New perspectives on the late Victorian economy

Essays in Quantitative Economic History 1860–1914

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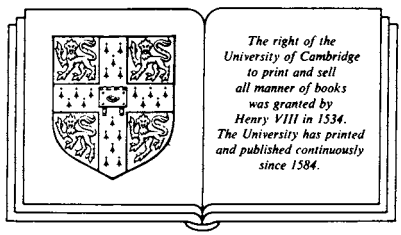

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Chapter 1

Quantitative analysis of the Victorian economy

James Foreman-Peck

Long after all participants have passed on, the Victorian economy continues to exercise powerful influences, both open and concealed, over economic policy and attitudes, as well as through the legacy of economic structure. Perceptions of how the economy worked and how well, form the background to a number of present-day concerns. Economists allude to the Victorian economy as a period of competition in opposition to today's oligopolistic industry, social commentators contrast the provisions of the modern welfare state with the inequalities generated by Victorian *laissez-faire*, and Mrs Thatcher appeals to Victorian values to provide the social cement necessary to bind society together.

The later Victorians were more prone to question their society than their mid-century forebears. British industry was more often described as uncompetitive (Williams 1896, Stead 1901) and social reformers (Mearns 1883, Booth 1902, Rowntree 1902) provided evidence for criticising the distribution of the gains from their expanding industrial society. Criticism has continued ever since. On the side of production, the Victorians have been blamed for dissipating the head start of the industrial revolution, and neglecting opportunities to lay the foundation for an advanced, technological, competitive British economy in the twentieth century. Inadequate attention to education and industry and too much concern with class, leisure and empire slowed economic progress, while the more vigorous Germany and the United States overtook Britain (Wiener 1981, Barnett 1986). Victorian and Edwardian economic structure was a poor inheritance for the later twentieth century (Crafts 1985). An increasing commitment to the world economy concentrated the British economy on the production of goods from a few sectors, the market and technological prospects for which were not bright. With the stagnation and collapse of the world economy in the years between the world wars, the consequence of this overcommitment was persistent mass employment. In turn unemployment cleared the ground for the acceptance of the ideology of the welfare state and Keynesian economics for a generation or more after the ending of the Second World War. According to Olson (1982), reforms

after the Second World War must have been a form of 'institutional sclerosis', presumably halted by the advent of Mrs Thatcher's economic policies in 1979.

Most of these pessimistic judgements have been strongly contested, among others by Pollard (1989) and McCloskey (1981). Sanderson (1988) and Rubinstein (1988) offer an antidote for the condemnation of British education and class. The present volume casts further light on claims about the performance of the Victorian economy and therefore about its relevance as a model for contemporary society. Some of the essays establish accepted conclusions more firmly by deploying new evidence or methods. Others direct our attention to aspects of the Victorian economy which have been unwarrantedly neglected. A third category reassesses traditional views. The picture offered is a complex and varied one. This was a growing economy, dependent on a rather narrow range of technologies, creating institutions in response to changing aspirations and accumulating experience. At least the monetary sector was still controlled by a doctrine pessimistic about the possibilities of state action and by a small number of influential persons.

1.1 Theory and quantification

Not only are the following chapters unified by their concern with the later Victorian economy (which is here taken to include the Edwardian economy as well) but also by a method which the subtitle of the book refers to as 'quantitative'. This term is not especially apt but is adopted here because of the name of the study group to which earlier versions of the chapters were presented. That name in turn reflects the peculiar response of British economic historians to the spread of econometric methods and formal economic modelling into the subject from across the Atlantic during the 1960s (*History Today* 1985), pp. 36–7). In fact the essays are as united by their use of theory as in their application of numbers. It is theory which gives rise to counterfactuals; what would have happened had things been different?

The usefulness of a theory in a historical explanation depends upon the correspondence of its assumptions or premises with the salient facts. Therefore in the present chapter which surveys the main results and approaches of the essays in this book, reference must be made to other studies which do not depend upon any explicit theoretical apparatus. In addition because the chapters only partially cover the later Victorian economy, a brief outline is offered of some other recent quantitative and analytical work on the period.

Theory is closely linked to quantification. The Victorians poured forth an unprecedented volume of official statistics, and businesses and other private organisations greatly augmented these with their records. Each publisher or keeper of statistics at least originally had in mind a purpose which would be served by the information. Company accounts were originally intended to show shareholders that their capital had not been dissipated or mismanaged. Trade statistics were collected because trade was a source of government revenue. Bank of England lending (bills discounted) was published because the stability of the monetary system which the Bank supervised and, in particular, Bank conformity with the 1844 Banking Act, were matters of public concern. This last is a clear example of theory influencing the generation of data. In the other two cases 'theory' may seem a pretentious term for generalisations such as 'the more imports that enter the country the more revenue can be raised at unchanged tariff rates' and 'credits equal debits'. But even identities, statements which are true by definition, such as credits equal debits, are low level theories which may have profound consequences for the way we view the world (for example Baines 1985, Foreman-Peck 1989a).

Money supply statistics and national income accounting are cases in point. The Victorians constructed no official figures for national income, expenditure or output, or for broad money, although a few attempts were made to produce numbers for one or two years by private individuals. Money supply aggregates (Capie and Webber 1985) are in the process of changing our perception of the later Victorian macro-economy. Reconstructions (Deane and Cole 1962, Feinstein 1965, 1972, Greasley 1986) of national income and component aggregates for the nineteenth century, in a manner consistent with modern definitions and theory, have already provided the basis for a continuing reassessment of Victorian economic growth. One of the results of the new data has been the claim that the slowing down of economic growth, in manufacturing at least, was Edwardian, not Victorian (Matthews, Feinstein and Odling-Smee 1982). Cross-national comparisons of national income growth have confirmed the earlier more qualitatively based view of the British economy falling behind those of newer industrialising countries (Maddison 1982).

1.2 The macroeconomic approach

Interest in national income accounting is based in large part upon the belief that what is being exhaustively measured is the actual or potential production of goods and services that people want for consump-

tion. But, in the long term, economic development could cause a divergence of measured national income from the flow of goods and services actually desired. Ignorance of buyers as to the performance or the effects of increasingly complex products, elimination of previously free facilities, goods or services, such as quietness, rights of way, common lands, and the need to pay for additional, formerly unnecessary facilities, including water and sewage services for towns which could be dispensed with in small villages, each of these might lead national income per head to overstate wellbeing, even when due allowance had been made for the distribution of that income. Broadly speaking, O'Brien and Keyder (1978) take this position in their comparison of British and French economic growth in the nineteenth century. The United Kingdom only appeared much better off than France. The reality was that Britain's road to development required the production of more intermediate goods, things not required for their own sake, which were mistakenly counted as final products.

An even more influential reinterpretation based upon accounting identities has been that of Crafts (1985). (Private) national output is composed of the constituent industry outputs. By examining the composition and industry productivity growth of national output and comparing this with the development patterns of other nineteenth-century European economies, Crafts concluded that the industrial revolution took place on a very narrow front; it was confined to a few industries and never pervasively affected the economy. Otherwise agriculture and mining would have been unlikely to experience the productivity slowdown they did from the 1870s. The service sector already employed 30 per cent of the workforce at the mid century, a proportion that had risen to 45 per cent by the outbreak of the First World War. Productivity growth in services, at 0.45 per cent per annum 1873–1913, was lower than the national average and tends to support Crafts' judgement about the narrow spread of the industrial revolution (Millward 1988).

The Panglossian view of the Victorian economy, that 'everything was for the best in the best of all possible worlds', emphasises that the British economy was supply constrained and that other countries were catching up by utilising a backlog of technology, that given her human and natural resource endowments, was not efficient for Britain (McCloskey 1981). The assumption of this view is that the market 'worked'. Conceivably as others have asserted (such as Elbaum and Lazonick 1986), there may have been a failure to establish institutions that would invest adequately in the

human capital that was so much more important in the new industries of electrical engineering and organic chemistry than in textiles, coal and iron and steel. Because they were more competitive, these sectors of late Victorian industry which employed lower than average proportions of skilled labour tended to export more than did the skilled labour-intensive sectors (Crafts and Thomas 1986). If the market did not 'work' (optimally) because of monopoly or monoposony power, conventional uses of total factor productivity indices (TFP) which underpin many of the above claims (and some of those of chapter 3) can be misleading (Nicholas 1982, Thomas 1985, Nicholas 1985).

By assuming that the economy was not working optimally, it is possible to calculate how fast the Victorian economy could have grown if more resources had been committed to those sectors capable of most rapid expansion and technological progress, taking the American economy of the period as a standard of comparison. Supposing industries with strong growth potential – chemicals, engineering, instrument production, paper and printing, electricity, telecommunications, construction and construction materials – expanded by more than in fact they did, requires that resources were notionally taken away from less dynamic areas – textiles, agriculture, net property income from abroad, domestic service and manufactured gas production and distribution. Expanding the high-productivity, high-growth prospect sectors by plausible magnitudes yields a gain of 4.55 per cent of average GNP by these sectors at the expense of the others. The shift in sectoral size would have raised aggregate-growth rates by 0.56 per cent per year from 1870 so that by 1913, output would have been 126.8 per cent higher than it actually was, a level not in fact achieved until 1946 (Kennedy 1987, pp. 58–77). More extreme but plausible structural shifts could have raised incomes per head by 150–200 per cent by 1913 according to this method of calculation.

The aggregate or macroeconomic approach to the Victorian economy (recently synthesised by Lee 1986) offers explanations and hypotheses at a high level of abstraction. The papers in this volume extend our understanding of the Victorian economy by a more detailed analysis of sectors or themes. This is an essential test of, and sometimes antidote to, macroeconomic generalisations. Although the chapters do not present a comprehensive coverage of the issues of the late Victorian economy (there is no analysis of the demographic slow down for instance and little on international economic relations) they do cover the three crucial themes of industrial organisation and technology, wages and living standards, and the monetary system.

Industrial organisation and technology underpin the record of economic growth and productivity increase discussed in the macroeconomic approach. Analysis of the experience with particular technologies and firms can offer explanations more fundamental than is possible at the macroeconomic level. The nature and distribution of the gains from productive activity ultimately justify or condemn an economic system. Hence the standard and cost of living, the extent of economic distress especially among the weakest members of society, and the method by which earnings are established, are no less fundamental economic issues than the efficiency of production. Neglected during the years of ascendancy of Keynesian economics, monetary history of the Victorian economy is well represented in the present volume. The monetarist counter-revolution was led by Friedman and Schwartz's *Monetary History of the United States.* It is therefore appropriate that in this reinterpretation of the Victorian economy detailed attention is given to monetary institutions, the functioning of the gold standard economy, and the influences upon monetary policy.

Before surveying the following chapters, some mention must be made of recent quantitative findings in two important fields not otherwise represented in this volume.

1.3 Later Victorian demography

Late Victorian deceleration of population growth became a phenomenon of particular interest to the world after 1945. Poorer countries then experienced population explosions on an even greater scale than that of the British industrial revolution, so that fears of a Malthusian crisis revived. Britain perhaps offered hope that population growth in these countries also would soon slow down.

A range of apparently competing explanations have been offered for the decline in fertility towards the end of the nineteenth century. One of the more imaginative but untested explanations was that the Victorian decline was due to corsets. These were allegedly so tight that female reproductive ability was impaired. Consistent with the pattern of fertility decline between the social classes, tight corsets began as a middle-class fashion before spreading down the social ladder. A number of other influences upon fertility have been tested however. Crafts (1984) showed that work opportunities for women were negatively correlated with birth rates between 1877 and 1938 because they increased the opportunity cost of children. He emphasised the costs of birth-control technology and used

illegitimacy as a measure. As birth-control costs proxied by illegitimacy fell, so too did marital fertility. Extramarital fertility was related to the organisation of work. According to Humphries (1987) it was the need to control fertility that accounted for Victorian sexual segregation at work. That is how she explains her negative correlation across regions between her index of sexual segregation and illegitimacy rates in 1851. Alternatively segregation might have taken place because of labour market discrimination against women; it was a means of maintaining male earnings. In this explanation lower illegitimacy was merely another consequence of segregation, not primarily a social adjustment to inadequate birth-control technology.

Turning to mortality, the second influence upon population size and growth, income distribution played a role in the late Victorian and Edwardian economy but legislation to improve safety at work probably did not. Haines (1985) found that infant mortality in England and Wales in 1911 was higher than in the United States in 1900 because of the greater income inequality in England and Wales. The larger English proportion of the very rich held their position at the expense of the lives of some very poor children. Adult mortality was apparently not reduced by the penalties under the 1878 Factory and Workshop Act imposed upon culpable employers on whose premises fatal accidents took place. The small number of inspectors and the low level of fines for violators rendered the Act rather ineffective (Bartrip and Fenn 1988). By contrast the Workmen's Compensation Act of 1897 raised reported fatal accidents. Possibly the greater chance of compensation made those at risk take less care, but the most likely explanation is an increased incentive to report.

The third influence upon population size and growth is migration. Late Victorian emigration assumed remarkably high proportions. By the 1880s falling shipping costs had sharply increased the proportion of single labourers, who were quite likely to return, at the expense of the permanent family migration of farmers and craftsmen of the 1840s. The majority of emigrants were not born in rural areas and emigration rates from rural counties were only marginally higher than those from urban counties, (the greater number of Late Victorians lived in towns, not in the country) (Baines 1985). Agricultural depression (itself a response to changes in the world economy) then can hardly have been a major force pushing workers overseas. Internal migration in Britain, unlike France and Sweden, did not respond to nominal wages but to urbanisation (Soderberg 1985). Regional variations in money wages were in any case lower in nineteenth-century Britain than in France, Prussia or Sweden.

Unfortunately, how much of this, if any, stemmed from smaller spatial price variations in Britain is unknown because of the absence of data.

1.4 Trade, empire and fluctuations

The late Victorian economy was extraordinarily open, not only in terms of the outward flow of labour, but measured by international movements of goods and capital also. The trade/GNP ratio of 1913 was not achieved again until the 1970s. Rapidly falling shipping costs, with the advent of the ocean-going metal hulled steamship from the 1850s, boosted international trade and specialisation (Harley 1980, 1988). A necessary condition for increasing international openness was political acquiescence. Since trade rose so rapidly, the British government could both receive a rising revenue from tariffs *and* reduce tariff levels and coverage (McCloskey 1981).

Elsewhere in late Victorian Europe acquiescence was not so easy to obtain. Cheap agricultural produce, especially wheat, depressed European farm incomes and rents. Those affected reacted with demands for higher tariffs. In Britain the agricultural sector had already been overshadowed in importance, politically and economically, by manufacturing and services. Consequently complaints from landlords went largely unheeded, legitimated by the widely held belief that free trade maximised national income. Yet had Britain maintained a higher tariff in the 1880s, she might in fact have been able to enhance her income at the expense of the rest of the world, by shifting the terms of trade, forcing down import prices by reducing the volume of import bought (McCloskey 1981).

In principle it is possible for shifts in the terms of trade with the expansion of the export sector to make a country poorer. Selling more exports drives down their prices. Conceivably more resources might be absorbed by the exports necessary to buy a given quantity of imports after the price fall than before. For this later period of the nineteenth century it was not this possibility of trade immiserisation but of capital exports making the country worse off than it need have been, that has exercised scholars. Pollard (1989) concluded it was a question of 'short termism'; that short-term earnings were maximised at the expense of long-run income generation. Kennedy (1987) pointed to the low investment in British industry and the capital market giving the wrong signal to investors, from the viewpoint of long-term development.

Contrary to much popular opinion the bulk of investment diverted overseas did not go to the British Empire. This misconception might be

traced to the conflation of the eighteenth-century mercantilist empire with the liberal empire of the nineteenth century and the coincidence of the vastness of the empire at its height in 1913 with enormous overseas investment and income. Very few administrators ran the empire and the British government tried unsuccessfully to ensure that it was self-financing (Davis and Huttenback 1986). Whereas viewed from Britain, investment and empire are frequently seen as disadvantages in retrospect, from abroad they are often represented as gains made at the expense of the host regions. Examination of the British balance of payments for this period and the balance of payments of India, the jewel in the imperial British crown, shows little evidence of exploitative returns, broadly defined, to British investment. Indeed the returns seem rather low (Foreman-Peck 1989a).

International channels can be sources of fluctuations in economic activity, but long cycles are traditionally given a technological origin. Cycles of fifty years duration, Kondratieffs, have experienced an upswing in popularity in recent years, promising to place economic history in front of a wider audience by providing some form of prediction (Lloyd-Jones 1987). Actually a twenty-five year building/population cycle seems to fit the facts better since 1850. This Kuznets cycle is also more plausible, given the normal lags in human reproduction between generations and the need to house new families (Solomou 1988). The likelihood of the structure of the economy remaining unchanged over periods of more than a century seems rather small. Cycles may be expected to have variable durations depending on the economic structure.

1.5 Production: technology, industrial organisation and competitiveness

Contemporaries at home and abroad were enormously impressed by the achievements of mid-Victorian industry, exemplified by the glittering success of the Great Exhibition of 1851. Yet during the last quarter of the nineteenth century the ability of Germany and the United States to surpass Britain in the development of industrially useful technologies was becoming obvious. Whereas Britain had been in the forefront of telecommunications in the 1840s with the electric telegraph, the telephone was invented in the United States and was introduced into the United Kingdom under American patents. Thanks to a number of innovators of which Stephenson was the best known, the railway was spread around the world by British engineers, but it was in Stuttgart that Daimler and Benz

produced the first practical motor car in 1885 and it was from France that the early British motor industry drew much of its technology. When motor production did get under way in Britain, in at least one major engineering firm it had to compete with far more profitable defence contracts and failed to do so (Irving 1975). The British environment seemed to have become far less congenial to industrial innovation. True, Britain was still at the frontiers of technology in the invention of the electric light bulb and in the compound steam turbine for the generation of electricity. But the most financially successful electrical company, GEC, was founded by a German immigrant, the British radio industry was begun by an Italian, Marconi, and Ferranti, whose Deptford power station of 1888–91 led the world, brought his company to the edge of bankruptcy by 1903 (Wilson 1988). The financial incentives were to encourage mergers without the reorganisation essential to compete with the large German and American advanced technology based enterprises (Hannah 1983, pp. 20–1, Davenport-Hines 1984).

In chemicals too, Britain's early lead is generally judged to have been lost in the last quarter of the nineteenth century. The Leblanc soda producers neglected to switch to the ammonia process patented by the Belgian Solvay, perhaps because of the formation of the monopoly United Alkali Company in 1890 (Lindert and Trace 1971). Britain left the synthetic dyestuffs industry entirely to Germany. Unlike the pharmaceutical industry in Germany and the United States, British pharmaceutical firms failed to establish research and development departments and eventually suffered losses of market position accordingly (Liebenau 1984). Only in fairly low technology industry did Britain remain at the frontier of innovation through private enterprise. With Starley's invention of the safety bicycle in 1884 the bicycle industry took off and established a substantial export trade. The surgeon Dunlop's pneumatic tyre of 1888 clearly supported this boom. The Bowden brake was also the invention of an amateur, a journalist. The most successful saddle was designed by a Chelsea shoemaker and an Irish clergyman devised the spring clip for attaching a pump to the bicycle. Even in bicycles Starley's innovating firm, Rover, proved incapable of maintaining their early lead and abandoned bicycle production for the more profitable cars soon after the twentieth century began (Foreman-Peck 1983). Only the interests of national defence conjured up support for Marconi's radio and thus contributed to a temporary British lead in this field (Pocock 1988).

The above brief survey of the literature of Britain's alleged industrial decline is impressionistic. Although it suggests late Victorian British economic development may have been retarded by an unwillingness or