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# When GM met Austin: British and American variants of inter-war automobile mass production

Peter Scott

Henley Business School, University of Reading, Reading, UK

**ABSTRACT**

Fordist automobile production methods are regarded as having been viable only in the USA prior to the 1950s. This article examines their potential in the largest non-North American automobile market—the UK, using recently-released documentation regarding General Motors' (GM's) abortive 1925 takeover bid for Britain's second largest car manufacturer, the Austin Motor Company. GM's plans for developing Austin as the leading UK car manufacturer show that existing British mass production methods could have yielded substantially higher productivity, when combined with American systems for achieving 'economies of throughput'. This, in turn, required tacit knowledge regarding 'flow production' methods, which GM executives identified as the missing element of Austin's 'elementary mass production' system. The article also discusses GM's detailed plans for Austin—utilising economies of scale, scope, and throughput to reduce prices to levels competitors would find hard to match—and their implications for the British automobile industry.

**KEYWORDS**

Fordism; mass production; automobiles; economies of throughput; technology transfer

## Introduction

Fordism constitutes perhaps the most spectacular process technology advance of the twentieth century, dramatically reducing the prices of US cars from the 1910s to the 1930s and thereby creating the first national 'mass market' for automobiles. However, it is generally agreed that Fordist methods were inappropriate for European nations before 1945, owing to their having insufficient numbers of people able to afford a car's purchase and running costs, even at Fordist prices.[1] These constraints are believed to have applied even to the largest non-North American market, the United Kingdom. The number of cars produced in Britain rose from just under a third of the European total in 1925 and 1929 to 42.9 percent in 1937. However, Britain's output was equivalent to less than 4 per cent of American production in 1925 and 1929 and (despite America losing much ground over the Great Depression), only 9.7 per cent in 1937, when British interwar production peaked at 379,300 cars.[2] Partly owing to the smaller market, 1928 British car prices were estimated to be almost 50 per cent higher than in the USA.[3]

**CONTACT** Peter Scott p.m.scott@reading.ac.uk

Fordist methods were attempted in Britain—by Henry Ford—who had established a British assembly plant at Trafford Park, Manchester in 1911. Low prices and a vigorous marketing campaign led to high initial sales and by 1913 Ford was Britain's leading car manufacturer with a 24 percent market share and the largest car factory in Europe, producing 6,138 cars annually.[4] However, Ford UK's dynamic chief executive Percival Perry was forced out in 1919, to be replaced by series of mediocre American managers who adhered to Ford's US product and marketing policies, despite their negative impacts on UK market share.[5] In addition to alienating their dealership network and blocking any modifications to the Model T to meet British conditions, Ford resisted calls to develop a small car for the British market, despite mounting evidence that—owing to Britain's tax system discriminating against large cars—the Model T's running costs were too high for the mass market.[6]

For a short period in 1925 it appeared that Ford's younger and more agile rival, General Motors (hereafter GM) was about to considerably extend its British interests, by acquiring Britain's second largest car manufacturer, Austin Motor Company (hereafter AMC), which had pioneered the development of very small cars. However, the negotiations fell through. While the bare facts of the aborted takeover are discussed in the literature,[7] very little information has previously been available regarding GM's views of Austin's plant and products, or their plans for AMC. However, GM recently donated the collected papers regarding the takeover, comprising over 500 pages of reports, memoranda, letters, and other significant documents regarding the acquisition (bound into two volumes just after the negotiations ended) to Kettering University Museum, Flint, Michigan.[8] British archival sources have also been examined, including a very small archive for AMC, at the Modern Records Centre, Warwick.

This article examines GM's assessment of, and plans for, AMC. Contrary to later statements by Alfred P. Sloan that they were unimpressed by AMC's plant and management, the contemporary records show that GM was enthusiastic about AMC's car designs and identified great potential for its plant to become a subsidiary that would dominate the British volume car market, partly by lowering prices to levels its competitors could not match. After discussing the early history of AMC and the origins of the takeover proposition, this article provides a detailed summary of GM's assessment of AMC's cars and plant. The causes of the breakdown of negotiations are then briefly discussed. Finally, we examine the implications of GM's plans for the merged GMUK-AMC and the British automobile sector.

## The Austin Motor Company

AMC's founder, chairman, and largest shareholder, Herbert Austin, was a trained engineer and a car design pioneer from the mid-1890s. Austin founded AMC in December 1905 in a disused printing works at Longbridge, Birmingham. By 1914, when AMC became a public company, capitalised at £650,000, it had a workforce of around 2,300.[9] AMC's workforce mushroomed to 20,000 during the First World War, on armaments contracts. However, logistical difficulties in converting back to civilian production after the War hampered the re-establishment of car production (compounded by the fact that Austin had patriotically taken on armaments contracts at very low tenders), precipitating a serious financial crisis during the 1920–1921 recession.

Following the establishment of a Creditors Committee, AMC was able to come out of receivership by the issue of £1.5 million debentures of three different kinds, to be repaid over five years. The deal also involved the appointment of three directors to represent the

creditors, two of whom played important roles in its turnaround. Carl R. F. Engelbach, a production engineer with experience of mass production methods, was appointed as works director, while Ernest L. Payton became AMC's financial director, following a conservative financial policy that kept the firm out of further trouble. The reconstruction left AMC with a reformed managerial structure and a more commercial orientation, but also created a heavy burden of fixed debt.[10]

AMC's recovery during the first half of the 1920s was based on the design and production of cheaper, more popular, models than the Austin 'Twenty' (representing its horsepower), their only production model in the immediate post-war period. The Austin Twelve was introduced in 1921, to appeal to the most popular class-size of the British market. This was followed by the more revolutionary Austin Seven in 1922, designed to extend the auto market to lower-middle class purchasers hitherto only served by the motorcycle with sidecar.[11] The appeal of small cars was boosted by a 1921 government decision to abolish petrol tax (reinstated in 1928), replacing it with a vehicle tax of £1 per unit of horsepower per annum. British producers responded by developing high compression engines, which enabled customers to economise on road tax while also differentiating British cars from their American counterparts in terms of size and engine characteristics—thus further increasing effective protection for the British industry.[12]

The Austin Twelve rapidly gained a reputation for appearance, comfort, and reliability, selling well despite a higher price than its direct competitors (owing to AMC's financial problems, which delayed cost-saving investment).[13] Meanwhile the Austin Seven soon proved itself in terms of performance and reliability, despite its unusually small size. Priced at £225 at its launch, this was progressively lowered to only £130 by 1929.[14] The Seven reaped much low cost publicity from its appeal to the sporting market, picking up numerous racing trophies.[15] This enhanced its social acceptability, an important factor for what was an unusually small car even by British standards.[16]

Production of the Seven was based on a strategy of high volumes and small profit margins (within the constraints of AMC's difficult financial circumstances). Unit costs were reduced by introducing the first British moving assembly lines for both chassis and car bodies. However, it proved difficult to keep some of the single-purpose machine tools fully employed, given production bottlenecks. In common with most European volume car manufacturers, Austin faced an imperative to adapt American production methods to smaller production runs.[17] In 1923 a £600,000 investment programme, to move to mass production, achieve more efficient use of labour, and reduce unit costs, cut the number of employees per car per week from 55 in 1922 to only 10 in 1927. Meanwhile the ratio of overhead charges to the cost of productive labour (expressed as a percentage) fell from 161 in 1924 to 96 in 1927.[18] Yet AMC's expansion plans continued to be plagued by capital constraints, despite predictions of effective demand that exceeded production targets.[19]

## Background to the takeover negotiations

GM was created by W.C. Durant, who acquired the failing Buick Motor Company and twenty-four other auto and accessories firms, capitalised at $10 million in 1908 as the General Motors Corporation.[20] However, Durant's failure to rationalise his acquisitions, or stabilise the finances of his holding company, led to his resignation in 1921.[21] Following Durant's resignation, GM was reconstituted under a plan developed by Alfred P. Sloan. Yet despite

pioneering the multidivisional structure and developing an innovative multi-model Fordist strategy (by sharing components), in 1925 GM was still running a poor second to Ford in the US market, with a 15.3 percent share, compared with Ford's 39.4 percent.[22]

GM's main European strategy during the early 1920s was to open assembly plants in key markets. This had several advantages, including identifying GM more closely with the nations in question, through using local management and labour. Local materials and components also reduced transport and tariff costs for 'knocked-down' exported cars. However, by the mid-1920s GM was considering becoming a car producer (rather than just an assembler) in major European markets, by acquiring leading local manufacturers. This policy was vigorously championed by James D. Mooney, the head of GM's export division from 1922–1941, though it did not command the universal support of the GM Executive Committee until the end of the 1920s.[23]

In spring 1925 Mooney visited a number of major European car firms, including AMC and Morris in Britain; Opel and Benz in Germany; Citroën, Renault, and Voisin in Paris; and Fiat in Italy.[24] Acquiring a British auto firm was a priority, as this would give them a stronger position in one of the largest overseas car markets (including preferential access to the British Empire); avoid the McKenna tariffs, which increased imported car prices by one third; and help develop smaller cars, more suitable to British and European roads and running costs—magnified by taxation systems that penalised cars with large engines. Acquiring a firm producing well-designed low-HP cars was thus particularly attractive.[25] Moreover, GM was looking for a strong British brand name. While Ford had expanded internationally under its own trademark, GM took a more low-profile approach, acquiring existing auto firms and retaining their brand identities, partly to gain social acceptance in the countries in question.[26]

Herbert Austin had instigated the takeover negotiations.[27] They built on earlier discussions in 1920 which had come to nothing—probably due to AMC's heavy debts, problems with reconverting to peacetime production, and the fact that they then had only a single car model.[28] Similarly, negotiations between GM and Citroën (which was seeking investment from a major US auto firm) in 1919 also failed, on account of what GM perceived to be its inadequate management; outdated factory; and French government hostility to American ownership.[29]

Austin's eagerness partly reflected his awareness of America's strong technical lead in mass production. In October 1922 he and Ernest Payton had visited the USA to discover how auto manufacturers were able to deliver cars from their works at prices roughly equal to what AMC paid for materials and accessories. They visited several major car manufacturers, including Ford and GM, together with components and tool producers. Austin was particularly impressed by Ford's River Rouge and Highland Park plants, noting the intensity of worker effort: 'The secret for obtaining this atmosphere… [is] no excess material between operations. Each operation is being pushed forward by the one behind and drawn forward by the one in front'.[30] Indeed, when GM evaluated Austin's plant three years later, one of the biggest inefficiencies they identified was material flow:

> It is almost impossible to describe the lack of organisation, tooling and production methods… I do not believe that the introduction of an assembly line, conveyor chain, progressive assembly and so forth alone would cure the situation. It is more deeply rooted than this… materials and material control… is not under control at the present time.[31]

## GM's assessment

On May 14th 1925 Herbert Austin sent GM a proposal for selling control of AMC.[32] Eleven days later Mooney submitted an extensive report on the proposed takeover, recommending acceptance.[33] The acquisition was seen as having the potential to transform GM's position in the British market. By 1925 roughly 40 percent of GM's overseas business was being done in the British Empire (excluding Canada), with 11 percent in the UK alone. Yet despite GM pricing the same Chevrolet at £155 that sold in the USA for $622 (£129), after transporting it 3,500 miles from the point of manufacture, it was only selling 6,000 Chevrolets and 4,000 Buicks in Britain, compared to sales of 45,000 cars by Morris; 20,000 by Austin; 9,000 by Standard and 8,000 by Clyno. GM attributed this to British cars being designed for the tastes of UK purchasers; lower taxation (owing to lower horsepower); Britain's traditional excellency of workmanship; light weight; and a greater variety of options regarding colours etc. AMC offered an opportunity to,

> get this British flavour into American cars such as Chevrolet, Buick, Oakland and, at the same time, capitalise the volume of our U.S. plants. By…allowing the Austin to add the British touch in such matters as seat angles, body trim, painting, etc.[34]

Mooney's report was very positive regarding AMC's cars. From the early 1920s GM's strategy to combat Ford's market dominance rested on two important ideas, developing a 'car for every purse and purpose' and achieving what Chandler later called 'economies of scope' by using common parts for a variety of products.[35] AMC could contribute to both these strategies. It produced three models that did not compete against each other and—in important respects—did not compete directly with existing GM models. Moreover, as discussed below, there were substantial opportunities for sharing parts within a combined GM-AMC model range.

Mooney noted that the design and engineering work on the Austin Seven,

> is most interesting and shows just what can be done to decrease weight and eliminate parts and still have a machine which will operate and carry passengers. It is rather a remarkable piece of engineering work… worth careful study from a design angle. It may or may not be worth consideration as a marketable car [internationally] along with the other General Motors cars.

However, Mooney had one objection, 'It approaches the ridiculous in size'.[36]

Mooney argued that Austin would have been wiser to have focussed more on the Austin Twelve, given the success of the 11.9 horsepower Morris Cowley:

> Had the time, energy and ability which went into the design and production of the Austin Seven… been devoted to developing a car which would have appealed to the buying public who patronise the Morris Cowley, the opportunity for increased volume would have been greatly enlarged.[37]

However, Mooney did not reject the small car market:

> There is no reason why a model between the seven h.p. and the twelve h.p. could not be introduced in the future—one which would definitely be produced to cater for the small car field now dominated by Morris and Citroën.[38]

The Austin Twelve was described as equivalent to a Dodge or Buick Four Cylinder, except that it had a small bore, long-stroke, high efficiency engine. Mooney noted that it was,

> well designed in all respects, has some interesting features, and is very well made…. It has a comparatively high initial selling price, and in this respect is out of its price class… This… has potential market possibilities and could fit in the proper price class without disturbing the sales of the other [GM] cars.[39]

In addition to discriminatory taxes against large cars, and higher petrol prices, in Britain and most European countries, Mooney noted that small cars were more suitable for European roads. Despite war-time under-investment, European drivers: 'do not know what a bad road is, as we have known bad roads in the United States, for instance… in the Middle West and Far West and South'.[40] The 'principal factor of resistance' to American-style cars in Europe was, 'the overall cost of motoring. The first cost of the vehicle is still entirely too high, and on top of that gasoline and repairs are excessively high….'[41]

Mooney also identified the Austin Twelve as being ideal for the British dominions, filling a market gap GM created when Buick Motor Co. abandoned its four-cylinder car (the only medium-price four cylinder model in their range), a decision which adversely affected exports. The Austin Twelve would be attractive to non-North American markets where, 'operation costs, gasoline and repairs are roughly twice as heavy as in the United States'.[42] These arguments were corroborated by AMC's export performance, especially during the Depression, when buyers turned to more economical cars.[43]

Mooney's views regarding the design excellence of the Austin Seven and Austin Twelve are corroborated by other contemporary, and historical, appraisals.[44] Mooney also stated that the Austin Twenty was well-designed and well made, being 'essentially a high grade, high priced car'.[45] Overall, Mooney concluded, 'The Austin car is typically British in design and workmanship… This gives it a strong identity as a British product and is a great factor in the reputation of the product with the British buying-public', a view shared by his GM UK staff. '[T]he total value relationship between the price and what the car-buyer gets for his money is greater than any other British made car'.[46]

Mooney was generally pleased with AMC, which he viewed as having, 'a rather good history of success, an excellent reputation in the market… a good name and history, excellent prestige… [and a] strong identification as a British Company making British Cars'.[47] Other positive factors included good production facilities; a well-located plant for production and distribution; reasonably good existing volume; and 400 British dealers (regarded as being of first-class quality).

Mooney was less positive regarding AMC's marketing. He noted that it had a very small sales organisation by US standards and a non-aggressive sales policy. 'They let the car sell on its reputation rather than by creating a demand', in contrast to Morris's more aggressive advertising and higher budgets.[48] AMC's UK selling organisation comprised three travelling men to keep touch with their 400 dealerships, selling 12,750 cars annually. The selling expense was only 0.71 percent of sales revenue and expenses for advertising, trials, exhibits, etc. 0.80 percent, with all selling and advertising expense totalling 1.51 percent of sales. For export sales AMC had three travelling men, though these were not exclusive to Austin.[49] However, AMC had arranged hire purchase credit for their dealerships from 1924, via United Dominions Trust.[50]

Mooney believed that GM could provide a stronger marketing organisation, with superior advertising and sales methods (including 'selling aggressiveness'); a world-wide dealer network; development finance; retail credit via General Motors Acceptance Corporation; and

'Technique and knowledge of production methods, tools, equipment, processes'.[51] He also perceived AMC to be 'weak' in mass production methods and that their cars were priced too high.[52]

Austin shared their concern regarding pricing. In correspondence with Mooney, he noted that while AMC was currently selling the Austin Seven at £149, reducing the price to £120 would boost sales from 200 to 500 per week: 'The present price puts it out of its proper market'.[53] Meanwhile if the price of the Austin 12 was reduced from its current (£355 with touring body) price to £300, 25,000 per annum could be sold (compared to 9,000 currently).

Mooney noted that a very large proportion of AMC's machine tools were American made and that the machine-shop and tool room were set up with modern machinery. However, 'While an attempt has been made at progressive assembly it is still weak and would need revision. Final assembly is in the same condition'.[54] Despite having a large number of American machines and tools, Mooney argued that they had not…

> capitalised their investment to its full extent, as they could have done had they also introduced more of the technique of American production methods. Generally their methods are slow—their work-manship good… Sir Herbert has been too much interested in the details of design and tooling, and has overlooked the weak points in his production. The possibilities of this plant are excellent… [with] proper management, methods, controls and so forth….[55]

The production budget for the year ending 30th September 1925 was for 15,750 vehicles, while capacity (given existing methods) was estimated at around 20,000. However, Mooney noted that capacity could be substantially increased without buying land or erecting many new buildings: 'The need is not for expansion in the sense of covering more space. There is plenty of space. The need is for better operating methods in the same space which will speed up production'.[56] He concluded that, 'by introducing better production methods, doing more purchasing outside, and putting more intensiveness into the sales programme, which has been entirely lacking in the Austin organisation… production… could be stepped up in two or three years to forty-thousand cars'.[57]

Mooney also discussed Austin's main rival, William Morris, who he was well acquainted with, describing him as:

> more of a commercial engineer. He really has many of the characteristics of an American so far as commercial aggressiveness and sense, in putting a thing on a production and aggressive sales basis…. He is a high-strung, nervous type, with a great amount of personal buoyancy and has been very keenly alive to all of the sales and advertising possibilities of putting his proposition across. He is perhaps the most aggressive motor car manufacturer from the sales end in Europe. He has been particularly keen on doing the little things, so far as the appearance and sense appeal of his car is concerned, that will put it across with the public. Examined critically, his car is not as good… as the Austin but he has done wonders in getting it in the market and selling it to the British public.[58]

In addition to aggressive use of consumer credit (said to finance 80 percent of Morris car sales),[59] Morris provided a year's free insurance and offered to erect garages for his customers, large enough to house the car, for £15—insuring a good deal of repeat business (as competitive cars were a good deal larger). Furthermore, his house journal for Morris owners, funded by advertising for accessory companies, was sufficiently popular to be sold in most UK newsstands.[60] Mooney also regarded Morris as an excellent production engineer:

> the best example in Europe of the proper balance between keeping the investment from going sky high, and on the other hand, in having the necessary tools and equipment to speed up production [when necessary]… Mr Morris… has spent some time in America and has taken a lot of advantage of American production ideas and methods… His case furnishes an interesting example of what can be done in Europe at the present time with proper management. He has proved that there is a demand in Europe for a low priced, low operation cost car, and he has proved that American production methods can greatly assist in producing such a car.[61]

Both AMC and Morris Motors were found to have an essentially similar fundamental managerial problem, operating in 'the shadow of the man in charge'.[62] AMC had:

> all of the forms of up-to-date, modern, scientific management but in the interpretation of doing these things there is evident weakness on the sides of production, sales and finance… Austin is primarily a mechanical man and an engineer… He understands production, sales and finance, but takes only… a secondary interest in them… the very things that are lacking in the Austin organization are the things that we could well supply through our skilled personnel… The organization and personnel reflect the fact that Sir Herbert has built up a "one-man" concern which depends upon him to take the lead. Apparently he has not given Heads of various Departments the necessary latitude to use their own initiative. Possessing as he does engineering ability, practically to the extent of genius, he… over-emphasises the engineering end of his business and places too little stress on the sales and other commercial activities. He is rather proud of the fact that he has a very limited sales organization, and that the selling expenses are abnormally low.[63]

These comments are corroborated by retrospective assessments, emphasising Austin's skills as an inventor and engineer, together with his unwillingness to invest sufficiently in marketing and his personal, autocratic, management style and refusal to delegate.[64] Mooney's depiction of both Austin and Morris is in line with Chandler's model of British 'personal capitalism', though this could equally be applied to many large US companies of this era, including Ford.[65]

Mooney concluded that while AMC had the better cars, Morris had,

> better production methods, better selling methods and better advertising and financing methods… With the Austin Car and its inherent good design and quality, and… [GM production and marketing] methods… we could in a comparatively short time put it up as very strong competition with the Morris.[66]

## *The failure of negotiations, the Vauxhall purchase, and its consequences*

On August 26th 1925 the outline takeover proposal was presented and approved by AMC's board, by a majority of five to three (the directors appointed by the Creditors Committee). GM's documentation hints at self-preservation being the main reason behind the three directors' objections, as—when the creditors were repaid in the post-merger financial reconstruction—they would have no claim to retain their board seats.[67] However Church has argued that their opposition reflected an optimistic view of the company's future.[68] This may be a fairer explanation, given that two of the dissenting directors—Engelbach and Payton—had played important roles in AMC's recovery from financial crisis. They also had specific responsibility for representing the creditors' interests—which would have been adversely affected by a write-down of AMC's assets (and the debentures secured on them).

GM was to purchase the 1,500,000 new £1 ordinary shares created for the reconstructed company, at par; £1,000,000 would be used to redeem all the outstanding debentures and

the balance for working capital.[69] GM's offer valued AMC at £3,707,970, some 25.96 percent lower than its 1925 book value, £5,007,850. This represented a substantial write-down of the firm's fixed assets (land, buildings, plant, machinery, etc.), partially compensated by raising the amount for 'goodwill and patents' from £281,122 to £677,496.[70] The stock-holders therefore faced substantial losses.

The original terms were regarded as a good deal by E.C. Riley, the head of GM's British operation. He had argued that the real value of the stock was determined by the company's earning potential, predicated on the possibilities for future earnings. An investigation of the earning potential of the merged GMUK-AMC appeared, 'to offer a value… quite distinct… from the value that an Auditor might place on the properties were he to merely audit the present book values of the various asset accounts….'[71] This value, outlined in Table 3 and Figure 1, below, was considerably larger. However, Herbert Austin had already agreed the takeover price with GM, who were not prepared to renegotiate what they regarded as a done deal. This may explain the absence of any discussions regarding the possibility of improving the offer in GM's extensive documentation.

On 29th August a resolution was passed by the AMC directors to refer the proposition to the stockholders.[72] There followed a vigorous publicity campaign against the takeover, allegedly led by the dissenting directors, which included briefing their largest dealers that things would be more difficult for them under the GM regime. Shortly afterwards GM withdrew from negotiations, formally in frustration at the dissenting directors' objections to the asset write-down.

Sloan later concurred that the principal reason for withdrawing was AMC's alleged over-valuation of their assets. He also claimed to have been relieved, given the weaknesses of AMC's plant and management; though the contrast with this statement and the contemporary documentation suggests that Sloan may have been making a retrospective justification of what turned out to have been a bad business decision.[73] Kuhn argued that it was only in the late 1920s that Sloan and his top management team seriously considered developing fully-integrated overseas plants, in response to the growing problem of divergent domestic and overseas marketing environments. Even then policy was tempered by fears that foreign ventures might overstretch their supply of experienced managerial and engineering personnel—a problem only partially solved by their strategy of purchasing leading auto firms in their main European markets.[74] In the mid-1920s support for such a policy appears to have been much weaker, with Sloan later claiming to have been one of the sceptics.[75] Moreover, the heated controversy the takeover battle had generated (reaching both the local and national press) may have tarnished the appeal of an acquisition designed, in part, to obtain a strong British brand name.[76]

AMC's subsequent record largely exonerates the view of the dissenting directors that the deal under-valued AMC. In 1925 AMC had a British market share, by volume, of around 10 percent, with an output of 13,250 vehicles. Two years later it had increased production to 38,000 vehicles (23 percent of British output by volume) and reached 43,638 (25.7 percent) by 1928, despite its continuing capital problems.[77] Moreover, its subsequent profit record was also strong. According to Church's calculations, profits (after maintenance, depreciation, taxes, and debenture interest) varied from 21–30 percent of paid up capital over 1929–1937. Net trading profit as a percentage of sales was lower, but still attractive, varying from 8.7 percent to 15.0 percent over the same period.[78]

Later in 1925 GM purchased another British car manufacturer, Vauxhall Motors Ltd, but this was a much smaller company, then producing 1,500 relatively large, expensive, cars per year. As Sloan recalled, 'It was in no sense a substitute for Austin; indeed, I looked on it only as an experiment in overseas manufacturing'.[79] It has also been suggested that the acquisition may have been motivated by a wish to gain political influence in Britain, to counter the threat of further adverse government measures, such as higher taxation or tariffs.[80] Vauxhall's models were unsuitable for the volume market, while vigorous enthusiasts' support for maintaining the integrity of this prestigious British sports car marque made it difficult to rapidly shift to smaller cars without generating public controversy. Its eventual turnaround in the 1930s followed a decision to introduce substantially smaller models.[81] Even then, Vauxhall was still positioned as a relatively prestigious brand, limiting its market, and remained the junior member of the Big Six British volume car makers, with an average 1930–1938 market share of only 6.4 percent, compared to Austin's 23.1 percent and Morris's 26.7 percent.[82]

In March 1929 GM acquired another European automobile firm, Opel, which then accounted for 44 percent of the German market. Under GM Opel experienced both rapid output growth and product and process innovation. However, judging GM's success in transferring its competencies to Opel is problematic, owing to the Great Depression (which paradoxically boosted Opel exports, owing to a switch in demand towards smaller cars), followed by a rapid loss of GM control under the Third Reich—including substantial government subsidies for its exports, to obtain hard currency in the run up to war.[83]

## *GM's plans for AMC*

GM's documentation includes detailed plans for the post-merger entity. Austin would continue as chairman, but relinquish executive control to E.C. Riley, who would become Managing Director.[84] GM planned to bring over specialists in mass production to assist AMC's switch to American methods—'staff men attached but not assigned to the Austin proposition. Naturally they will come over here for rather indefinite stays… but… Austin Company really will be operated by British executives'.[85] This mirrors the policy GM applied to Vauxhall and Opel.[86]

As noted by James Foreman-Peck, the main advantage US auto multinationals with superior technology and know-how enjoyed, when acquiring overseas firms, stemmed from their ability to transfer assets to their acquisitions without market transactions.[87] Particularly in the case of tacit know-how, market transactions face severe problems, owing to inadequate property rights and difficulties in estimating its value prior to transmission. GM had identified areas for knowledge transfer, both regarding technological and managerial know-how and the generation of synergies between AMC and GM's British operation. GM would transfer its Hendon assembly plant to Longbridge, which had a suitable empty building. GM also noted that AMC would solve GM's problems in getting spare parts to Britain and Europe. 'There is every facility at the Austin plant to completely manufacture spare parts, castings, forgings, sheet metal….'[88]

Further projected benefits from the increased scale of an integrated GMUK-AMC included the opening of a Fisher Body (a GM subsidiary) plant, under the control of the British subsidiary, that could greatly assist UK marketing of GM cars by eliminating expensive shipping charges for car bodies and allow GM to cater for details of body design and finish demanded locally.[89] Meanwhile those components which required highly-specialised tools and expensive dies, for example body panels, could be shipped 'knocked-down', for assembly at

Longbridge. There were also prospects for using Austin small-bore engines for locally assembled Chevrolets and Oldsmobiles, to reduce running costs to European levels. Mooney also noted that AMC's dealership network—which they rated as excellent—could be used to sell GM cars in addition to Austins. This would also allow GM to reduce their dealer discount from 22.5 percent (partly reflecting the limited market for American car models in Britain) to 17.5 percent, enabling further price reductions.[90]

Table 1 summarises the synergistic benefits from the merger, based on current outputs. Amalgamation was expected to boost the weighted average of GM's and Austin's profits (12.4 percent) to 16.1 percent. Moreover, as shown in Table 2, the merger was expected to raise GM UK's output of American models from a projected 1929 figure of 20,000 to 35,000 cars, while increasing total GM 'exports' (cars sold outside the USA) from 137,000 to 155,000. The analysis also forecast that AMC might increase production to 51,000 cars by 1929 with the merger, compared to 32,000 in its absence. These projections appear conservative, given that, despite the merger not going ahead, AMC nevertheless achieved 1929 sales of 46,562, much closer to the merger projection than the non-merger estimate.[91]

However, the main gains were dynamic, flowing from the synergies between economies of scale, scope, and throughput that would enable the merged company to simultaneously reduce prices and raise profit rates. Figure 1 and Table 3 show the estimated relationship between volume, costs and profits for the combined GMUK-AMC. Figure 1's vertical axis plots costs and profits and the horizontal scale shows sales. Point C on the horizontal axis represents AMC's estimated 1925 output, with a profit of 13.7 percent of total sales, and Point D represents GMUK-AMC output when merged. Moving from Points C to D was estimated to leave overheads and commercial expenses, together with chassis and body material costs, unchanged—owing to better control of overheads, utilising an existing vacant building, and more efficient production planning.

Table 3 shows the distribution of projected costs, revenue, and profits at point D, (£7,419,044 output) and the impacts of a 20 percent cut in prices to raise output to £20,000,000 sales (Point F, 2.7 times the combined volumes of the two companies). Raising production to point F would allow a 20 percent price cut, while still having a higher profit margin (21.2 percent) than point D (16.1 percent). General Motors Acceptance Corporation financing and increased AMC exports (owing to representation through the General Motors Export Organisation), would further increase volume. Meanwhile GM sales would also expand, as their cars' external designs would be modified at Longbridge to appeal to the UK market. For example, British Chevrolet bodies were already grooved in, but this could also be applied to Buick and Oldsmobile. Lower freight and packing charges would also help reduce prices.[92]

Column 6 of Table 3 shows production costs at this new volume, assuming no scale economies, and column 7 shows the economies available from increased throughput, higher efficiency, and better methods. A 10 percent saving in AMC chassis material would be achieved mainly through larger contracts, better sources, and substituting GM-built accessories and cheaper materials (without impairing quality). A 30 percent reduction in AMC body material costs would be gained through similar savings, including using steel rather than aluminium. However, the largest saving was a 60 per cent reduction in AMC body labour costs. Currently AMC bodies cost more than their chassis, a situation Riley found 'almost impossible to conceive of…'[93]

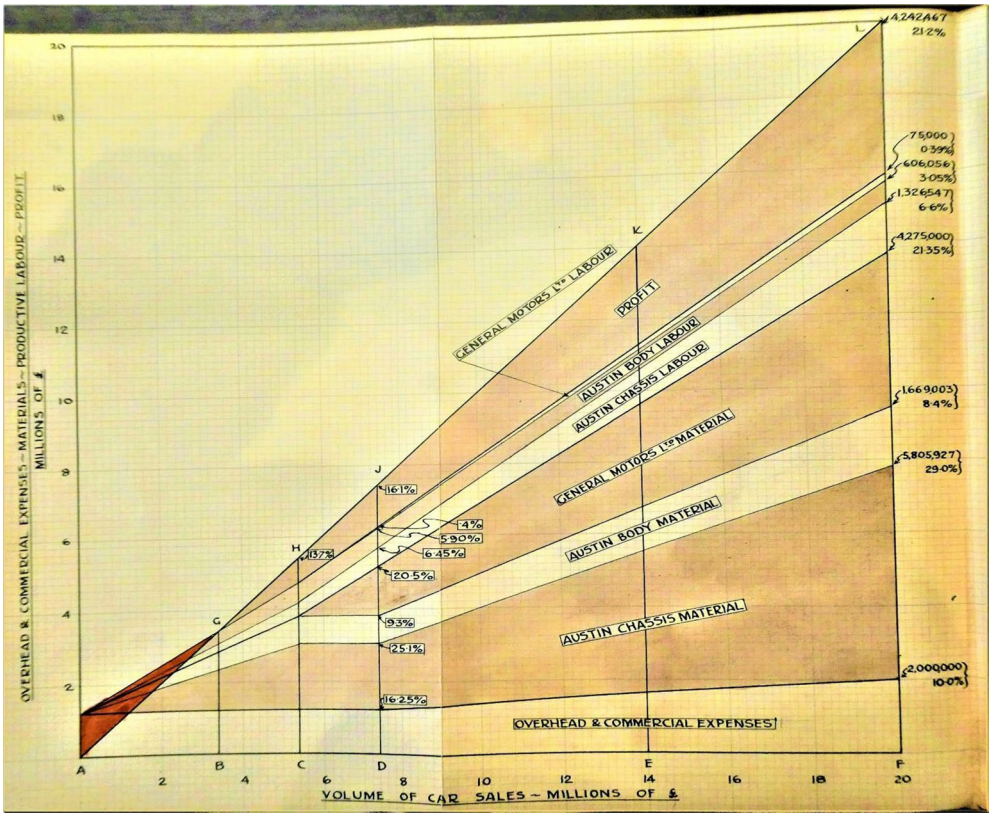


**Figure 1.** The relationship between output and costs/profits for the proposed GM-AMC company (for sources and notes, see Table 3).

**Table 1.** Sales and profits for AMC and GM before and (projected) after amalgamation.

| | Austin | GM Ltd | Total (before merger) | Total (after merger) |
|---|---|---|---|---|
| Turnover (£) | 5,419,044 | 2,000,000 | 7,419,044 | 7,419,044 |
| Profit (£) | 742,554 | 180,000 | 922,554 | 1,192,554 |
| Profit (percent) | 13.7 | 9.0 | 12.4 | 16.1 |

Source: Kettering, GM, Austin Motors files, Vol 2, Report of E.C. Riley, GM Ltd, on the Austin Motor Company, 18 Aug. 1925, Section 3.

**Table 2.** Previous and projected sales of GM (export) and AMC, by volume, with and without the merger.

| | General Motors Corporation | | | | Austin Motor Co. | |
|---|---|---|---|---|---|---|
| | UK sales | | Total export sales | | | |
| Year | No merger | Merger | No merger | Merger | No merger | Merger |
| 1922 | 4,802 | | 15,889 | | 2,559 | |
| 1923 | 7,063 | | 45,041 | | 6,417 | |
| 1924 | 8,011 | | 65,048 | | 11,880 | |
| 1925 | 9,250 | 9,250 | 84,500 | 84,500 | 20,000 | 20,000 |
| 1926 | 13,000 | 16,000 | 103,000 | 107,000 | 24,000 | 30,000 |
| 1927 | 16,000 | 24,000 | 117,000 | 127,000 | 27,000 | 38,000 |
| 1928 | 18,000 | 30,000 | 128,000 | 143,000 | 30,000 | 45,000 |
| 1929 | 20,000 | 35,000 | 137,000 | 155,000 | 32,000 | 51,000 |

Source: Kettering, GM, Austin Motors files, Vol 1, Section 1b, supplementary report, n.d., 1925; Vol 1, Section 3, negotiating memoranda, 'Notes on A.M. Company and X Company', 15 August 1925; Volume 2, Section 3A, memo beginning 'Some substantiating reasoning…'.

Notes: 1922–1924 figures for AMC do not include a small number of tractors and commercial vehicles. GM sales are for their US models.

**Table 3.** GM-AMC merger: projected changes in costs and profits from moving from volume 'D' to volume 'F'.

| | At volume 'D' | | Increase in costs at 'F' | | Col. 5 marked up 25%. | % reduction | Col. 6 marked down by % in Col. 7, condition at column F | |
|---|---|---|---|---|---|---|---|---|
| Item | £ | % sales | Multiple | £ | Account 20% price cut | possible | £ | % sales |
| **Overhead & commercial costs** | 1,208,288 | 16.3 | | | | | 2,000,000 | 10.0 |
| Austin chassis material | 1,863,114 | 25.1 | 2.77 | 5,160,825 | 6,451,029 | 10 | 5,805,927 | 29.0 |
| Austin body material | 688,604 | 9.3 | 2.77 | 1,907,432 | 2,384,290 | 30 | 1,669,003 | 8.3 |
| Total Austin material | 2,551,718 | 34.4 | 2.77 | 3,800,000 | 4,750,000 | 10 | 7,474,930 | 37.4 |
| GMC material | 1,520,000 | 20.5 | 2.50 | | | | 4,275,000 | 21.4 |
| **Grand total material** | 4,071,718 | 54.9 | | | | | 11,749,930 | 58.7 |
| Austin chassis labour | 478,898 | 6.5 | 2.77 | 1,326,547 | 1,658,184 | 20 | 1,326,547 | 6.6 |
| Austin body labour | 437,586 | 5.9 | 2.77 | 1,212,113 | 1,515,141 | 60 | 606,056 | 3.0 |
| Total Austin labour | 916,484 | 12.4 | 2.77 | | | | 1,932,603 | 9.7 |
| GMC labour | 30,000 | 0.4 | 2.50 | 75,000 | 93,750 | 20 | 75,000 | 0.4 |
| **Grand total labour** | 946,484 | 12.8 | | | | | 2,007,603 | 10.0 |
| **Total expenses** | 6,226,490 | 83.9 | | | | | 15,757,533 | 78.8 |
| **Profit** | 1,192,554 | 16.1 | | | | | 4,242,467 | 21.2 |
| **Total revenue** | 7,419,044 | 100.0 | | | | | 20,000,000 | 100.0 |

Note: said to be based on very conservative assumptions.
Based on prices being reduced by 20% at point F.
See Plate 1.
Kettering, GM, Austin Motors files, Vol 1, Section 3, negotiating memoranda, 'Notes on AM Company and X Company (GM UK)', 15 August 1925.

It is important to note that projections of much higher sales, flowing from price reductions, were based on gaining market share, rather than expanding the aggregate market (something that would have been much more problematic to forecast, given that the main barrier to British car diffusion was running costs).[94] The proposed price reduction was designed to make it very difficult for competitors to match prices and still cover costs. Britain's best-selling car, the Morris Cowley, had a list price for the touring model of £195. Deducting the £7 free first year insurance cost (provided with the car) the price would be £188. With the deduction of the 15 percent dealer discount, each car provided Morris with a revenue of £160.20. Reducing their price by 20 percent to match AMC would thus decrease revenue per car by £32.04. Riley stated that this figure roughly equated to the average profit on Morris's car sales, while other British volume car producers had smaller volumes and, therefore, profit margins. Estimated profits at £20 million volume amounted to 21.2 percent on sales, based on a ratio of capital turnover of 1.88. This would require an invested capital of £20,000,000/1.88, i.e. £10,638,000, compared to the current capital employed by Austin and GMUK (£3,741,099).[95] The relatively rapid growth of the UK car market, from 132,000 cars in 1925 to 182,347 in 1929 and 389,633 in 1937, would have boosted the effectiveness of GM's strategy (as would any impact of their low-price strategy on further boosting aggregate market growth).[96]

However, economies of scale represented only one factor that constituted the 'assemblage' of competitive advantages provided by the amalgamation—magnifying the effectiveness of each individual element. The other two key elements were the attractiveness of the AMC car models for British, European, and Empire markets, and GM's expertise in mass-production, particularly regarding what Chandler termed 'economies of throughput'—running the production system at capacity utilisation and thereby avoiding the potentially severe cost penalties of high fixed costs at lower outputs.[97] A key element of Fordism, lacking in the British-owned firms, was 'flow production', to ensure that all activities along the assembly line ran at a co-ordinated, pre-determined, speed.[98] Such a system would remove the production bottlenecks Austin had been experiencing. This, in turn, would require a shift from piece-work remuneration (used by almost all British-owned car firms), which gave workers an element of discretion and lacked coordination, to an hourly wage system, as used by Ford and GM.[99]

Riley noted that the above calculations implied that the scope for improving sales and profits was magnified by AMC's, 'lack of knowledge of how to manufacture', evidenced by AMC's extraordinarily high body costs, thereby increasing the added value of GM to AMC to a point where its value was above that of either GM's accounting depreciation figure and, possibly, of AMC's book value.[100] This implied that the value of AMC was greater for GM than for any other company, as GM had:

> the necessary resources, in management, experience, policies, men, capital distributing organization in world markets, accessory units, and research… It is only in General Motors that we have the 'know how' … which would enable us to fully capitalize the opportunity for improvement afforded… For the 18,086 jobs [for 1925] which Austin built complete, both chassis and body, we encountered a total chassis labour cost of £432,875 and a total body labour cost of £437,586. In other words, slightly more than 50% of the Austin total productive labour has been expended in the construction of the bodies. This is, of course, out of all proportion.[101]

Thus the key problem was not machinery, or even scale, but production 'know how', to establish an optimised, co-ordinated, production line. Setting up such a system was a skilled

and complex task, involving setting practicable standard outputs for each process, as evidenced by Ford's extensive experimenting before consistently predictable output levels were achieved.[102] However, Riley noted that the necessary improvements could be introduced with a relatively small capital investment.

> The biggest thing required is the knowledge, which the Corporation has at its command. With a moderate amount of capital investment and up-to-date kiln systems, wood mill, sheet metal department assembly line, Duco shop, cutting and sewing room and trim section installed, a very large saving can be effected out of all proportion to the capital invested.[103]

### *The implications of a GM takeover of AMC*

GM had agreed to invest £1,500,000 in AMC (£86,180,000 in 2019 prices); a sufficient sum to make them committed to its success—and to Riley's plans.[104] Their aggressive price-cutting strategy would have made it very difficult for smaller volume car manufacturers to survive, thus creating a more concentrated automobile sector than the 'Big Six' of the 1930s—an unusually fragmented structure, compared to both the USA and major European car-producing nations.[105]

The period 1925–1930 has been identified as a key transition in the history of the British motor vehicle industry, as falling prices threatened a major 'shake-out' of less efficient firms and the shift to all-metal bodies substantially raised capital costs and optimal plant size. The US firm Edward G. Budd Manufacturing Co. had sought to licence its all-body steel technology to European firms—in France (Citroën); Germany; and in Britain, via Morris Motors, with the creation of the Pressed Steel Company in 1926.[106] However, there were other technological routes to achieving all-steel bodies and over the two years to May 1929 the proportion of new British private cars with closed-tops almost doubled from 41.87 to 82.12 per cent.[107]

In 1930 Morris severed its links with the Pressed Steel Company, enabling it to supply other British manufacturers; thereby reducing entry barriers to all-steel body technology.[108] Nevertheless the move to all-steel bodies incurred considerable capital costs, creating substantial barriers to exit for the firms that made the transition. Moreover, the cost penalties of sub-optimal output were eroded by a strong third-party components industry. Car manufacturers thus turned to non-price competition and price collusion, which safeguarded sunk costs but reduced competitive pressures.[109]

Reducing prices in the mid-1920s on the scale proposed by Riley would have reduced unit prices to levels that would have made Rootes' move into car production in 1928 uneconomic and blocked Standard's emergence as a significant producer, while accelerating Singer's decline.[110] The fate of Morris Motors is more problematic. By the 1930s Morris was paying increasing attention to his philanthropic interests rather than car production, but nevertheless continually intervened in company policies, often with negative consequences.[111] However, strong price competition from AMC may have produced a vigorous entrepreneurial response, especially given that in 1925 most of his wealth was still tied up in his company (he later removed an estimated £2,127,000 over the 1928/9-1932/3 tax years, tax-free, by taking the income as capital gains).[112]

GMUK-AMC would also have been in a relatively strong position regarding Ford, as GM's marketing strategy was based on market segmentation rather than a single-model strategy. This was particularly important for Britain, given that many people purchased cars primarily for their leisure, amenity, and status value, rather than as a 'work-horse', owing to Britain's

much better roads, denser public transport systems, and shorter journeys, than the USA, or even France. However, an aggressive GM-AMC may well have accelerated Ford's introduction of purpose-built small cars for the European market. The fundamental importance of smaller cars to Ford's success in the British market is demonstrated by its introduction of the Ford 8 in 1932—the first successful instance of an American firm producing a European-type car—which raised Ford's market share from a mere 2.4 percent in 1931 to 13.2 percent in 1933.[113] Such pro-competitive moves would further squeeze the British-owned car manufacturers.

However, it is unlikely that a merged GM-AMC would have substantially accelerated Britain's diffusion of automobiles, that reached only 15.4 percent of UK households in 1938, compared to about 44 percent for the USA in the mid-1930s. High British costs for petrol, road taxation, insurance, maintenance, and garaging made even second-hand cars prohibitively expensive for most households, while a well-developed public transport system made cars unnecessary for most work commuting.[114] Nevertheless, British car output would probably have grown substantially faster, given GM's plans for using Britain as a base for exports to Europe and the British dominions (excluding Canada)—especially if Ford UK accelerated their shift to smaller cars in response. When Ford and GM eventually embraced special models for the British and European markets in the 1930s, they were typically much better received than their US models, substantially raising market share.[115]

A volume car market composed of GM-AMC, Ford and perhaps Morris would also have considerably ameliorated the problems of the post-1945 British auto industry. Rhys has convincingly argued that the shake-out of smaller companies in the 1920s did not go far enough, with negative implications for the British industry's subsequent development both in the 1930s and the post-war decades.[116] The relative decline of Morris and Austin from the late 1920s—generally ascribed to their founders' waning interest in their firms—left space for other manufacturers to gain market share, leading to the oligopoly structure of the Big Six, with the more efficient members preferring higher profit rates to potentially protracted price wars and the rest being content with survival, given their heavy sunk costs.

The Big Six structure survived into the 1950s, only slowly consolidating into a 'Big Four' by 1970.[117] This left a legacy of excessive numbers of plants and a persistent failure to achieve minimum efficient scale, for either models or plants. A more thorough shake-out in the second half of the 1920s, into a two or three firm volume industry, would have reduced these problems and left the bulk of the British auto industry managed by its international leaders—GM and Ford. Meanwhile the international dollar shortage would have strongly incentivised them to serve export markets from Britain, rather than America, in the early post-war era.

## Conclusions

GM's documentation regarding the abortive AMC takeover indicates that AMC had the right cars for the British market and a plant that could absorb GM's leading-edge production technology, (constituting not only machine tools and production lines but, more fundamentally, mass production 'know-how'). Moreover, the records reveal that GM was planning an aggressive pricing strategy for AMC, designed to eradicate the profits of even the British market leader, Morris Motors, if it followed suit. Had these plans gone ahead, the most probable scenario would have been the creation of a much more concentrated industry, of two or three volume producers, which would have tempered the problems of excess capacity and sub-optimal plant and firm concentration, that persisted well into the post-war era.[118]

The analysis also highlights the strongly path-dependent nature of industrial evolution, especially in sectors subject to high granularity, increasing returns, and substantial inter-firm differences in technological know-how and intellectual property. While the road that GM did not take can never be charted with accuracy, their detailed plans for a merged GMUK-AMC, seeking market domination through a combination of American production technology and smaller cars, would most likely have produced a substantially more concentrated and efficient volume car industry. Instead, during the crucial period of rising capital costs and optimum plant size, the two market leaders—Morris Motors and AMC—gradually fell into decline (reflecting the waning interest and acumen of their very personally-managing founders), allowing competitors to develop entrenched positions by the 1930s.

Finally, the GM documentation sheds important light on the nature of auto mass production during the 1920s and the factors underlying Britain's (and Europe's) inter-war productivity gap with the United States. Scale, conveyor systems, and machine tools were important components, but formed only parts of efficient mass production systems. Another key component was less tangible—mass production 'know-how'—the ability to operate production processes at capacity throughput. This in turn was vital to realising the full potential for economies of scale and scope at any given output. It was this element that Mooney, Riley and Austin all recognised as being under-developed in AMC and, unlike tangible knowledge—transmitted via machinery purchases and blueprints—was best transferred via managerial personnel embodying the essential tacit knowledge.

## Disclosure statement

No potential conflict of interest was reported by the author.

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108. James Foreman-Peck, Sue Bowden, and Alan McKinlay, *The British Motor Industry* (Manchester, 1995), 57.
109. Modern Records Centre, Coventry, Austin Motor Co. archives, 226/AU/1/12, board minutes, 26th July 1933.
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112. Church, *Herbert Austin*, 177–183; The National Archives, IR 64/51, report for Mr Oliver, signed W.E.B., 14 April 1934.
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114. For contemporary estimates, see Scott, *Market Makers*, 281–287.
115. Foreman-Peck, 'American Challenge', 876.
116. Rhys, 'Concentration'.
117. Foreman-Peck, Bowden, and McKinlay, *British Motor Industry*, 43.
118. Foreman-Peck, Bowden, and McKinlay, *British Motor Industry*, 89–216.

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