

Themes

Among the major manufacturing countries before 1914 Britain was the last to establish a sizeable motor industry; it was also the first to witness its collapse as an independent national enterprise. Whereas until the second decade of the twentieth century the emergence of the industry was relatively slow, production overtook that of other European countries between the wars. For a time the exceptionally favourable conditions immediately following the Second World War perpetuated Britain's lead in Europe as the world's second largest motor manufacturing nation and the biggest exporter of cars and of commercial vehicles.

Even before that time the industry's capacity to generate demand for materials and intermediate inputs from other industries, thereby increasing employment, signalled its potential to become a major force in the economy. After the Second World War the industry's strategic importance to the economy was underlined by its capacity to contribute massively to Britain's balance of trade at a time when foreign, particularly dollar, earnings were vital to the economy. This phase in the industry's development proved to be transitory, for the mid 1960s saw the beginning of a precipitous decline. Britain's 10 per cent share in the car output of the major vehicle-producing countries on the Continent of Europe, in the US and Japan had fallen to half that twenty years later. The American multinational companies (MNEs), Ford and General Motors (through its Vauxhall subsidiary), produced a similar volume of output in Britain to that made by British firms, and dominated sales in the domestic market.

Concern for the adverse impact of decline of an industry

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described by an influential parliamentary committee as of ‘central significance’ to the British economy led to *de facto* nationalization in 1975. Thirteen years later, the ‘national champion’, formerly British Leyland/BL, the remaining British-owned mass producer of motor vehicles (in which the Japanese firm, Honda, already held a 20 per cent share), was sold by the government. As ‘Rover’ the remaining skeleton of the British volume car industry became a subsidiary company of British Aerospace, a mixed defence and property conglomerate. Before the end of 1989 the three surviving British luxury car makers, Jaguar, Aston Martin and Lotus, had been sold to the American multinationals, while the car-making division of Rolls Royce was acquired by Vickers, the major military hardware manufacturer. The remnants of British commercial vehicle (CV) manufacturing were acquired by the Dutch firm, DAF, completing the demise of an independent British motor industry. The speed and scale of the industry’s decline is one of the most dramatic developments in Britain’s post-war economic history.

Except for war and the immediate post-war periods, the volume of goods and passenger service vehicles produced was roughly one-third the number of private cars and taxis; by value the difference was around one half (PEP, 1950, *Table 3*). During the inter-war period commercial vehicle makers were in many cases separate from car manufacturers, but the latter soon became also the largest CV makers, mainly as producers of lightweight trucks. When in 1968 a small manufacturer of specialist commercial vehicles took over the major British car producer to form British Leyland, the success of the CV branch of the industry was increasingly affected by the new company’s performance also as a mass producer of motor cars. This survey, therefore, will concentrate mainly on the car industry, and primarily on British-owned manufacturers. It focuses principally on interpretation rather than narrative. We highlight historians’ disagreements and assess the validity of sometimes conflicting explanations for international differences since the establishment of pre-eminence in Europe between the wars and the reasons for decline thereafter.

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The origins of British pre-eminence in Europe

(i) The rise of the British motor industry before 1914

Among the most striking contrasts presented by the early history of the motor industry is the technical success of French metal manufacturers in exploiting German patent inventions which formed the basis of the motor industry during the 1890s. Another is the scale and rapidity with which the industry was established a few years later in the US where in 1903 production overtook that of France. The emergence of a motor industry in Britain was slow by comparison, and was heavily dependent upon developments and the flow of information, imports and components from the Continent. With a few exceptions, notably the engineer, inventor and entrepreneur, Herbert Austin, who built the first all-British four-wheeled car in 1899/1900, company promoters and speculators showed more interest in the new industry than did the major engineering companies (Saul, 1962; Church, 1979). While their rationality in this respect has been questioned (Saul, 1962), in part this is explained by the higher rates of return on capital investment which large engineering companies, possessing the financial resources and engineering capacity to make cars in volume, were achieving from other activities (notably the production of armaments (Irving, 1975). Not until a broad consensus evolved among engineers and public on what constituted dominant motor design did other British engineer-entrepreneurs, many of whom were cycle manufacturers, began to invest in the sizeable production of British-made vehicles (Saul, 1962; Harrison, 1981).

A series of successful company flotations from 1905 reflected in part the resilience of investors following the disturbing and deter-

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rent effects of the activities of financial speculators dealing in the shares of motor and related companies. No fewer than 221 firms entered the industry between 1901 and 1905, of which 90 per cent had either discontinued motor production or ceased trading altogether by 1914 (Saul, 1962, *Table D*). Following the general liquidity crisis of 1907 business confidence returned (Michie, 1981; Lewchuck, 1985a), a recovery which the stabilization in design and the reduction in risk which that implied for investors may have assisted and strengthened (Nicholson, 1983, 3; Harrison, 1981). The main feature of the dominant design was the basic power train, which incorporated engine, transmission, clutch, drive shaft, differential and axle; these were the mechanical components which generated power and transmitted it to the driving wheels attached to the chassis. This standard form superseded the various three- and four-wheeled vehicles which were little more than tri-cars, quadri-cycles or dog carts. Other dominant design features by this time included column (rather than tiller) steering, front-mounted engine enclosed within an embryo bonnet, seating side-by-side (rather than face-to-face), pneumatic (rather than solid) tyres, and the option of a completely enclosed saloon car. Petrol became the acknowledged preference as the power source (Caunter, 1957).

Slow off the mark, the British industry lagged behind until a sharp rise in production began to close the gap between French and British output. While French production rose by barely one-third between 1909 and 1913 British output increased threefold. In 1913 British car (including commercial vehicle) production had reached 34,000, compared with 45,000 in France, and 23,000 in Germany. The European total, however, was less than a quarter of the output in the US.

Disparity in the size of national production did not mirror precisely the extent of national markets. Ownership density in the US was one vehicle for every 77 people in 1913, a figure derived from 1.26 m in use. The comparable densities in Europe were 165 in Britain, 318 in France, and 950 in Germany (Bardou, Chanaron, Fridenson and Laux, 1982; US Bureau of Census, 1976). Britain, therefore, was the largest market in Europe, to which the French were the major exporters. Much has been made of Britain's lag behind the Americans in the speed and scale of development. Saul

blamed British engineers, whose approach to the market, to product development and to production methods he described as having been 'well nigh fatal' (Saul, 1968, 224). Saul condemned the failure to invest in plant to produce in volume a small, inexpensive car of the kind which by 1910 dominated the American market and was more common in France than in Britain (Saul, 1962). He also criticized the passion shown by British engineers for an irrational pursuit of technical perfection and individuality, the exceptions having been individuals trained abroad. Lack of attention to new production methods, he argued, led to low productivity.

The basic problem is seen to have been the inability of the industry to 'free itself from the older traditions of engineering . . . the most crucial weakness was the failure to realize that the new engineering industries called for a complete change from the old ways of mechanical engineering so as to make full use of the new techniques of production engineering' (Saul, 1968, 224: 1962). Specifically, Saul contrasted British methods of manufacture with those based on repetitive production and the assembly of interchangeable parts. His criticism was that not only were these processes not widespread before 1914 but that British firms did not organize production in such a way as to exploit the new machinery to the full. In other words, the artisanal craft-based methods of manufacture continued to predominate until 1914 and beyond, whereas the American industry had already been transformed. Interchangeability, advanced division of labour and the assembly of standardized parts along a production line culminated in 1913 with Henry Ford's moving assembly line installed at the Highland Park factory near Detroit.

Finally, underlying these particular production weaknesses was the lack of 'commercial acumen' among those responsible for designing and selling cars (Saul, 1962, 41). These conclusions have been echoed elsewhere, contributing to a conventional wisdom. Mathias, for example, referred to decision-makers having paid more attention to technical than to market criteria, and added the absence of cost consciousness in most firms to the list of the industry's weaknesses (Mathias, 1983), a gloss on Saul's conclusions which points in the direction of entrepreneurial failure. Are his wide-ranging criticisms valid in the light of subsequent research?

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A comparison with the French industry suggests that higher levels of production in France cannot be explained by superior entrepreneurial performance or greater engineering imagination. The trend towards integrated manufacture, which has been attributed to the desire of engineers to make the entire vehicle themselves and to reject standardization, was no less characteristic of French manufacturers (Laux, 1976). Laux's detailed examination of French manufacturers' approach to markets found little evidence of low costs from large-scale production as supposed by Foreman-Peck (1979). Lewchuck argued that vertical integration did not, in any case, preclude standardization. Even by 1905 some of the larger British vehicle manufacturers were using American and British machine tools designed for repetitive manufacture and the assembly of virtually interchangeable components (Lewchuck, 1987). Typically in both countries production occurred in small batches, compared with the sequential flow production system in use in the large American factories. Small batch production involved a division of work between several gangs of workers who moved along a row of stationary assembly stands. Such a system also allowed rectification of defects by hand in product or jig design and fixtures. Whereas Saul took this as evidence of conservatism Lewchuck emphasized the British system's flexibility, suited for factories characteristically producing a variety of models for a limited and socially stratified market (Saul, 1962; Lewchuck, 1987). Lewchuck has also challenged the blanket condemnations of British compared with American productivity. His comparison of the productivity of British and American manufacturers making similar kinds of vehicles showed little difference, although the estimates which were the basis for the comparison were few and may not have been representative (Lewchuck, 1987).

As for the superiority of French-trained engineers, Laux found that barely one-fifth of the leaders of the French motor industry received a 'high-class education' in engineering. It is also evident that their approach to manufacturing methods was similar to that employed by their British counterparts. Furthermore the favourable French balance of trade in motor vehicles cannot be explained by superior marketing, for the large market for French cars in Britain was developed primarily by British agents (Laux, 1976). The larger British and French firms typically supplied a variety of

models at prices which the rich, the professional and business classes could afford. An emphasis on technical design and quality, 'fit and finish', rather than price competition, was characteristic of the motor trade in both countries until shortly before the war (Church, 1981). Indeed, the absence of striking differences between the strengths and weaknesses of the supply and quality of the factors of production and the extent and characteristics of the market in the two countries suggest that the critical factor explaining the more rapid early development of the French industry may have been a chance competitive advantage. This was secured in 1888 when Gottlieb Daimler approached French metal-manufacturing firms with a view to their becoming the first to manufacture his patent petrol engine, and so initiate an industry based on the internal combustion engine (Nubel, 1987).

After the initial pioneering phase of the motor vehicle, the lag of British and French production behind that in the US and the contrasts in methods and approach cannot be explained without reference to the enormous difference in the size of internal markets. The levels and distribution of real income, and a social geography and rail density which by the automobile age had given Europe close and efficient communication systems both within and between towns and cities, were key differences. They were important factors which shaped entrepreneurs' perceptions of the market and the types of vehicles that could be sold. On the eve of the First World War the high productivity of Ford's American plant was based on economies of scale from production in large volume, interchangeable parts, special-purpose machinery and flow production, combined with a disciplined, highly-paid labour force. In 1913 Ford produced over 200,000 units, compared with some 5000 by Peugeot, the largest French manufacturer, and 3000 by the Wolseley Motor Company, the largest British car maker (Bardou *et al.*, 1982). The capital investment required to produce on an American scale, however, was justified only if it seemed possible to those in the industry, or to newcomers, that vehicles could be sold in such numbers and at a profit.

Perceptions of market possibilities began to alter both in Britain and in France shortly before the First World War, evidence of which is the repositioning by some manufacturers who began to build cars to sell within a lower price range than hitherto. In

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Britain the catalyst was Henry Ford who was persuaded by Percival Perry, formerly an importing agent selling Ford cars in England, to establish a branch. Tax advantages explain why in 1911 the branch, opened in 1909, was replaced by the Ford Motor Company (England), wholly-owned by the parent company. The assembly of Model T cars from imported kits began at Trafford Park near Manchester in the same year (Wilkins and Hill, 1964). The price of the Ford Model T Runabout was £135, and the Tourer £150. Designed to suit American road conditions in rural and urban America, to travel long distances, and to be within the purchase range of farm and business users, both were regarded by the British press as unattractive 'cheap and nasty' vehicles. Built with high horsepower and a slow-speed engine, the Model T could achieve smooth running without requiring the level of technical precision in the machining of parts that was needed in constructing the typically high-speed engines used in British cars (Wilkins and Hill, 1964; Saul, 1962).

The Model T proved successful in the British market because of its low price, roughly 25 per cent cheaper than the Morris Oxford. This was the 'popularly-priced' car introduced in 1913 to compete with Ford by the British car maker, W. R. Morris, whose recently established company was later to become Britain's largest car producer (Overy, 1976). The high productivity of American parts suppliers incorporated in the knocked-down kits dispatched from Detroit gave Ford an important cost advantage derived from large-scale production for the huge American market. Combined with Ford's highly efficient assembly plant at Trafford Park, Ford virtually created and dominated the cheap market for motor cars before 1914. Estimates of the sale of cars in the price range £200 and below, regarded by contemporaries as below the luxury and semi-luxury threshold, suggest that the 7310 Ford cars sold in 1913 accounted for more than 60 per cent of the total in that price range (Church, 1982).

While a handful of well established, though small, manufacturers ventured into the lower segment of the market from 1912, the major British entrant into the popular car market was a newcomer, W. R. Morris. Like most other car makers his origins were in the cycle trade, although whereas the founders of most firms which survived into the 1930s had some knowledge of engineering,

Morris was essentially a mechanic with an innovative inclination combined with a willingness to take risks. In 1912 the newly formed W. R. M. Motors began to prepare for the low-cost volume production of cars aimed at a popular market. The starting capital for this venture was £1000, which was supplemented by financial backing from the Earl of Macclesfield. Morris moved against the trend towards vertical integration by assembling cars entirely from components built by specialist suppliers on contracts, the system widely employed in the cycle industry. This strategy enabled him to exploit the human and physical capital resources of the engineering trade, to take advantage of their economies of scale, and to expand rapidly without the need for large capital expenditure (Andrews and Brunner, 1955; Overy, 1976).

The price of the Morris 8 h.p. Oxford basic model, first sold from a blueprint at the Motor Show in October 1912, was £175, enabling it to compete with the handful of other British cars aimed at the same market made by the Singer, Standard and Hillman Motor companies. Built to conventional high European standards of materials and finish, the Oxford incorporated a multi-cylinder engine of low horsepower, high speed and high efficiency. In order to compete with Ford, however, Morris planned a second model, the Cowley, lower in horsepower than the Oxford and lower in price. To meet his requirements for supplies of low-cost components in large volumes to make possible large-scale, low-cost assembly, Morris turned to the US, but his plan to commence volume production in 1915 was checked when war intervened (Andrews and Brunner, 1955).

(ii) War and its aftermath: gains and losses

Historians disagree on the effects of the First World War on British industry. Some have stressed the stimulus which virtually compelled British firms to adopt the production methods already widespread in the United States. Others have emphasized the damage caused to the economy by postponing the transfer of resources from the production of traditional goods to the manufacture of new products, notably consumer durables, thereby delaying structural change (Richardson, 1965; Alford, 1981).

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Effects on the motor industry were both positive and negative. War conditions restricted the demand for cars at a time when Morris was poised for mass production. The McKenna tariff introduced in 1915, imposing a $33\frac{1}{3}$ per cent *ad valorem* duty on cars and components, was intended to limit the import of an item 'extensively used solely for the purpose of luxury' and to save shipping space (Plowden, 1971, 110). One effect was to eliminate Morris's potential cost advantage over other British manufacturers by cutting off high-productivity American suppliers. Another was to accelerate the substitution at the Ford factory of parts made in Britain for those hitherto imported from the parent company. When it became clear that the tariff would remain in place after the war Ford's policy from 1920 was to move towards local manufacture entirely. By 1924 Ford was countering a 'Don't buy American' campaign by publicizing that Ford cars assembled at Trafford Park were 92 per cent British built, though at that time the Ford factory at Cork was a major parts supplier (Wilkins and Hill, 1964).

Alford stressed the gains in efficiency resulting from the stimulus war production gave to the adoption of interchangeable parts (Alford, 1986). The enforced learning experience of munitions manufacture did benefit Morris, but some other larger, longer established car producers already possessed considerable experience of the use of American special purpose machinery, interchangeability, and production with fewer skilled workers. Moreover, those large manufacturers, such as Austin and Wolseley, who supplied aeroplanes, armoured vehicles, ambulances and lorries for the war effort could learn less from the limited production runs normally required for these items. They also found difficulty in applying techniques used to manufacture shells to the production of immensely more complex motor vehicles after the war (Lewchuck, 1987; Church, 1979).

Of critical importance for post-war development was the effect of using standard jigs and tools and the subdivision of processes into simple tasks. This allowed semi-skilled, usually female, labour to be employed in the place of skilled male fitters (Andrews and Brunner, 1955). While this trend was present in car plants before 1914, war accelerated the progressive dilution of labour. Facilitated by the intervention of the Board of Trade in agreement with