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Universal banks and German industrialization: a reappraisal

By JEREMY EDWARDS and SHEILAGH OGILVIE

Close relationships between universal banks and industrial companies are widely regarded as a distinctive feature of the German economy, and as having played an important part in German industrialization. This view has a long history, dating back to Jeidels, Riesser, and Hilferding.² Perhaps its most influential exponent was Gerschenkron, who incorporated the supposedly crucial role of universal banks in German industrialization into his analysis of the contribution of different institutions to industrialization in backward economies.³ Gerschenkron's argument is echoed in many more recent discussions of the contribution of systems of investment finance to economic growth. Kennedy argues that the failure of British financial intermediaries to behave as German universal banks did, hampered British economic performance in the late nineteenth and early twentieth centuries.⁴ Calomiris compares the American and German systems of investment between 1870 and 1914, and concludes that the German system was superior.⁵ Baliga and Polak take the importance of universal banks in German industrialization as a central fact to be explained by their theory of comparative financial institutions.⁶ The view that Germany exemplifies the 'bank-based' system of investment finance, which is superior to alternative systems, in particular the 'market-based' Anglo-American system, is commonly encountered not only in historical analyses, but also in current policy debates, especially those concerning former centrally planned economies.⁷

Despite some questioning of this view—for example, by Neuburger and Stokes⁸ (whose arguments were strongly criticized⁹), Cassis,¹⁰ and Fohlin¹¹—the major role played by universal banks remains a central component of most accounts of German economic development. A recent proponent of the orthodox view is Chandler, who states that in Germany, the universal

¹ For helpful comments and discussions we would like to thank Sandeep Baliga, Forrest Capie, Klaus Fischer, Tim Guinnane, Leslie Hannah, Geoff Harcourt, Sara Horrell, Ajit Karnik, Peter Mathias, Colin Mayer, Marcus Nibler, Ben Polak, Bernhard Stier, Ben Tipton, Hans-Joachim Voth, Tony Wrigley, and anonymous referees.

² Jeidels, *Verhältnis*; Riesser, *Great banks*; Hilferding, *Finanzkapital*.

³ Gerschenkron, 'Economic backwardness'.

⁴ Kennedy, *Industrial structure*.

⁵ Calomiris, 'Costs'.

⁶ S. Baliga and B. Polak, 'Banks versus bonds: a simple theory of comparative financial institutions' (Cowles Foundation discussion paper, Yale Univ., 1995).

⁷ Crafts, 'Productivity growth', p. 409; Frydman *et al.*, 'Needed mechanisms'.

⁸ Neuburger and Stokes, 'German banks'.

⁹ Fremdling and Tilly, 'German banks'; Komlos, 'Kreditbanken'.

¹⁰ Cassis, 'British finance', pp. 8–10.

¹¹ C. M. Fohlin, 'Relationship banking and firm liquidity constraints: evidence from the heyday of the German universal banks' (unpub. working paper, California Institute of Technology, 1994).

banks 'were the instruments that made possible the rapid accumulation of capital on a scale vast enough to finance the building of the new continental transportation and communication infrastructure',¹² and that 'even more than they had done with railroad companies, these banks provided initial capital for new industrial ventures and helped guide them through their early years of growth'.¹³

Since this view is a crucial component of economic historians' interpretation of the industrialization process in different countries, and since it also exerts a significant influence on current policy debates, it is important to analyse its empirical basis. This article examines the available evidence, and argues that the conventional view needs reappraisal.

I

As its name suggests, a universal bank is one which engages in all forms of banking business: all the activities comprising commercial banking (holding deposit accounts, extending overdrafts on current account as well as making longer-term loans, and undertaking discounting business); and all forms of investment banking (issuing shares and debentures, trading in securities, and floating loans for governments and municipalities). However, the argument that universal banks played a central role in German industrialization is based not just on their universal nature, but also on a distinctive German institutional feature: banks' representation on the supervisory boards of joint-stock companies.¹⁴ From 1870, German company law required every joint-stock company to have a supervisory board, whose main function was to supervise the board of senior managers responsible for the company's operation. German universal banks were represented on supervisory boards because they controlled equity voting rights, either through owning shares themselves, or through exercising proxy votes for shareholders who had deposited shares with them.

German universal banks supplied external finance to companies in two major forms: current account credit, and organization of issues of new securities (particularly shares). A current account relationship between a bank and a firm involved claims arising on both sides; the balance of this account was struck periodically, but either party had the right to close the account and demand payment at any time.¹⁵ Current account advances from banks to firms were short term, but could be renewed so as effectively to provide longer-term finance. By the nature of the current account relationship, however, a firm stood in credit with its bank at some periods, and in debt at others.

¹² Chandler, *Scale*, p. 416.

¹³ *Ibid.*, p. 417.

¹⁴ We use the term joint-stock company to refer to the German *Aktiengesellschaft*. The essential feature of the joint-stock company as an enterprise form is that it can issue, for public subscription, shares which are legal evidence of ownership. It is therefore a public, as opposed to a private, company. A private company has limited liability for its owners, but cannot offer shares for public subscription, and typically has restrictions on the transferability of ownership.

¹⁵ Barrett Whale, *Joint stock banking*, pp. 37-8.

Security issues on the stock market were the primary form in which joint-stock companies raised long-term external finance for investment. The investment banking business of universal banks involved helping joint-stock companies to issue shares and debentures: indeed, a German company could not issue securities on the stock market without the intermediation of a universal bank. The universal bank would take the securities into its own portfolio in the first instance, and subsequently place the shares with the final investors.¹⁶ But universal banks did not typically hold shares in joint-stock companies themselves. Although some of the first German universal banks did invest their own capital in permanent shareholdings in joint-stock companies, and also took the initiative in founding these companies, this was a feature largely restricted to the earlier period of German industrialization.¹⁷ The severe economic downswing of 1873-9 greatly reduced companies' share values, forcing many universal banks to write down their own capital. This experience led all German universal banks from the 1880s onwards to avoid direct shareholdings in firms, retaining shares in their own portfolios only when these could not be disposed of without large losses.¹⁸ Over the entire period of German industrialization, external finance supplied to joint-stock companies in the form of direct shareholdings by universal banks was not significant when compared with current account loans and organization of security issues.

Why are universal banks with representation on supervisory boards of joint-stock companies regarded as having made such an important contribution to German industrialization? Briefly put, the argument is that these distinctive features of the German system of investment finance are the best way of dealing with the problems of asymmetric information which are inevitable when investment has to be financed by external sources of funds. A system of investment finance acts as a mechanism for savers to provide resources to investors with more productive uses for them. Typically, these investors are firms. Asymmetries of information are inherent in the provision of external finance to firms, because savers are entrusting resources to firms about which they have limited information, and it is costly for savers to monitor the firm's managers. There is no guarantee that, once a firm has obtained external finance, its managers will act in accordance with the interests of suppliers of finance. Managers may, for example, use external finance to invest in projects which are not profitable but boost their own status; or they may use it to provide themselves with perquisites. If suppliers of external finance do not have the information to prevent managers from pursuing their own interests at savers' expense, or to be able to distinguish between good and bad managers, the supply of external finance will be restricted, and firms with worthwhile investment projects will be unable to raise funds for them.

External finance for investment is supposed to have been particularly important for German industrialization because Germany was relatively

¹⁶ *Ibid.*, pp. 39-46.

¹⁷ Born, *International banking*, p. 89; Feldenkirchen, 'Banking', pp. 120-1.

¹⁸ Feldenkirchen, 'Banking', p. 129.

backward, and lacked enterprises with enough internal resources to finance rapid establishment of large-scale, capital-intensive industry.¹⁹ It is claimed that the universal nature of German banks, together with their representation on joint-stock companies' supervisory boards, allowed them to economize on costs of solving problems of asymmetric information. This is based on two main lines of argument.

One is that the universal nature of German banks improved the supply of external finance to joint-stock companies in the form of security issues on the stock market. A universal bank would both have a current account relationship with the company, and organize its security issues. Current account transactions provided the bank with information about the company's soundness and hence its suitability for making a security issue. In contrast with a system in which different financial institutions specialize in commercial and investment banking, universal banks have better information for screening firms wishing to issue shares: this prevents bad companies driving out good ones, thereby inhibiting the supply of this type of external finance.²⁰

The second argument is that the representation of German universal banks on supervisory boards gave them information about, and control over, companies' managers. This made German universal banks much more willing to supply external finance than were banks in economies without such a significant bank role in corporate governance. This argument has three separate strands. First, modern theories of corporate finance argue that the supply of external finance will be increased if suppliers have some control over the behaviour of firms.²¹ A second strand sees German bank representatives on companies' supervisory boards performing an entrepreneurial role, rationalizing industrial structure by organizing mergers and cartels which increased companies' profitability, and hence the attractiveness of supplying external finance.²² A third regards supervisory board representation as enabling German banks to improve information flows within the economy, creating a better allocation of investment funds.²³

These arguments about the important role of universal banks in German industrialization are all based on the premise that the German system of investment finance in this period was indeed one in which universal banks with close ties to industrial companies supplied significant amounts of external funds for industrial investment. But is this premise correct?

II

How important were the universal banks in the overall German financial system? The most comprehensive data available for German industrialization are Goldsmith's estimates of the share of different types of financial institution

¹⁹ Gerschenkron, 'Economic backwardness', p. 14.

²⁰ Jeidels, *Verhältnis*, p. 33; Barrett Whale, *Joint stock banking*, pp. 326-7; Kennedy, *Industrial structure*.

²¹ Stiglitz, 'Credit markets'.

²² Best and Humphries, 'City'.

²³ James, 'Banks', pp. 116-7.

in the total assets of German financial institutions, set out in table 1. These figures show considerable changes between 1860 and 1913. Private bankers—either individuals or partnerships with unlimited liability—and the central bank and other banks of issue all experienced substantial declines. Two other groups, *Kreditbanken* (credit banks, whose defining characteristic was that they were joint-stock companies), and private mortgage banks (joint-stock banks whose loans, financed by issuing long-term bonds and debentures, had to be secured by mortgages), increased their shares significantly, the latter partly at the expense of public mortgage banks. Savings banks also increased their share considerably. These were initially set up by municipalit-

Table 1. *Share of different types of financial institution in the total assets of German financial institutions (per cent)*

	1860	1880	1900	1913
Central bank and banks of issue	22.4	11.6	6.3	4.4
<i>Kreditbanken</i>				
Large	} 9.2	10.0	17.2	9.2
Regional/local				15.0
Private bankers	35.3 ^a	18.5 ^a	8.6 ^a	4.4
Specialized commercial banks	—	—	—	1.1
Savings banks				
Local	12.0	20.6	23.3	22.9
Central	—	—	—	1.9
Credit cooperatives				
Local	0.2	4.4	4.1	6.3
Central	—	—	—	0.5
Mortgage banks				
Private	0.9	13.7	18.5	14.9
Public	16.0	13.0	10.0	7.9 ^a
Insurance companies				
Life	1.6	3.3	6.0	6.2
Property	—	2.6 ^a	2.0 ^a	2.3
Social insurance organizations	—	—	2.1	2.7
Other	2.4	2.3	1.7	0.3
Total	100.0	100.0	99.8	100.0

Note: ^a estimated figures

Source: Goldsmith, *Financial structure*, pp. 514-5

ies to encourage savings—even tiny sums—by poorer people. Later in this period they also had middle-class depositors. They were required to invest in absolutely safe securities, such as mortgage credits and gilt-edged securities. Over the period, credit cooperatives also increased their share, although it remained small. Industrial and agricultural credit cooperatives lent only to their members—small-scale manufacturers, tradesmen and retailers, or small cultivators respectively—although they received deposits from others.

Of these banks, *Kreditbanken* and some, but by no means all, private bankers were universal. The characteristic features of German universal

banking developed first among some private bankers in the 1830s in connection with railway building, mainly around Cologne, but also in some other parts of Germany.²⁴ During the cyclical upswing of 1848-56, some industrial companies were established with the assistance of private banks: again, the Cologne private bankers were especially prominent, and a large proportion of the industrial companies established were in the Rhineland and Westphalia.²⁵ But although some private bankers engaged in universal banking before 1870, they were not typical.²⁶ Moreover, their resources soon proved too limited for the large projects characteristic of universal banking business.²⁷ Consequently, many private bankers tried to establish joint-stock *Kreditbanken*, although they could not do so in large numbers until the requirement to secure state permission to form joint-stock companies, difficult to obtain in general and especially so for banks, was removed in 1870. After this date most German universal banks took the form of *Kreditbanken*, and many of the private banks which had engaged in universal banking became *Kreditbanken*, although some private banks survived as late as 1913.²⁸ The largest of the *Kreditbanken*, the *Großbanken*, predominated in security issue business and representation on the supervisory boards of industrial companies between 1880 and 1914.²⁹

To what extent did the 'universal' business of these *Kreditbanken* and private bankers include deposit banking? In early industrialization, hardly at all: until 1880, these banks accepted deposits from only a few large customers. Private bankers, by their nature, could never attract small deposits through a system of branches.³⁰ But even *Kreditbanken* did not generally accept deposits from individual small savers until the 1880s, following the lead set by Deutsche Bank in the late 1870s.³¹ Only in the 1890s did *Kreditbanken* begin to have significant numbers of branches and volumes of deposits.³² This is one reason for the relatively small share of the *Kreditbanken* in table 1. Small savers used savings banks, whose deposits were more than double those at *Kreditbanken* even in 1913.³³ Until the later stages of German industrialization, therefore, 'universal' banking did not involve mobilizing investible funds from large numbers of small savers.

Table 1 shows clearly that only a small share of the assets of German financial institutions was accounted for by universal banks. Even in 1913, the share of universal banks was between 24.2 (*Kreditbanken* alone) and 28.6 per cent (*Kreditbanken* plus private banks) but probably closer to the lower figure, given that, by this date, universal banking was untypical for private bankers. Savings banks and mortgage banks each commanded a share of assets comparable to that of universal banks. The share of the

²⁴ Tilly, *Financial institutions*; *idem*, 'Germany'; *idem*, 'Financing', pp. 129-30.

²⁵ Feldenkirchen, 'Banking', p. 121.

²⁶ Kocka, 'Entrepreneurs', p. 538.

²⁷ Tilly, 'German banking', pp. 127-8.

²⁸ Donaubauer, *Privatbankiers*, p. 37.

²⁹ Riesser, *Great banks*.

³⁰ Donaubauer, *Privatbankiers*, p. 43.

³¹ Riesser, *Great banks*, pp. 192, 473; Donaubauer, *Privatbankiers*, p. 43.

³² Barrett Whale, *Joint stock banking*, pp. 20-3, 31.

³³ Deutsche Bundesbank, *Deutsches Geld- und Bankwesen*, p. 16.

Großbanken, on which so much attention is focused, was only about 10 per cent in 1913, and even less at earlier dates.³⁴

Caution is needed in drawing conclusions from table 1 about the importance of universal banks for industrial financing. It is not necessarily the case that the share of different types of bank in the total assets of financial institutions accurately reflects their importance for industrial finance. The proportion of the assets of universal banks represented by claims on industrial firms may have been greater than that of, say, savings banks, which had to invest in absolutely safe securities, or of mortgage banks, whose loans had to be secured by mortgages. If this were the case, it might justify Kindleberger's claim that 'the great banks constituted less than a tenth of the total assets of financial institutions . . . but were found at the critical margin affecting economic growth'.³⁵

Unfortunately, data are lacking to compare the importance of claims against industrial firms for different types of German bank before 1914. But the question of whether universal banks were more important for financing industrial investment than is suggested by table 1 can be approached in another way.

III

It is possible to analyse whether universal banks played a major role in financing German industrial investment, and hence were at 'the critical margin affecting economic growth', by examining the firms to which they provided finance. German universal banking was fundamentally linked with joint-stock companies: the investment banking activities of universal banks involved either setting up new joint-stock companies or arranging an issue of securities, something only joint-stock companies could do. These were also the only type of firm legally required to have supervisory boards. The distinctive features of German universal banks highlighted in the conventional view of their importance—the combination of investment with commercial banking, and representation on supervisory boards—were thus relevant only for joint-stock companies. The claim that such companies, closely linked to universal banks, played a critical role in German industrialization is well summarized by Kocka:

The anonymous, large-scale mobilization of capital through joint-stock companies played a more important role in the German industrial revolution than in the English. The joint-stock company as an institution limited risks for an individual investor and thus overcame an important barrier to private investment activity. It facilitated the collection and investment of small contributions and thus made widespread savings available for industry. It loosened the close geographical and personal links between the distribution of savings and that of entrepreneurial opportunities. The joint-stock company also created a series of mechanisms which made the risks of investment more calculable for the private individual,

³⁴ One qualification necessary here is that by the early twentieth century several *Großbanken* headed groups of regional *Kreditbanken* which worked together and were more or less under the control of the *Großbank* in question. See Barrett Whale, *Joint stock banking*, pp. 28–31.

³⁵ Kindleberger, *Financial history*, p. 129.

and thus more attractive. It was associated, to an increasing extent, with the presence of investment banks. These institutions attracted savings and placed investments in a well-informed, prudent way. The combination of the joint-stock company and the investment bank thus created a strong mechanism for encouraging savings, which would not otherwise have been attracted to industrial investment, towards industry in need of capital.³⁶

But how important were joint-stock companies in German industrialization? Let us start with railway construction. Germany's 'take-off' is now generally dated to the 1840s, and railway building is supposed to have been very important in it.³⁷ Railways have been identified as a leading sector in German industrialization, through the enormous demand they generated for the outputs of heavy industry and their substantial reduction of transport costs.³⁸

Some of the earliest German railways, in the Rhineland and Saxony, were built by private joint-stock companies, and private bankers were important in organizing and financing them, providing the earliest examples of universal banking in Germany.³⁹ For example, Rhenish bankers made current account advances and organized security issues to keep the Rhenish Railway Company afloat in its difficult early years, influencing it by exercising the voting rights of a significant proportion of its shares and occupying strategic positions on its board of directors.⁴⁰ In the 1850s and 1860s, newly founded *Kreditbanken* joined private bankers in promoting railway companies and issuing their securities.⁴¹ Thus both types of German universal bank were involved in financing railway investment by private companies during industrial 'take-off'.

But the Rhineland and Saxony were not typical. In many parts of Germany, railway investment was undertaken not by private companies, but by the state. In Prussia (which governed much of the Rhineland), the state's role in railway construction during the 'take-off' was relatively minor: railways were built by private companies, with the state merely taking some shares or guaranteeing interest payments.⁴² But in the other German states the situation was different. Until Hanover was annexed by Prussia in 1866, all its railway lines were built by the state. The Baden and Württemberg railways were also constructed by the state, as were those in Bavaria, apart from two early exceptions (taken over by the state in 1844). Borchard estimates that, up to 1850, government funds provided 73.3 per cent of railway finance in the German states excluding Prussia,⁴³ compared with only 9.2 per cent in Prussia.⁴⁴ For German states as a whole, government funds provided about half of railway capital before 1850.

Private joint-stock companies, therefore, undertook railway investment in

³⁶ Kocka, 'Entrepreneurs', pp. 538-9.

³⁷ Spree, *Wachstumszyklen*; Tilly, 'German banking', p. 118.

³⁸ Fremdling, *Eisenbahnen*; *idem*, 'Railroads'; Holtfrerich, *Quantitative Wirtschaftsgeschichte*.

³⁹ Tilly, *Financial institutions*; *idem*, 'Germany'.

⁴⁰ *Idem*, 'Germany', p. 179.

⁴¹ Some details are provided by Riesser, *Great banks*, pp. 64-6.

⁴² Fremdling, *Eisenbahnen*, pp. 126-7.

⁴³ Borchard, 'Staatsverbrauch', p. 298.

⁴⁴ *Ibid.*, p. 296.

some German territories, especially Prussia, but also Saxony. Private banks and (later) *Kreditbanken* were significant in the foundation and initial financing of these companies. Lack of data precludes any estimate of the precise share of bank-provided funds in private railway investment. Since German railways became highly profitable almost immediately after beginning operation, they themselves probably generated some of the funds required for further investment.⁴⁵ But even if universal banks were central to the organization and finance of private railway companies, the fact remains that outside Prussia, such companies were the exception: most German railways were built and financed by the state. Universal banks may have been significant in railway financing during German 'take-off', but they were not as important as the state.

What about the importance of joint-stock companies in industry generally? There were few of these entities in Germany until after 1870, because until then they required government permits, which most German states were reluctant to grant. In Prussia, some industrial joint-stock companies were approved before 1870: 37 up to 1850, and a further 107 in the following decade (66 of them in mining and smelting) in addition to those approved to build railways.⁴⁶ After 1870 joint-stock companies of all types, including industrial ones, began to proliferate, although the downswing of 1873-9 meant that many of the companies founded in the boom of 1870-3 did not survive for long. But from the 1880s onwards the number rose rapidly, from 2,143 in 1886 to 5,486 in 1913.⁴⁷

The total number of joint-stock companies does not, however, indicate their importance in German industrial activity. The only data available for assessing this are Hoffman's estimates of the total industrial capital stock in Germany and the net capital of industrial joint-stock companies (i.e., excluding those in banking, insurance, and railways).⁴⁸ Hoffman makes it clear that these estimates are rough, and hence any conclusions drawn from them must be cautious.

Table 2 shows the proportion of the total industrial capital stock accounted for by industrial joint-stock companies, according to Hoffman's estimates. The very low proportions for 1860 and 1870 are consistent with the small number of joint-stock companies then in existence. Their very small share in total industrial capital before 1870 implies that the significance of universal banking for the finance of industrial activity at that time was also minor. It was not until the 1880s that the share of total industrial capital accounted for by joint-stock companies increased markedly, and this is consistent with the known effects on company numbers of the boom and slump of the 1870s. But the most striking feature of table 2 is that, even in 1913, Hoffman's data (which are of better quality for the early twentieth century) show that 80 per cent of the industrial capital stock was accounted for by firms which were not joint-stock companies—sole proprietorships, partnerships, and private companies. These types of firm could not issue

⁴⁵ Fremdling, *Eisenbahnen*, pp. 132-50; Bongaerts, 'Financing'.

⁴⁶ Blumberg, 'Finanzierung', pp. 176-8.

⁴⁷ Deutsche Bundesbank, *Deutsches Geld- und Bankwesen*, p. 294.

⁴⁸ Hoffman, *Wachstum*, pp. 239-41, 767-87.

securities, and did not have supervisory boards. The investment banking activities of universal banks were of no consequence to them, and the possibility of the provision of loan finance being increased by bank representation on a supervisory board did not even arise.

Table 2. *Net capital of industrial joint-stock companies as a proportion of the total industrial capital stock*

Year	%	Year	%
1860	7.61	1900	16.19
1870	7.77	1910	19.74
1880	9.46	1913	17.77
1890	14.92		

Source: authors' calculations, based on Hoffman, *Wachstum*, pp. 255-6, 785, 812. The net capital of industrial joint-stock companies before 1882 is estimated by extrapolating backwards from the 1882 figure on p. 785 using the net investment figure for such companies from p. 812.

But perhaps these figures were actually high by international standards? An obvious comparison is with the UK. No estimates exist of the proportion of the UK industrial capital stock accounted for by joint-stock companies, but there are estimates of their share of business profits. A 1927 estimate found that public companies accounted for 57 per cent of total UK business profits.⁴⁹ The precise basis for this is not clear, nor is the exact date for which it applies, although it appears to be for some point in the early 1920s. More detailed estimates by Worswick and Tipping find that corporate enterprises, defined as public and private companies, local authorities, trade associations, and similar undertakings, accounted for 59 per cent of gross profits in the six major UK industrial groups in 1909, and 55 per cent in 1927.⁵⁰ Unfortunately, these calculations cannot be broken down to obtain the share of public companies alone. However, according to Worswick and Tipping, 76 per cent of gross profits in manufacturing were earned by corporate enterprises in 1909; since local authorities and trade associations do not engage in manufacturing, this applies to public and private companies only.⁵¹ The 1927 estimate cited above found that public companies accounted for 75 per cent of total company profits in the early 1920s.⁵² If this was their share in 1909, then public companies accounted for 57 per cent of gross profits in manufacturing in the UK that year. If these estimates can be taken as roughly comparable with the German figures based on shares of the industrial capital stock, then joint-stock companies were significantly less important in Germany than in the UK just before 1914.

Examining the significance of company shares in the national balance sheet yields similar findings. Only public companies can offer shares for

⁴⁹ Committee on National Debt and Taxation, *Minutes*, II, QQ 8550-I, p. 641.

⁵⁰ Worswick and Tipping, 'Profits', pp. 25, 47.

⁵¹ Sargent Florence, 'Logic', p. 204.

⁵² Committee on National Debt and Taxation, *Minutes*, II, QQ 8550-I, p. 641.

public subscription, so comparing the significance of company shares in the German and UK national balance sheets provides an indication of the relative importance of public companies in the two economies. In 1895, domestic company shares accounted for 2.1 per cent of national assets in Germany and 12.4 per cent in the UK; in 1913, the proportions were 2.9 per cent and 10.0 per cent.⁵³ Again, this indicates that joint-stock companies made a significantly smaller contribution to economic activity in Germany.

Thus, both absolutely and relatively, industrial joint-stock companies accounted for only a small proportion of overall industrial activity in Germany in 1913, and even less at earlier periods. Unless the linkages from these companies to the rest of the industrial sector were extraordinarily important for German industrialization, these empirical findings refute the claim that such companies, and through them the universal banks, were crucial for industrialization. No study exists supporting the idea that industrial joint-stock companies were a leading sector, yet this possibility cannot be excluded. Before concluding that tables 1 and 2 provide consistent evidence of a relatively small role played by universal banks in German industrialization, we must investigate whether universal banks did provide substantial amounts of external finance for industrial joint-stock companies, and hence, via some putative linkages from these companies to the rest of the industrial sector, were at the critical margin influencing growth.

IV

It is claimed that German universal banks provided substantial amounts of external finance to industrial joint-stock companies, because of their influential position in the governance of these companies. Share voting rights, and especially supervisory board representation, are seen as enabling banks to control the behaviour of managers, thereby limiting the risk involved in supplying large amounts of external finance. Close relationships between banks and industrial companies, it is argued, also gave banks information required to provide external funds in large quantities. The empirical basis for these claims is actually very limited.⁵⁴ Comprehensive information about the finance of investment by German industrial joint-stock companies over this period is lacking. But considerable doubt is cast on the accuracy of commonly held views about the role of universal banks in financing these companies by a number of recent detailed studies, including analyses by Rettig and Tilly of the sources of finance of samples of companies listed on the Berlin stock market, and investigations by Feldenkirchen and Wellhöner into company finance and the role of banks, using companies' archives and accounts.⁵⁵

All available studies of the sources of finance of industrial joint-stock companies between 1880 and 1914 find that internally generated funds were

⁵³ Figures are from Goldsmith, 'Balance sheets', p. 153 (share of domestic shares in financial assets), pp. 225, 233 (share of financial assets in national assets).

⁵⁴ Cassis, 'British finance', p. 8.

⁵⁵ Rettig, 'Investitions- und Finanzierungsverhalten'; Tilly, 'Banken'; Feldenkirchen, 'Banks'; *idem*, *Eisen- und Stahlindustrie*; *idem*, 'Capital raised'; *idem*, 'Finanzierung'; Wellhöner, *Großbanken*.

overwhelmingly the most important. Rettig found this for a sample of 50 listed industrial enterprises between 1880 and 1911, as did Tilly for a sample of several hundred listed enterprises over a similar period. Feldenkirchen's studies of iron and steel, mechanical engineering, electrical, and chemical companies consistently show the dominant role of internal finance. So, too, does Wellhöner's detailed study of nine companies in heavy industry.

Table 3. *Share of internally generated funds^a in total payments into investment accounts for 11 Ruhr steel firms (per cent)*

<i>Firm</i>	<i>1878/9-1894/5</i>	<i>1895/6-1913/4</i>	<i>1878/9-1913/4</i>
Gutehoffnungshütte	129.1	75.9	79.8
Krupp	148.7	98.7	106.6
Hörder Verein ^b	61.8	91.7	76.3
Phoenix	112.1	111.1	111.2
Bochumer Verein	177.0	66.0	82.3
Union ^c	168.2	88.9	106.1
Rheinische Stahlwerke	89.1	66.8	68.0
Hoesch	167.0	94.9	99.3
Schalker ^d	124.1	101.7	103.9
Deutsch-Luxemburgische ^e			53.9
Gewerkschaft Deutscher Kaiser ^f			75.9
Average	122.1 ^g	84.6	87.4

Notes:

^a undistributed profits plus depreciation

^b for period up to and including 1905/6

^c for period up to and including 1909/10

^d for 1889/90-1903/4, 1 July-31 Dec. 1904, 1905, 1906

^e for 1901/2-1913/4

^f for 1892-1913

^g excluding Gewerkschaft Deutscher Kaiser

Source: Feldenkirchen, *Eisen- und Stahlindustrie*, p. 287

An illustrative example is table 3, taken from Feldenkirchen, which shows the extent of internal financing by the major Ruhr steel firms. These figures are not necessarily representative of all German industrial companies, but this sample of firms did account for roughly three-quarters of iron and steel production in the Ruhr immediately before 1914, so it is representative of this branch of heavy industry.⁵⁶ Given the conventional focus on the role of universal banks in financing heavy industry,⁵⁷ and the dominant position of the Ruhr in this sector, the figures in table 3 are very striking. From the late 1870s until 1895, the internally generated funds of this group of firms as a whole were more than sufficient to finance their investment. Even after 1895, more than 80 per cent of investment was still financed internally. The other studies cited above find the same: although external finance became more important from the 1890s, internal finance remained the dominant source of funds. Banks' contribution to the finance of investment by industrial joint-stock companies between 1880 and 1914 was secondary; internal sources of funds predominated.

⁵⁶ Feldenkirchen, 'Banks', p. 27.

⁵⁷ Gerschenkron, 'Economic backwardness', p. 15.

In what forms did industrial companies raise external finance during this period? The 1873-9 downswing made universal banks reluctant to provide long-term investment finance through holding shares in companies themselves. Consequently, firms needing external finance for investment had to issue securities on the stock market. Banks naturally played an important role in arranging the details of such issues.⁵⁸ They also made short-term current account loans to companies to 'pre-finance' investment—to bridge the gap between the time when investment was needed and the time when stock-market conditions were favourable for an issue of securities. The gap could be as long as several years, so current account loans made for this purpose were often renewed, thus serving as longer-term loans. But their purpose was to provide bridging finance: when the time was ripe, an issue of securities was made, and the bank loan repaid. Banks were willing to provide such current account loans because they anticipated that an issue of securities would eventually follow, from which they would earn fees. It is not surprising, therefore, that companies made increasing use of short-term bank credit from the 1890s onwards, as external finance for investment became relatively more important.⁵⁹ But bank loans were not a source of long-term investment finance.

Although internal finance was the major source of funds for industrial companies overall, there was variation among firms, as can be seen in table 3. In some cases, external finance from banks was a significant source of funds over quite a long period. One example is the Deutsch-Luxemburgische mining and smelting company, which required substantial amounts of external finance (both current account loans and bank-arranged securities issues), from its foundation in 1901/2 until 1914.⁶⁰ Another is Mannesmann, which received extensive financial support from Deutsche Bank for many years while the firm developed seamless tube production.⁶¹ Other particular cases arose when financial difficulties made bank assistance necessary for a firm's survival. This occurred more frequently in the 1873-9 downswing and the relatively slow-growing 1880s. Examples include the loan that Krupp took up in 1874,⁶² the financial reorganization of the Hörder Verein in 1891 which saved it from bankruptcy,⁶³ and the use of current account loans by Gutehoffnungshütte and Rheinische Stahlwerke in the 1870s.⁶⁴

In both sorts of case, the importance of bank finance for the firm's operations enabled banks to exert considerable influence on business policy. Deutsche Bank did so at Mannesmann, for example, and the banks responsible for the financial reorganization of the Hörder Verein in 1891 required the firm to agree not to enter into business relations with any other bank. It must be appreciated, however, that banks were able to exert such influence only when a firm depended significantly on bank finance, and this

⁵⁸ Wellhöner, *Großbanken*, pp. 238-9.

⁵⁹ Feldenkirchen, 'Banks'; *idem*, 'Capital raised'; *idem*, 'Finanzierung'.

⁶⁰ Wellhöner, *Großbanken*, pp. 171-3.

⁶¹ *Ibid.*, pp. 125-34.

⁶² *Ibid.*, pp. 155-7.

⁶³ Feldenkirchen, 'Banks', p. 33.

⁶⁴ Wellhöner, *Großbanken*, pp. 97, 107, 121.

was not typical. Indeed, firms subjected to bank influence because of temporary financial distress were often extremely concerned to avoid it subsequently, refusing to undertake investments which required borrowing from banks. Both Gutehoffnungshütte and Krupp consistently avoided bank borrowing after their experiences in the 1870s precisely because they refused to risk exposing themselves to bank influence.⁶⁵

The period 1895-1914 saw industrial companies making greater use of external finance, partly because of relatively rapid economic growth, and partly because mergers increased industrial concentration. Both factors increased the profitability of investment, making industrial companies more willing to use external funds to finance investment. However, this did not increase banks' ability to influence industrial companies, even though external finance through loans or security issues involved banks and even though bank representation on companies' supervisory boards increased in this period. The high profitability of German industrial companies in this period created enormous competition among banks for firms' financial business. Furthermore, mergers often brought several large banks onto a firm's supervisory board, and there is copious evidence that competition among these banks limited their collective ability to influence the company.⁶⁶ Concentration also increased the size of many industrial companies to such an extent that a consortium of banks was necessary when such firms wished to raise external finance, since no single bank was large enough; this, too, increased the number of banks represented on supervisory boards. Stronger bank representation on supervisory boards between 1895 and 1914 did not, therefore, increase banks' ability to influence the behaviour of industrial companies.

It is often claimed that the concentration and cartel formation between 1895 and 1914 was a consequence of bank influence on industrial companies.⁶⁷ But when we look closely at particular cases which are supposed to illustrate this, a different picture emerges. In 1904, at an extraordinary general meeting of shareholders in the Phoenix steel firm, the Schaffhausen'sche Bankverein and the other banks on the firm's supervisory board were able to swing the vote in favour of Phoenix joining the Steel Works Association, despite the opposition of the Phoenix management board. This is portrayed in the literature as a prime example of banks' ability to determine the behaviour of industrial companies.⁶⁸ Yet Wellhöner shows that the banks did this only because of pressure by other steel firms, particularly Thyssen, which wanted Phoenix to join.⁶⁹ The Steel Works Association was expected to be so profitable that there was enormous competition among banks for its future banking business, and the banks were threatened with exclusion

⁶⁵ Ibid., p. 99; Feldenkirchen, 'Banks', p. 32.

⁶⁶ Wellhöner, *Großbanken*, p. 240.

⁶⁷ Gerschenkron, 'Economic backwardness', p. 15.

⁶⁸ Barrett Whale, *Joint-stock banking*, pp. 62-4; Tilly, 'Financial history', pp. 84-5.

⁶⁹ Wellhöner, *Großbanken*, pp. 85-7.

from this business unless they brought Phoenix into the association.⁷⁰ This incident is therefore an example of the power of industrial companies over banks, not of the converse. The 1906 merger between Phoenix and the Hörder Verein is also adduced as demonstrating bank influence: the Schaffhausen'sche Bankverein supposedly furthered the merger because the two firms would complement each other. But Wellhöner shows that the Schaffhausen'sche initially resisted the merger strongly, for fear of losing its leading position at the Hörder Verein.⁷¹ Once again, it was Thyssen—an industrial company—which was the driving force behind the merger.

Close empirical examination of the activities of bank representatives on companies' supervisory boards shows that the role of these banks in the concentration process was to provide companies with information, obtained from business contacts, concerning which firms might be suitable candidates for merger, not to force mergers upon reluctant companies. Indeed, more generally the role of bank representation on supervisory boards was to enable banks and companies to coordinate their actions in areas of common interest, of which the most important was financing the company's investment programme. But banks were not involved in any detail in substantive planning of industrial investment, because the bank representatives lacked both the requisite time and detailed knowledge.⁷² The banks' role was not to plan investment policy, but to ease its implementation. There are examples of bank supervisory board representatives attempting to change the internal organization of companies so as to improve efficiency, but these attempts were usually resisted by the firms.⁷³ It was only when a firm was in temporary financial difficulty that banks were able to insist on changes (as in the transformation of Siemens to a joint-stock company in 1897, in accordance with Deutsche Bank's wishes).⁷⁴

The picture which emerges is not consistent with the claim that German universal banks exerted substantial control over industrial companies and provided significant amounts of finance. Although there are some cases of this, these were the exceptions to the general rule, which was for companies to finance themselves internally to a very great extent. The other cases in which banks were able to exert some control arose when firms were in temporary financial difficulties, but once these difficulties were overcome, bank influence ceased. German industrial joint-stock companies made more use of external finance in the period 1895-1914 than earlier, but their high profitability in this period meant that competition among banks for their business was so strong that despite the increase in bank supervisory board representation the greater use of external finance did not increase banks' ability to influence firms.

⁷⁰ Wellhöner quotes from a letter written by Rheinische Stahlwerke, a firm belonging to the Steel Works Association, to the official at Deutsche Bank responsible for relations with heavy industry in the Rhineland and Westphalia: 'it will be attempted to exclude those banks which did not try and are still not trying to move Phoenix to join the Steel Works Association. Such banks could potentially only be chosen if they in future would agree that their voting rights would be exercised more in accordance with the views of the Association' (ibid., p. 87).

⁷¹ Ibid., p. 83.

⁷² Ibid., pp. 239-42.

⁷³ Ibid., p. 241.

⁷⁴ Ibid., p. 217.

V

Universal banks accounted for a relatively small proportion of the total assets of financial institutions in Germany before 1914. The distinctive features of German universal banks highlighted in the conventional view of their importance were relevant only to private joint-stock companies, and these accounted for a relatively small proportion of German industrial activity. Railway building was central to German industrial 'take-off', but private railway companies, to whose financing the early universal banks made a significant contribution, operated only in some parts of the country. For Germany as a whole, state finance was the largest single source of funds in early railway building, and overshadowed the financing role of the early universal banks. Industrial joint-stock companies could be set up easily only after 1870, and before 1914 they never accounted for more than 20 per cent of the industrial capital stock. Correspondingly, 80 per cent or more was accounted for by firms for which the universal banks' combination of investment with commercial banking, and their representation on supervisory boards, simply did not apply. Universal banks may have supplied investment finance to some of these firms, but their distinctive characteristics did not play any part in their doing so: their scope for providing funds to firms which did not issue securities and did not have supervisory boards was the same as that of other, non-universal, banks.

The industrial firms on which the universal banks concentrated were joint-stock companies. Comprehensive information about the sources of investment finance of these companies, and the influence of the universal banks on them, does not exist, so any conclusions drawn must be tentative. But existing detailed studies cast considerable doubt on the conventional view that universal banks made an important contribution to financing industrial joint-stock companies. Although examples consistent with the conventional view certainly exist, they are not typical: in most cases, internally generated funds were by far the most important source of investment finance, and banks were not in a position to exert any control on companies' management, despite supervisory board representation, except in atypical cases where a company was substantially dependent on its bank for funds.

For much of the period 1870-1914 industrial joint-stock companies as a group appear to have been entirely self-financed, but in the 1870-3 boom, and again in 1895-1914, they raised long-term investment finance via share issues organized by universal banks. The extent of such financing in the 1870-3 period is not known, but even if it was large, it does not seem to have made a very significant contribution to industrialization, since many of the companies founded during those years did not survive. The losses on shares sustained by universal banks in the later 1870s subsequently deterred them from providing external finance in the form of long-term share holdings. In 1895-1914 the external finance raised by industrial companies was modest compared with internally generated funds, but nevertheless enabled them to take advantage of investment opportunities that could not be financed from internal sources alone. However, industrial

companies' increased use of external finance in this period was not due to the increased representation of banks on supervisory boards. The evidence suggests the opposite causation: bank supervisory board representation increased because industrial companies were raising more external finance. There is certainly no evidence to support the view that, in the 1895-1914 period, universal banks compelled industrial companies into mergers and cartels which rationalized production and increased profitability. Whatever the economic merits of the increased concentration in German industry of the early twentieth century, the driving force behind it came from industrial companies, not banks. Again, some evidence suggests that these mergers did not result from, but contributed to, increased supervisory board representation by banks.

The available evidence does not support the view that universal banks made large contributions to the finance of investment by German industrial joint-stock companies, so that even if one argued that these companies were a leading sector in German industrialization, it would be difficult to assign a central role in industrialization to the universal banks. In fact, no empirical study does claim that industrial joint-stock companies were a leading sector. This conclusion, in combination with the figures in tables 1 and 2, leads to an assessment of the contribution of the German system of investment finance to economic growth before 1914 which is different from the conventional one. Table 1 shows that types of bank other than universal banks were important in the German financial system, table 2 that types of firm other than the joint-stock companies on which universal banks concentrated were important for German industrial activity. The natural conclusion to draw is that savings banks, mortgage banks, and credit cooperatives supplied external finance to the industrial firms which were not joint-stock companies, but which accounted for most of the industrial capital stock in Germany. Although much less is known about the sources of investment finance for these firms than for joint-stock companies (which may account for their neglect in standard accounts of German industrialization), there is some evidence that they depended for external funds mainly on the non-universal German banks. Small and medium-sized industrial firms could borrow from savings banks, provided that the loan was secured by a mortgage.⁷⁵ The same was true for borrowing from mortgage banks, and Henning argues that such banks were important financiers of industry as well as housing.⁷⁶ Credit cooperatives lent to small-scale manufacturers.⁷⁷ Donaubauer argues that, as private banks were taken over by *Kreditbanken*, the small and medium-sized industrial firms which had raised external finance from private banks, and in which *Kreditbanken* were not interested, turned to savings banks and credit cooperatives for funds.⁷⁸ The quantitative significance of industrial firms which were not joint-stock companies, and of banks which were not universal, when combined with the evidence on the limited contribution of universal banks

⁷⁵ Born, *International banking*, pp. 107-10; Thomes, 'German savings banks', pp. 153, 157.

⁷⁶ Henning, *Industrialisierung*, p. 257.

⁷⁷ Born, *International banking*, p. 110.

⁷⁸ Donaubauer, *Privatbankiers*, pp. 206-9.

to the finance of industrial joint-stock companies, points to a clear conclusion: the role of universal banks in German industrialization has been over-emphasized.

Finally, there is James's argument that the contribution of universal banks to German economic development must be measured in terms not only of the funds they supplied, but also of improved information flows resulting from banks' ability to compare firms within an industry, and industries within the economy, as a result of their positions on supervisory boards.⁷⁹ The evidence discussed in section V is certainly consistent with the view that bank representatives on industrial companies' supervisory boards were able to contribute information obtained from their business contacts. But the argument that the German economy as a whole had better information flows for making investment decisions as a result of the positions of universal banks on supervisory boards implicitly assumes that most German economic activity before 1914 was carried out by joint-stock companies on whose supervisory boards a relatively small number of universal banks were represented. As has been shown, this is a misleading characterization of the German economy. Most industrial activity was carried out by firms which did not have supervisory boards and which raised external finance from non-universal banks. Indeed, on the eve of the First World War, there were far more banks, and the overall banking system was less concentrated, in Germany than in the UK.⁸⁰ The claim that the German economy enjoyed better information flows for economic decisions due to the coordination effected by a small number of universal banks appears to be no better supported than are the other claims about universal banks and German industrialization.

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⁷⁹ James, 'Introduction', p. 10; *idem*, 'Banks', pp. 116-7.

⁸⁰ Cassis, 'British finance', p. 10.

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