although Van Fleck has less to say on whether this level of lock-in gave rise to sub-optimality, the literature on path dependence does entertain this possibility. How historical events exert an influence upon subsequent outcomes is just one side of the debate. Whether historical accidents give rise to inferior equilibria is perhaps the more salient other side.

INSTITUTIONS AND BRITISH SCLEROSIS

One of the recurrent criticisms of the highly stylised view of entrepreneurial behaviour which is embodied in the neoclassical approach is that it is of only limited use in explaining the significance of institutions. Institutions surely have to play a part within explanations of long-run growth and development. By reducing transaction costs and facilitating potential gains from exchange, institutions can be a significant source of productivity growth (North 1989; Acemoglu *et al.* 2001). Pointing to a fusion of institutional constraints that undermined British economic competitiveness, Elbaum and Lazonick (1984) put forward a challenge to the neoclassical paradigm of constrained optimisation. Drawing together case studies of leading industries, Elbaum and Lazonick concluded that a common factor – ‘institutional rigidity’ – explains why entrepreneurs were slow to adapt to international competition during the early twentieth century. British entrepreneurs failed to unlock pre-existing paths of development and this limited the capacity of the economy to respond to a new economic environment. British businessmen did not challenge institutional constraints and therefore were responsible for the country’s comparative economic failure. This research was buttressed by Olson’s (1982) notion of ‘institutional sclerosis’, which refers to the economic and social constraints that hold back the modernisation of industry. Britain did not experience the institutional destruction and replacement of self-interested elites that occurred in several European nations. Interest groups colluded to protect their privileged positions, contributing to Britain’s economic plight.

Yet to a large extent the interaction of entrepreneurs with institutions is driven by government policy. Baumol (1988, 1990) postulated a link between productive and unproductive entrepreneurship and the structure of payoffs in the economy. According to his theory policy makers are more able to influence the allocation than the supply of entrepreneurship. For example, revisions to the patent laws during the nineteenth century are said to have reduced opportunities for undue appropriation by affording inventors legal protection of their intellectual property rights (Dutton 1984). Company law, on the other hand, may have worked in the opposite direction. Poor information on the stock exchange precluded would-be predators from obtaining knowledge about target enterprises. It was not until 1948 that firms were forced to disclose systematic information concerning their assets and profits. Although American company law was also lax before the formation of the Securities and Exchange Commission in 1934, independent investor services like Moody’s and Standard and Poor’s provided an antidote to problems of asymmetric information. Lax information disclosure in Britain created opportunities for corruption and malpractice. Over 30 per cent of companies formed between 1856

and 1883 ended in insolvency (Jobert and Moss 1990). It is perhaps no accident that the careers of the unscrupulous company promoters appear frequently in nineteenth- and twentieth-century British entrepreneurial history (Armstrong 1990).

In an attempt to explain the significance of institutions and policy making, revisions to the neoclassical paradigm incorporate more flexible assumptions that allow market imperfections and transaction costs to be determinants of entrepreneurial performance. Theories building on the basic conceptual premise of the neoclassical *homo economicus* have established a more informative predictive theory of entrepreneurship. Bowles and Gintis (1993: 84) have commented that the entrepreneur is 'not satisfied with calculating marginal substitutions while shopping for groceries, [H]e now optimises while deciding how hard to work for his employer, how truthfully to transmit information to his exchange partners and whether the costs exceed the benefits of defaulting on a loan.'

Advances in economic theory have also been used to address the recurrent argument that British entrepreneurs were starved of investment funds as a consequence of imperfections in capital markets. If banks allocate credit according to information on prospective borrowers, informational asymmetries can lead to potentially successful entrepreneurs being denied credit. Liquidity constraints can either exclude individuals with insufficient funds at their disposal from entrepreneurship or prevent those who do enter into entrepreneurship from exploiting the opportunities available. If would-be entrepreneurs cannot borrow on the credit market, or find the cost of capital too high, they may continue in wage work or start an enterprise with a lower level of capital.

Individual case studies of credit rationed entrepreneurs are not sufficient to confirm or reject the hypothesis that capital markets constrained the supply of entrepreneurship. Even the most successful entrepreneurs face problems in accessing capital (Mokyr 1990: 262). Capie and Collins (1996) approached the issue by assembling comprehensive data on lending practices from commercial bank archives. In a study of 453 separate cases of banks refusing to lend to industrial clients, they showed that the decision not to invest was motivated by the desire instead to fund long-standing clients on whom more information was available, which were in competition with risky new investments with highly uncertain outcomes. Although 'the yardstick on adequacy of capital was a severe one when applied to new firms and it seems to have severely hindered their chances of raising bank loans' (1996: 43), this was a natural response to the problems of adverse selection and moral hazard. Contrary to common perceptions, British banks did provide long-term loans to industrial clients in addition to their role as suppliers of short-term credit and working capital (Collins and Baker 1999).

However, we do not know from the Capie–Collins study whether German and American banks treated their clients differently. The central

issue about British banking and economic growth is whether or not the system could support sustained economic development following the industrial revolution, and this can be best understood from a comparative perspective. It is commonly argued that British commercial banks were reluctant to develop close relations with industry between 1870 and 1914, in contrast to Germany where formal ties between banks and firms mitigated agency costs and enhanced corporate governance practices. (Gerschenkron 1962; Kennedy 1987). The view that banker influence on a firm's supervisory board was beneficial is also supported from studies of the United States (e.g. De Long 1991). In addition to facilitating access to investment finance adding liquidity, monitoring debt and providing signals to investors, formal bank relationships with firms made possible the rapid replacement of bad managers. In Britain, where such relationships were much less common, bad managers may have been more likely to survive.

On the other hand, such generalisations may be unwarranted. Several studies (Edwards and Ogilvie 1996; Collins 1998; Fohlin 1999) have questioned the alleged inefficiency of British banking in a European context. Taken together, this work suggests that a much smaller weight should be placed on comparative banking systems in accounts of Britain's relative economic decline. Guinnane's (2002) analysis provided a properly stratified account of the benefits and costs of Germany's banking system in relation to growth. Germany's universal banks were able to 'foster and support firms at an earlier stage and more effectively than could other types of banking institutions' (2002: 119), but they also created problems by restricting competition in banking and fostering cartel arrangements in industry. Moreover, universal banks may have played a more limited role than conventionally thought in providing start-up capital for entrepreneurship (Kleeberg 1988). To the extent that smaller private banks were more effective as institutions for venture capital finance, some scholars may have overstated the contribution of universal banking to German economic growth.

British and American industrial relations in the early twentieth century have frequently been subjected to cross-cultural analysis. For example, Lazonick (1994) pointed to employment relations in manufacturing as a source of entrepreneurial failings. Such studies argue that British manufacturers, unlike their American counterparts, faced industrial relations scenarios which inhibited the introduction of advanced production methods. This was symbolised by the reluctance of British manufacturers to invest in the American system of mass-production. The exemplar case is the motor vehicle industry. The strength of organised labour in Britain impeded the introduction of Henry Ford's assembly line technology that reaped considerable economies of scale for the American motor vehicle manufacturer. Lewchuk (1993) has shown that industrial relations strategies in the Ford motor company were effective at extracting surplus

labour effort. However, because of the unproductive British bargaining environment, Ford was reluctant to impose American methods of job control on British labour. American entrepreneurs were better placed to undermine craft control and trade unionism, which gave rise to a more favourable technological trajectory.

Different development trajectories were also characteristic of British and American enterprise overseas. By 1914 Britain was by far the largest exporter of capital, approximately 40 per cent of which took the form of direct investment. By 1939 there were more than 350 British manufacturing firms engaged in multinational enterprise (Nicholas 1983). Successful overseas expansion depended on a firm's ability to internalise market transactions. During the 1920s and 1930s British firms relied heavily on the security of Empire, while American firms increasingly invested in Europe. Although the 'safety' of Empire markets provided British firms with more favourable appropriability conditions, lack of competition may also have stifled entrepreneurship. American direct investment in Europe, by contrast, built on a combination of technological superiority and organisational capabilities. As exemplified by American pre-eminence in the motor vehicle industry (Foreman-Peck 1982), these advantages gave rise to a different and crucially productivity enhancing course of development.

CULTURE, WEALTH AND THE ENTREPRENEURIAL SPIRIT

In addition to economic factors Britain's rigid class structure and a system of social and cultural attitudes is said to have inhibited economic development. Wiener's (1981) prominent thesis on culture and economic retardation envisages a cultural *cordon sanitaire* of aristocratic attitudes and aspirations encircling British society. Industrialists pursued gentrification as a means of achieving social status. Cultural forces set in motion an anti-industrial, even anti-capitalist, spirit.

The thesis of culturally led decline has been heavily criticised. Wiener's account has been castigated as presenting a selective array of poetry, English literature and the views of selected opinion makers rather than comprehensive and systematic evidence on business performance. Furthermore, anti-business attitudes can be found in Britain before, during and after the industrial revolution. An intellectual tradition of hostility towards business can be extracted from historical and political literature in Germany and the United States, both of which are traditionally contrasted with the British model (Collins and Robbins 1990). Coleman and Macleod (1986) commented that the 'industrial spirit', like Max Weber's 'spirit of capitalism', floats nebulously in the air with no hard evidence to show that it motivated business decisions. Behind the rhetoric of entrenched middle-class values the cultural thesis moulds the Victorian

philosophy of 'self-help' into a schema in which individualism, vigour and entrepreneurial drive are dominated by the desire for material prosperity in the form of gentlemanly pleasures. Although it remains a fair deduction that the pursuit of wealth was linked to the pursuit of social status this need not have been inextricably bound within an anti-capitalist ethos.

This point is central to the recurrent cultural debate concerning the propensity of businessmen in the late nineteenth century to be engaged in the market for land. A preference for social cachet, or leisure, is alleged to have weakened the industrial spirit as businessmen moved their resources from profitable business investments into loss-making landed estates. Pseudo-aristocratic values replaced entrepreneurial drive. A pre-existing landed elite continued to dominate society for much of the nineteenth century and the desire for assimilation was absorbed into the ideology of business culture. It then follows from this argument that, if businessmen were integrated into high society through land purchase, they could devote less time and energy to their businesses.

But landownership by businessmen did not necessarily involve accommodation to the gentlemanly ideal. According to Gunn (1988: 29) we should not comply with

a simple correlation between social behaviour, ideology and economic practice. It was perfectly possible for a Victorian industrialist to ride with the local hunt, build himself a castle in the country and adopt a 'neo-feudal' pose of paternalist employer without consciously compromising in any way the imperatives of capitalist production or class commitment.

Furthermore, research by Rubinstein (1981a, 1981b, 1996) and by Nicholas (1999a, 2000a) questions whether businessmen held land on a large scale in the late nineteenth century, or indeed whether landed assets comprised a significant element of a businessman's wealth portfolio. Contrary to conventional wisdom (Thompson, 1963, 1990a, 1992, 1994) this research finds that large-scale landownership by businessmen was not a broad avenue of assimilation between old and new wealth. This is not to say that British entrepreneurs ignored the pursuit of gentlemanly fashions and the trappings of high society. Relatively small plots of land, such as those that Habakkuk (1994: 613–14) describes as 'mini-estates' of 200 acres or less, could be bought for residence with a view to social status. Additionally the growth of London and the provincial districts as social centres in the late nineteenth century created an alternative form of urban gentrification. The acquisition of a country mansion or landed estate was only one expression of cultural decadence in Victorian society (Nicholas 2000b).

Given the difficulties inherent in assigning a causal link between cultural variables and business performance, Nicholas (1999b) attempted to establish an objective criterion for analysing entrepreneurship by

utilising lifetime rates of wealth accumulation as an index of success. Profit seeking defines the entrepreneurial function in Nicholas' work; this leads to a model which utilises rate of return calculations to distinguish between wealth due to inheritance and wealth stemming from entrepreneurship. The application of this method to a large sample of British entrepreneurs revealed that industry, region and religious dissent cannot explain performance differences. By contrast, education and entrepreneurial type are the important predictors. Third generation entrepreneurs (and more generally those who inherited firms) experienced relatively low lifetime rates of wealth accumulation compared to entrepreneurs who founded firms. An education at a public school or Oxbridge college was also associated with an inferior business performance. Despite the difficulties in empirically estimating lifetime rates of wealth accumulation, this method does reveal robust insights into aspects of culture and entrepreneurship. An application of this method to a data set of French entrepreneurs (Foreman-Peck *et al.* 1998) highlights opportunities for further research in this area and a potential for cross-national comparisons.

The four aspects of culture studied by Nicholas – firm type, education, religion and type of industry/region – are central to the hypothesis of culturally induced economic decline in Britain. All of these areas have been extensively studied in economic and business history, though not without controversies. The following sections detail how the cultural argument has been advanced through observation, case study evidence and the application of economic theory to historical problems.

Family firms

Cultural explanations of Britain's relative economic decline often assume a connection between family capitalism and entrepreneurial failure. Businessmen, it is alleged, were fundamentally conservative and reluctant to try new and untested methods. The typical firm in the late nineteenth and early twentieth centuries was family owned and controlled and characterised by patronage and nepotism in recruitment patterns. Most references to this view cite Landes' (1969) classic account of European industrialisation in which late nineteenth-century Britain was plagued by a combination of entrepreneurial lethargy, complacency and cultural conservatism. According to Landes, British entrepreneurs were like their French counterparts in that they lacked drive, initiative and imagination. The problems of industry were reflected in distaste for competition and a preference for leisure pursuits. Firm founders and their families continued to shape resource allocation decisions in a way that significantly handicapped the economy.

However, studies of individual family dynasties show that family firms were not always badly managed or profitless. The Gregs of Styal

maintained the entrepreneurial drive into and beyond the third generation as cotton industrialists (Rose 1977). Barker's (1977) study of Pilkingtons, the glass manufacturer, documents the history of a largely family owned and controlled business in the vanguard of technological advance. Alistair Pilkington, born in 1920 and educated in mechanical sciences at Trinity College Cambridge, was the inventor of the float process that established Pilkingtons' advantage over foreign rivals in the manufacture of glass. Foreign manufacturers using the more expensive grinding and polishing process were eventually forced to purchase licences from Pilkingtons. The float process was developed over a ten-year period which required sustained funds for investment. According to Barker, family ownership and control facilitated the provision of investment capital that might not have been forthcoming had the directors of the company been accountable to a series of outside shareholders.

Family firm studies document the view that success often depended on the right combination of management and personality rather than on a specific form of corporate structure. The success of Rowntree (the York producer of chocolate and confectionery) in the 1920s and 1930s was accompanied by the recruitment of new managerial personnel, although leading family members retained control of the firm. Arnold Rowntree developed the firm's advertising strategy based on market research, product development and branding. Seebohm Rowntree, the famous social scientist and activist, introduced a 'functional' structure to the company in 1921, and was a prominent management theorist. Rowntree contradicts the classical stereotype of family-based entrepreneurial lethargy (Fitzgerald 1995).

Recent work on family firms, however, has reinforced the conventional viewpoint that inherited business ownership and control more often acted as a brake on the growth of firms and the development of the economy. Mark Casson (1999) identified a trade-off between a positive effect of dynasty – trust between family members and a concomitant reduction in transaction and agency costs – and a negative effect, the reluctance to recruit outside professionals. Whether the economy benefits or suffers depends on the distribution of economic activity. While 'dynastic firms are well-suited to craft-based industries where the optimal scale of production is small' this form of industrial organisation is 'inappropriate for science-based industries in which the optimal scale of production is large' (1999: 11). This standpoint provides an important explanation for the success of family firms in Britain's industrial take-off, while explaining why Britain was slow to adjust to the world of corporate capitalism, which was associated with newer technologically dynamic industries.

Chandler's (1990) treatise on the *Dynamics of Industrial Capitalism* points to an unwillingness to embrace new managerial strategies as a specific cause of entrepreneurial failure in Britain. The peculiar British

institution – the family firm – and its concomitant conservatism inhibited investments in manufacturing, marketing and management. Consequently, British firms failed to capture economies of scale and scope inherent in new technologies, particularly those associated with the industries of the second industrial revolution. The Germans and the Americans seized these opportunities both domestically and internationally. There are several case studies of British intransigence in the Chandlerian thesis, but in the light of recent research the electrical equipment industry stands out. David and Wright (1999) attributed America's impressive manufacturing productivity growth rate of 5.5 per cent per annum between 1919 and 1929 to multiple causal factors driven by the diffusion of electrification as a general purpose technology. Between 1924 and 1937 total factor productivity in British manufacturing advanced at a comparatively slow rate of 1.9 per cent per annum. Through individuals like Joseph Swan and Sebastian Ferranti Britain possessed the inventive capacity to develop electrification technology. Yet British firms were unable to build up organisational capabilities such as those of George Westinghouse in the United States or Werner Siemens in Germany. While both of these firms could draw on pools of university-trained engineers, there was a shortage of such human capital in Britain (see chapter 3 above).

Indeed, Broadberry and Crafts (1992a) have argued that more attention should be given to the environment in which firms operated rather than to managerial strategies *per se*. The American labour productivity lead in manufacturing predates the emergence of the large-scale Chandlerian corporation. Although the forces envisaged by Chandler are relevant to the Anglo-American productivity gap, they do not explain a large part of it. Rather, a confluence of factors, including collusion between firms, deficiencies in human capital and an unproductive bargaining environment, explain Britain's comparatively weaker productive potential. Mercer (1995) has shown that market structure was a pervasive influence on productivity performance. During the interwar period British firms, under the patronage of government policy, chose to collude and cartelise as a means of regulating domestic competition. According to Broadberry and Crafts (1992a: 554), 'competitive forces were so weak as to allow degrees of freedom for managers to fail'. Economic theory suggests that competition policy would have had a favourable impact on technological development in interwar Britain because of the preponderance of conservative firms in which managers were reluctant to introduce costly (in terms of effort) but performance-enhancing technologies. The preferred option, industrial policy that subsidised incumbent firms, provided a greater scope for entrepreneurial slack (Aghion and Howitt 1998: 205–32). There is little evidence of a positive relationship between market power and innovation in interwar Britain. Policy makers prevented shifting the allocation of entrepreneurship away from rent-seeking activities.

Education

Education also takes a prominent role in the historical debate concerning the role of culture in influencing entrepreneurial performance. G. C. Allen (1979) suggested that the public (fee-paying) school bestowed gentility to the detriment of the late Victorian business community. Public schools instilled fine and noble values, but this was not conducive to commercial and industrial success. More specifically, the slow pace of technical advance, especially in the old staple industries, is ascribed to the near total exclusion from the public school curriculum of science and technology studies. According to Ward (1967: 38), 'one reason for [businessmen's] failure in the late nineteenth century lay in the growth of the public schools'.

A number of studies have questioned the validity of such claims. Rubinstein's (1994) detailed investigation of entrants to eight public schools – Eton, Harrow, Winchester, Rugby, Cheltenham, St Pauls, Dulwich and Mill Hill – showed that very few public school boys passed their later days as gentlemen. Comparatively few businessmen, compared with fathers active in the professions, sent their sons to a fee-paying school. Of those that did, their sons were not filtered out of business careers; indeed, they followed their fathers into business. Where the sons of businessmen did enter into non-business careers, Coleman (1973) has pointed out that this trend may have removed less gifted sons from the family firm before they could do any damage to it. The public school may not have functioned as an adverse influence on the supply of entrepreneurs. Rather it may have acted as an effective safety net for the redirection of bad businessmen into non-business careers. If successful businessmen withdrew their sons from the business world by sending them to a public school, this may have cleared the way for a succession of newcomers with the requisite skills and drive necessary for successful entrepreneurship.

Furthermore, it is not clear that a classical curriculum was always detrimental to a business career. Berghoff (1990) maintains that it is difficult to understand the willingness of the upper class to place their savings into financiers' hands without taking account of bankers' social integration. In commerce and finance it is possible that the determination to recruit the 'English Gentleman' was a focus of competitive success. An implicit training in leadership qualities, a high level of self-confidence and connections through the social pecking order may have been advantageous. High social status among bankers was a function of political ties, kinship, intermarriage and education. In Cassis' (1985) study of Victorian bankers, 45 per cent had been to Eton, and 26 per cent to Harrow, which contributed to the forming of a cohesive banking elite.

Sanderson (1988) further challenged the idea that a high social status education exclusively involved the study of classics, demonstrating how an education at a public school, or Oxbridge, was not unchanging from

the late nineteenth century onwards. The nature of scientific and technical education improved radically in the 1890s and 1900s in response to institutional pressures. At Oxford, the Honours School of Natural Science was introduced in 1852 and the Natural Sciences Tripos began at Cambridge in 1848. A chair of engineering was founded at Cambridge in 1875. Outside Oxford and Cambridge, the London and civic universities were closely integrated with industry, either in origins and development or in the provision of scientific and technical instruction. University College London opened in 1826 giving priority to science and engineering and King's College London was founded in 1828 with a similarly progressive attitude towards vocational studies. The state was not actively engaged in the finance of the civic universities until 1889 which meant that private benefactors, often from commerce and industry, played an invaluable role in the early development of provincial higher education. For example, Sheffield University resulted from the merger of institutions including colleges founded by the steel masters Mark Firth and Sir Frederick Mappin.

However, differences between British and European education systems are invariably invoked to explain comparative economic growth rates. In Britain the most esteemed schools and universities taught classics. Education was liberal in outlook pursuing classics as part of an educational philosophy. By contrast, the French education system was biased towards technical education. The *Ecole Polytechnique* in Paris was one of the earliest and most prestigious technical schools. The German education system in the late nineteenth century was largely state controlled and emphasised science, empiricism and a critical approach to knowledge. In 1902 there were 1,433 engineering students in British universities compared with 7,130 in the six leading *Technische Hochschulen* in Germany (Roderick and Stephens 1972). Britain maintained a much smaller stock of university-trained engineers than rival nations, which constrained British competitiveness in high-technology sectors such as chemicals and electrical engineering.

However, other research questions the claim that comparative differences in educational backgrounds explain entrepreneurial performance more generally. Pollard (1989: 213) compared British and German education systems, arguing that by 1914 British education and science 'was a not unworthy component of what was still the richest and most productive economy in Europe'. Berghoff and Möller's (1994) comparative analysis of British and German businessmen highlights continuity in cultural characteristics, disputing the common perception that British entrepreneurs were tired pioneers relative to their dynamic German counterparts. The majority of businessmen in their German sample had received a classical education at the prestigious *Gymnasium*. Only a small minority attended the *Realschule* with its bias towards science, technology and modern languages. Although Cassis (1997) has identified superior

education characteristics among a sample of French business leaders, he claims that this did not translate into a superior entrepreneurial performance. The French system was highly technical, but the abstract nature of the syllabus did little for the businessman or the entrepreneur.

Religion

The third prominent aspect of the cultural thesis is the link between religion and entrepreneurship. Many commentators have followed Max Weber's theory of 'ascetic Protestantism' and have seen nonconformist religious dogmas and patterns of behaviour as a major reason for early industrial success in Britain. Religious persuasion was second only to kinship in eighteenth-century life, according to Ashton (1955). For Kindleberger (1964), religious outgroups – or the lack thereof – were at the hub of the industrial process: 'why did not new enterprises elbow their way to the forefront in Britain after 1880? . . . the hungry outsiders – immigrants, Quakers, Jews and lower class aspirants to wealth diminished in numbers or in the intensity of their drive' (1964: 133).

A number of studies have made empirical connections between nonconformism and entrepreneurial success. Foster's (1974) study of class and the industrial revolution identified a fundamental split between an older more conservative sector, predominately Anglican, and a new liberal section, mainly nonconformist. Prior and Kirby (1993) have shown how Quakers active in the north-east developed mutual systems of support whereby access to information and trading patterns proved a catalyst for the growth of firms.

However, strong religious beliefs could be a mixed blessing for business enterprise. The case of Rowntree, the Quaker chocolate and confectionery manufacturers, provides an example. Quakerism engendered paternalism towards workers and enhanced Rowntree's reputation for product quality. Yet an antipathy towards advertising arising out of Quaker religious values also hindered the company's development. Joseph Rowntree (in office as chairman between 1897 and 1923) opposed mass-marketing, which led to a crisis in the company's fortunes. In an age when branded consumer products were promoted through advertising, Rowntree was less able to compete in the mass-consumer market (Fitzgerald 1995).

On the other side of the religion and entrepreneurship debate, researchers have questioned the accuracy of studies that cite seemingly large shares of nonconformists within the business community as evidence for a connection between religion and entrepreneurship. Howe (1984) discovered that the religious composition of a sample of Lancashire cotton manufacturers in the middle of the nineteenth century did not deviate substantially from the denominational structure of the region implied by service attendance figures. Rubinstein (1981a) has pointed out that Hagen's (1962) study of social change, which identifies a large share

of dissenters in a sample of eighteenth-century industrial innovators, does not provide evidence to show that dissenters were overrepresented compared with their total percentage in the British population. His own research into Britain's wealth holders identified a small proportion of nonconformists at the top of the British wealth structure. Only 15 per cent of his top wealth holders were nonconformists in religious affiliation.

Berghoff's (1995) research in turn refutes the Howe and Rubinstein hypotheses. Berghoff identified a comparatively large share (61.3 per cent) of nonconformist first generation entrepreneurs in a sample of leading provincial businessmen, providing evidence for the notion that nonconformists substantially strengthened entrepreneurship in Britain. Berghoff is careful to point out, however, that statistical facts are not fully informative because 'there are numerous examples of pleasure-loving dissenters and frugal Anglicans alike' (1991: 235). The overrepresentation of nonconformists among first generation businessmen may not have reflected disproportionately strong business acumen and entrepreneurial drive, but social constraints on entry to alternative career paths. Nonconformist theology was not the handmaiden of entrepreneurial success; rather with external constraints imposed, networks and mutual support systems facilitated the movement of nonconformists into relatively open business careers.

Region and industry

The final strand of the cultural thesis is the postulate that Britain is a country whose comparative advantage has always rested in commerce and finance, so that modern British history is seen as a conflict between commercial and industrial capitalism. Hobsbawm (1968: 151) explains: 'as her industry sagged . . . her finance triumphed, her services as a shipper trader and intermediary in the world's system of payments became more indispensable'. Cassis (1985) shows that bankers and merchant bankers were from privileged sections of society and predominantly educated at socially elite institutions. These traits supposedly culminated in Britain's relative industrial decline, yet were the same traits that sustained Britain's competitive commercial and financial success.

According to Rubinstein's (1977, 1981a, 1994) analysis of the British wealth structure, the economy was oriented towards commerce and finance. Success in these fields militates against traditional declinist allegations, which focus on manufacturing and industry. Rubinstein (1994: 35) views the industrial revolution through the other end of the looking glass as 'no more than a brief interruption of factory capitalism'. However, data on the estates left by top British wealth holders reveal significant regional and occupational differences. London society was dominated by links with commerce and finance. Of those leaving more than £500,000 at death between 1809 and 1939 a larger share were engaged in commerce

and finance than in industry and manufacturing. London was the centre of wealth in nineteenth and early twentieth century Britain, and there was a general subordination of industrial to commercial and financial wealth.

But how deep-seated was the influence of the City elite on the British social structure? Chapman's (1984) list of merchant banks with a capital exceeding £1 million before 1914 shows that firms with aristocratic connections like the Grenfells, Barings and Rothschilds formed only a minority of the British banking community. Several authors argue that Rubinstein's methods of indexing the fortunes of top wealth holders in Britain do not support his claims that London commerce and finance dominated wealth making. According to Pahl (1990: 231), Rubinstein 'reifies this notion of a wealth structure into some kind of sociological concept without making clear what this particular notion is supposed to show or to do'. Wealth is just one determinant of class; the central importance placed by Rubinstein on the fortunes of a few large wealth makers may be misplaced. Economic development does not take place in a vacuum characterised by a dualism of the City and industry. Indeed the emergence of multi-plant firms and multinational operations makes it difficult to pinpoint the geographical and occupational sources of wealth. Ludwig Mond in the chemicals industry established branch-manufacturing units in Sandbach, Cheshire, Clydach near Swansea, and Brimsdown, Hertfordshire. The Shell Transport and Trading Co., the British holding company of the Shell Group from 1907, maintained central offices in London but exploited oil reserves from Russia to Borneo acquiring production and distribution outlets all over the world. The economic sources of wealth cannot be neatly separated into regional and occupational groupings.

Some critics have used Rubinstein's groupings in order to test his hypothesis, resulting in strong evidence to suggest that commercial and financial fortunes did not overshadow industrial ones. Berghoff (1995) has identified almost equivalent proportions of 'big' industrialists (the owners or managers of firms with 1,000 or more employees) and elite City bankers within wealth ranges including the millionaire class. The industrial revolution created a new stratum of wealthy individuals in provincial districts, which did reduce the significance of London as a location of great wealth. Nicholas' (1999c, 2000b) investigation of wealth holders in the upper echelons of British society, as well as those lower down the scale, concurs with this view. Analysis of the distribution of wealth for a group of 790 businessmen born between 1800 and 1880 reveals that industrial and provincial wealth was not inferior to wealth generated in commerce and finance and in London. Industrialists, manufacturers and entrepreneurs active in provincial districts played an equally important role in the wealth-making process. Although London was distinctive in terms of the social and political ties of its wealth elite, as shown by estate-size, there was no regional or occupational dichotomy.

SUMMARY AND CONCLUSIONS

To determine the factors that contribute to the efficiency of entrepreneurial activity is to study one of the central elements of economic growth and performance. Marshall (1920) made entrepreneurship a fourth factor of production differing fundamentally from land, labour and capital. Schumpeter's (1911) work, upon which branches of modern growth theory rest, attributes to the entrepreneur a vital role in introducing new goods, developing new methods of production, opening up new markets and creating a different type of industrial organisation. In the Schumpeterian schema the entrepreneur is the primary source of creative destruction, disrupting equilibrium through innovation.

To what extent were British entrepreneurs active in seeking out and exploiting profit-making opportunities? Did they drive the economy on to new paths of development? The neoclassical answer to these questions is that entrepreneurs were performing as well as they possibly could have done given resource endowments and exogenous technological possibilities. With an infinite supply of entrepreneurial talent and people, all opportunities presented by an economy will be exploited; competition drives poorly performing entrepreneurs out of business. Supporters of the neoclassical paradigm claim that entrepreneurs did not generally overlook opportunities for profit. Isolated examples of failure in making technological choices must be weighed against more frequent cases in which decisions embodied a rational response to economic conditions. Taken together, neoclassical research refutes the hypothesis of entrepreneurial failure in Britain.

But do entrepreneurs operate in a neoclassical world of perfect competition and exogenous technological change? The new growth literature seeks to model the economic environment more realistically by taking account of how entrepreneurs interact with institutions, how competition, financial intermediation, property rights and the legal framework affect entrepreneurial decision making and the allocation of resources towards innovative activities. To the extent that America and Germany benefited from technology trajectories conducive to endogenous innovation and learning, the first industrial nation's falling behind could be predicted. A combination of resource endowments, market size and institutional advantages created a favourable platform for growth in the newly industrialising economies. The British economy could neither parallel the developments taking place in these countries, nor benefit from international technology transfers.

If structural adjustment was a problem for the British economy, the reasons for economic decline need to be considered over a long time horizon. The high sunk costs of existing technology and infrastructure, which represented 'best practice' during the epoch of the industrial revolution,

may have blocked the introduction of new equipment and more efficient production processes later on. Moreover, the knowledge acquired for one fundamental technology might be of limited relevance to the next (Redding 2002). One theoretically appealing mechanism for understanding propagation along these lines is Broadberry's (1994) 'cycles of technological leadership'. Britain's early industrial development was based on low throughput technologies that took advantage of skilled labour. Incremental improvements to this system of production made it hard for Britain to adopt more modern high throughput methods which characterised the American system of manufacturing. Yet it is also important to remember that 'the moral suggested by these historical experiences [is] not at all about "mistakes"' (David 1970: 20). The dynamic process of economic growth embodies multi-linear development trajectories. A different history of investment decisions could have produced an alternative path of cost-minimising technologies, and therefore Britain's incapacity to benefit from mass-production and organisational developments may not be synonymous with entrepreneurial failure.

On the other hand, the Schumpeterian model envisages entrepreneurs as agents of creative destruction whose role is to upset the *status quo* by unlocking predetermined paths of development. The task of the entrepreneur is to establish new opportunities as well as to exploit existing ones. While traditional staple industries such as cotton were fettered by initial technology choices and competition from overseas, the more salient issue is perhaps why resources were kept in unprofitable areas of development. Mokyr (1990: 266) comments that 'British society as a whole clearly lost its knack for taking advantage of the innovations associated with the Second Industrial Revolution'. In America, electricity was tantamount to a 'leading sector', facilitating a productivity surge with its knock-on effects throughout broad sectors of the economy. The British failure in the dyestuffs branch of the chemicals industry is notable, and provides a lens through which to view more general weaknesses in the economy. Due to pioneering inventions relating to processes for making dyes by chemical synthesis, Britain held a mid-nineteenth-century lead in this industry. Yet a failure to devote resources to new systems of production and scientific education and research caused Britain to lose out to German industrialists who made the necessary investments. Germany's comparative advantage was based on better institutions. High-technology industries gave rise to synergies, cumulative expansion and learning. The interaction between science, human capital and organisational capabilities became a driving force for rapid economic development.

Inferior institutions reduced the capacity of the British economy to respond to new competition. Notwithstanding differences in the character and size of markets, the strength of organised labour inhibited the transfer to Britain of American mass-production methods. The ability of firms to benefit from economies of scale and scope depended not only

on the visible hand of managerial hierarchies, but more significantly on whether the operating environment was conducive to absorbing new techniques. While financial systems in America and Germany mitigated agency costs and informational asymmetries by providing venture capital and supervisory advice, capital markets and corporate governance practices stood as barriers to the growth of enterprise in Britain. Government policy further undermined the efficiency of firms by failing to establish a legal infrastructure for the development of large corporations. During the interwar years policy was lenient towards restraints of trade at a time when competition policy should have been invoked to compel firms to innovate in order to survive. Entrepreneurship can both generate and retard economic growth. Government policy has an important part to play by encouraging the allocation of entrepreneurship away from rent-seeking activities (Baumol 1988).

Whether there was more or less rent-seeking in Germany and America is not known, but what did distinguish these countries, according to a number of authors, was their cultural attitude towards entrepreneurship. British cultural decadence supposedly negated individualism and drive through the pursuit of social status and gentlemanly pleasures, which hampered performance in manufacturing and industry. Attempts to refute this explanation of decline have reinterpreted modern British economic and social development as being primarily commercial and financial in locus. This hypothesis has typically floundered for lack of supporting evidence. Conventional wisdom suggests that culture is an important determinant of entrepreneurship, and supporting evidence comes from conceptual and empirical research linking cultural variables with a measure of performance – lifetime rates of wealth accumulation. Even though firm inheritors tended to run down their assets over generations, privileged access to the entrepreneurial labour market gave inefficient heir-controlled firms the opportunity to survive. Such links between entrepreneurship and culture critically impact upon a country's economic performance. For Schumpeter (1939: xi) the 'circular flow' was useful 'even beyond the boundaries of economics, in what might be called the theory of cultural evolution'. McCloskey (1998: 300) confirms that 'we need culture' to understand the character of economic growth.

Drawing together the literature on entrepreneurship and wealth accumulation, one central, but still elusive, question remains – did British entrepreneurs fail? It has become an orthodoxy in economic history that Britain's economic pre-eminence as the first industrial nation was short-lived; during the late nineteenth and early twentieth centuries British entrepreneurs could not keep pace with the competition. Yet opinion is divided on performance standards, and therefore success and failure are not homogeneous entities in the literature. British entrepreneurship was subject to a confluence of factors, economic, social and cultural. The American economist Frank H. Knight, who wrote extensively on

entrepreneurship in the early twentieth century, explains that ‘the ownership of personal or material productive capacity depends on a complex mixture of inheritance, luck, and effort, probably in that order of relative importance’ (1923: 598). In Britain there was too much inheritance as social structure and family capitalism preserved the *status quo*, insufficient luck in terms of resource endowments and market size, and too little effort on the part of entrepreneurs to break out of existing paths of development.