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RELATIONSHIP BANKING AND CORPORATE GOVERNANCE IN THE KAISERREICH

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Abstract

This paper focuses on the institution of interlocking directorates between universal banks and industrial firms in the *Kaiserreich* (1871-1914) and demonstrates that such formalized relationships were unusual prior to 1900. The investigation indicates further that there was a marked increase in bank representation at firms–both in the share of firms involved in such relationships and in the number of joint directors–around the turn of the century. Finally, the work suggest a number of explanations for the pattern of bank relationships that emerges.

RELATIONSHIP BANKING AND CORPORATE GOVERNANCE IN THE *KAISERREICH*[*]

Caroline Fohlin

I. Introduction

Economic historians have often pointed to the universal banks of the *Kaiserreich* as the prime example of Gerschenkron's hypothesis that in moderately-backward economies, financial institutions act as an impetus for industrialization. The German banks combined short-term commercial business with long-term investment functions to become the supermarkets of financial services. The development of close relationships between bankers and industrialists, which is considered a fundamental characteristic of the universal banks, is thought to have made this style of finance an important link in the industrialization process.[1]

Long-term relationships between banks and firms are thought to have been established and maintained through placement of representatives on boards of directors (more accurately, the *Aufsichtsrat*). This practice of interlocking directorates has become a trademark of the German style of banking and of the Great Banks in particular. Passow (1905) gave a rare contrary interpretation of the *Aufsichtsrat*, concluding that directors' functions varied widely from firm to firm, and that no general inference could be made regarding the power of the institution. However, most have agreed with Jeidels (1905), who claimed, "...the power of the Great banks is exercised via the legal institution of the *Aufsichtsrat*, rather than through direct influence of financial strength."[2]

The present paper focuses on the institution of interlocking directorates between universal banks and industrial firms and demonstrates that such formalized involvement was unusual prior to 1900. The research indicates further that there was a rapid increase in bank representation at

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[1]Gerschenkron (1962), Jeidels (1905), Riesser (1911), Schumpeter (1939), and Whale (1930), among many others, have emphasized this point.

[2]Jeidels (1905), p. 145, author's translation.

firms--both in the number of firms involved in such relationships and in the number of joint directors--around the turn of the century. Thus, the move to interlocking directorates occurred after the period considered pivotal for heavy industrial development.

This line of research is important for a number reasons. First, the lack of comprehensive evidence on the interaction between banks and firms in the last part of the nineteenth century stands as a glaring omission in the historiography of German corporate finance. Also, the findings in this paper challenge long-standing assumptions about firm-bank relationships in Germany, and in doing so, it may also call into question other notions we have about German finance.[3]

The results of this research may also have implications for policymakers, who have long looked to Germany and its extended experience with universal banking as a model for banking regulation in the United States. In 1911, the U.S. Monetary Commission produced an English translation of Riesser's (1910) enormous work on the German Great Banks as part of the government's effort to analyze German banking practices. Today, the U.S. Congress is in the process of repealing depression-era banking regulations (Glass-Steagall, in particular), based in part on the notion that a German-style system would be preferable.[4]

The paper is divided into the following parts. Section II gives a brief background on the relationships between banks and industry in the *Kaiserreich* and explains the rationale behind using interlocking directorates to measure bank involvement. Section III discusses the data sources and methods and section IV presents the results. Section V compares the findings to the expected outcomes and offers several possible explanations for the contrary findings. Section VI concludes.

II. Background

"The activity of the banks in the economic life of society has often been likened to that of the heart in the human body...For just as it is the function of the heart to regulate by means of certain organs the circulation of the blood, which through countless arteries and veins flows through the human body and returns to the heart, so...it is the function of the banks to regulate by certain economic measures the circulation of capital, which flows from them and returns to them, and

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[3]Indeed, Wellhoener's (1989) and Lee's (1991) books already challenge some of the assertions made by earlier historians.

[4]Recent research that finds in favor of the universal system includes Calomiris (1994) and Saunders and Walter (1994). For a contrary point of view, see the recent *New York Times* OP-ED piece by John Moscow (June 28, 1995).

which may properly be regarded as the life blood of the modern economic organism."[5]

The credit banks--as indicated by the above analogy--were among the most prominent institutions in the German economy and society at the turn of the last century. Their operations extended to many realms of corporate finance, but they were particularly conspicuous due to their size.[6] The *Kreditbanken*, while accounting for fewer than 1% of banking institutions in 1900, held over a quarter of all bank liabilities. On average, these banks each held over 100 million Marks in liabilities in 1913. This number is yet more impressive when calculated for the nine great banks (932 million on average) and when compared to the savings banks, which averaged just over 6 million Marks of liabilities apiece.[7]

One of the features that distinguished the German universal banks from other financial institutions in Germany and elsewhere was the broad range of credit services they provided for their client firms. These included current accounts; acceptances, bill discounting, lombards and reports; brokerage; and promotions (meaning transformations, foundings, issuing, syndications and securities). The wide variety of operations was a matter of policy: Jeidels (1905)--a bank employee himself--commented that it was "in the interest of the security, profitability, and longevity of a credit institution to provide for all of the credit needs of a firm, from its formation to its liquidation."[8] Bank involvement normally began with the extension by the bank of current account privileges and progressed from the granting of various other forms of credit ultimately to the underwriting of the firm's securities. It is this combination of services within one institution--and the economies of scope that should theoretically result--that has led many to suggest that the

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[5]Riesser (1911) p. 186. An earlier, if more reserved, circulatory system reference can be found in *Der Deutsche Ökonomist* of June 23, 1883.

[6]There is an enormous literature describing both debit and credit operations. See, for example, Bosenick (1912), Buchwald (1909), Jeidels (1905), Motschmann (1915), Riesser (1910 [1911]), and Whale (1930). In Riesser (1911) see pp. 191-406 for an exhaustive discussion.

[7]Computed from Deutsche Bundesbank (1976).

[8]Jeidels (1905), p. 63, author's translation. Others also made this point. See, for example, Lansburgh (1909), Loeb (1902), and Staub (1900).

German financial system was more efficient than its contemporaries at the turn of the century.[9]

Less easily documented than credit operations is the common perception that the Great Banks played an important entrepreneurial role through identifying promising new industries and investments and by offering advice to their client firms. This hands-on style of financing is supposed to have been facilitated by the close, long-term relationships that banks fostered with industry. The literature on German universal banking suggests at least three indicators--all related to the banks' credit operations--of the existence of a long-term relationship between a bank and a firm: the extension of current account privileges to firms, the holding of firms' securities by a bank, and the placement of bank officials on the boards of directors of firms.

A current account with a credit bank provided a firm with many services and opportunities for short-term credit, and such arrangements often led to the provision of other services. However, credit bank current accounts were widespread--particularly among joint-stock companies. Although the current account provided the bank with a window into the financial status of many firms, this insight could easily be impaired if the firm held accounts with more than one bank. Furthermore, a simple current account relationship would not have allowed monitoring of firms' investment projects--particularly when the firm had similar agreements with multiple banks. The existence of a current account alone, therefore, fails to discriminate between firms which had only a loose bank connection and those which were more intimate.

A stronger link might be inferred if there were evidence that a bank held substantial quantities of a firm's securities. The German credit banks were actively involved in transformations of old firms into joint-stock companies and foundings of new firms. These activities were often followed by the issuing of the firm's stocks or bonds by the bank. As a result of many of these promotional operations, the banks usually held--both voluntarily and otherwise--the securities of their client firms, thereby providing further credit. Though the relationship resulting from promotional activities was almost certainly closer than that suggested by a current account, the holding of firm securities was nonetheless common and is therefore a weak indicator of bank attachment.

The most powerful expression of a firm-bank relationship--one that has been emphasized

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[9]See, for example, Calomiris (1994) and Kennedy (1987).

repeatedly--is the placement of bank directors on firms' supervisory boards (*Aufsichtsrat*).[10] In addition to direct power through voting rights, positions on firms' boards would have allowed banks access to the inner workings of the firms they financed and also would have, in theory at least, acted both as a commitment mechanism between the two organizations and as a quality signal to investors. When the same banker is found on a given firm's board for several years on end, it would seem appropriate to assume that a close relationship existed between that bank and firm.

Ideally, all three indicators of bank attachment could be used to measure gradations of involvement. However, due to the paucity of firm-level data on current accounts and securities holdings, the investigation must be limited to interlocking directorates. While this criterion may overlook firms with weak connections to a bank, it should not falsely categorize firms with no bank relationships as attached. Furthermore, since the three types of interaction normally occurred as steps towards increased involvement, it may perhaps be assumed that firms and banks with overlapping boards had already progressed through the current account and securities issue stages.

Whether or not the bank successfully exerted influence through firms' boards of directors remains to be determined, but the presence of bank representatives on company directorates still offers strong evidence of bank connections. It is, therefore, worthwhile to investigate the development of such relationships.

III. Data

The data for this study were compiled from the industrial securities reports in *Saling's Börsen-Jahrbuch*, a stock market annual targeted toward bankers and investors. *Saling's* was published annually starting in 1877/8 and included several types of information for investors. Part II of *Saling's*, the series used in this study, contains entries on hundreds of joint-stock companies

[10]The American term Board of Directors does not accurately correspond to German corporate governance forms. German joint-stock firms were controlled by two separate bodies. The *Vorstand* was made up of firm managers who oversaw day to day operations, while the *Aufsichtsrat* was comprised of representatives of shareholders' interests. These members were not required to hold equity positions in the firms on whose boards they sat.

traded at the Berlin stock exchange--including balance sheet summaries, profit and loss statements, listings of their *Vorstand* and *Aufsichtsrat* members, as well as histories of their share capital, relative share prices, and dividends. Although *Saling's* offers no clear discussion of criteria used for inclusion of a particular firm, it is clear from other sources that many firms that were not officially listed on the Berlin exchange were referenced in this series in the early years. For example, while 250 domestic industrial firms (that is, excluding banks, insurance companies, other commercial enterprises, and railroads) can be found in the 1880 issue of *Saling's--part II*, only 41 industrial shares (including bond issues) were officially listed in Berlin in 1880. By 1900, there existed approximately 3,000 joint-stock firms in Germany. In this year, 753 industrial securities had official listings in Berlin, and *Saling's--part II* reported on 626 industrial firms in its Berlin report.[11] Thus, the data source may be biased toward larger, more established firms.[12]

The analysis is based on three samples: 1. a continuous panel of 50 long-lived firms that were traded at the Berlin Bourse between 1880 and 1913; 2. a continuous, random panel of 50 new joint-stock firms (covering the same period); and 3. eight random cross-sections of 25 firms each, selected at four-year intervals from 1882 through 1910. Sample I reflects the sectoral distribution of joint-stock companies reported in *Saling's* in 1900. The data were also chosen to represent size and geographical variation, and selection was limited to those firms in existence prior to 1880 (with the exception of A.E.G., which was founded in 1883).[13]

The sample II firms were randomly selected from those with entries published in the 1900 issue of *Saling's* and follow roughly the same pattern of sectoral distribution as sample I. Selection was constrained to the set of firms that began operations as joint-stock companies after

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[11]Computed from Sombart (1913) and *Saling's* (1883/4, 1901/2).

[12]Potential biases are discussed further below. There were other stock market yearbooks, at least one of which covered all joint-stock firms. Unfortunately none of these was published until 1895, and the volumes prior to 1910 are scarce.

[13]The firms in the sample are on average 2 to 4 times larger than their corresponding sectoral means, but this may result from the selection criterion of long-lived firms and biases toward larger firms in the data source rather than from the lack of randomness in sampling.

1879 to allow for testing of start-up effects.[14] Sample III was selected randomly and without any constraints on the population. The firms in the samples fall into nine sectoral categories: mining and smelting, metal, textiles, chemicals, electrical, construction, transportation and shipping, food products, and miscellaneous.

The three samples permit investigation of a variety of phenomena. For example, samples I and II allow comparisons between given sets of long-lived and newly-organized firms over an extended period, while sample III is necessary for comparing rates of relationship formation over the period 1880-1913, without regard to the age or longevity of the particular firms involved.

By comparing the board members of the firms in the samples with those of all joint-stock banks listed in *Saling's* in the same years (which includes all of the Great Banks and nearly-Great Banks as well as hundreds of smaller, similarly structured credit banks), I have determined which banks were represented on the firms' boards and how many directors were members of both bank and firm boards. Sample I and II firm boards were cross referenced with the bank boards for 1882, 1894, 1900, 1905, and 1910.[15] Similarly, sample III firms were matched with the banks listed in Saling's for the years corresponding to the eight sub-samples--1882, 1886, 1890, 1894, 1898, 1902, 1906, and 1910.

It would be desirable to establish whether an individual found on multiple boards was a representative from the bank to the firm or vice versa. It is difficult to make such a distinction, since we are considering, for the most part, positions of equivalent stature. The chair and vice-chair are indicated in *Saling's*, but it is not clear that a chairmanship may be equated with primary allegiance. The *Vorstand* is comprised of firm managers, and thus presence in that body denotes a degree of control not indicated by membership in the *Aufsichtsrat.* However, since few of the

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[14]Some firms may have operated under alternate forms before becoming joint-stock companies. Such firms are eliminated from consideration to the extent that they are identifiable. Transformation into the joint-stock form was often associated with an increase in capital and other significant changes in operations, and thus can be seen as the beginning of a new stage in the life of the firm. Because the firms are organized in the book alphabetically by industry, I chose the firms for the sample by selecting the first firm after every nth page to meet the post-1879 founding criterion (where n was equal to the total number of pages in the book divided by the number of firms sampled). A random number generator produces similar results.

[15]I began by testing for attachment at a few points throughout the period in an attempt to confirm the assumption that attachment status was constant throughout. Since this turned out not to be the case, I added intervening points. I am in the process of checking for interlocking directorates in the remaining years.

joint members found in the samples considered here were members of any *Vorstand*, the problem remains.[16] The *Adressbuch der Direktoren und Aufsichtsratmitglieder*, an alphabetical listing of all *Vorstand* and *Aufsichtsrat* members of firms traded in Berlin, lists all firms (in all sectors) on which each individual held a board position.[17] Like *Saling's,* the *Adressbuch* indicates the position held, but it does not give any indication of primary allegiance.

Tables IA-C give the average age as well as average and median paid-in capital for the three samples in each of the tested years. The variation in the numbers underscore the differences among the three datasets. The averages for sample III, because its selection was unconstrained, gives an idea of the average age and size of joint-stock firms (traded in Berlin) at several points throughout the period. The sample III data also allow a gauging of the magnitude of the bias introduced into samples I and II by their respective sampling criteria.

Given the sampling criteria, it is natural that, in each year, the long-lived firms of sample I are the oldest on average and the newly-public enterprises of sample II are the youngest.

TABLE IA
AGE AND PAID-IN CAPITAL: SAMPLE I

Year	Sample size	Mean paid-in capital (thousands of Marks)	Median paid-in capital (thousand of Marks)	Mean age (years)
1882	50	5,046.10	2,700	15.50
1894	50	6,882.98	3,440	27.50
1900	50	11,658.37	4,350	33.50
1905	50	14,102.14	4,849	38.50
1910	50	19,607.79	4,849	43.50

[16]In some cases, a bank name is listed in brackets next to the individual's name, but there is no explanation given. It is possible, but not verifiable, that the label distinguished official bank representatives from individuals with only a coincidental joint membership. Saling's also frequently indicates private banks in brackets after the representatives' names, but again it is not clear that all such associations are consistently given. Nonetheless, since private banks would not have had the joint-stock form, it is probably safe to assume that members for whom a private bank connection is indicated were primarily involved with the given bank. The role of private bankers is an important avenue for future research. See Wixforth and Ziegler (1994).

[17]That this addressbook of all board members and their affiliations only began publishing around 1899 is notable, because it fits with the suggestion that the organs of firm ownership and control were neither large nor highly complicated in the nineteenth century.

TABLE IB
AVERAGE AGE AND PAID-IN CAPITAL: SAMPLE II

Year	Sample size	Mean paid-in capital (thousands of Marks)	Median paid-in capital (thousand of Marks)	Mean age (years)
1882	3	1,803.33	810	0.67
1894	10	3,557.05	2,650	10.10
1900	25	4,797.62	3,000	9.52
1905	25	5,543.34	2,800	14.52
1910	21	5,893.50	2,500	19.14

TABLE IC
AVERAGE AGE AND PAID-IN CAPITAL: SAMPLE III

Year	Sample size	Paid-in capital (thousands of Marks)	Median paid-in capital (thousand of Marks)	Age (years)
1882	25	4,538.98	2,655	12.48
1886	25	4,094.46	2,520	12.64
1890	25	2,769.70	2,142	13.08
1894	25	5,071.20	2,200	15.48
1898	25	3,843.13	2,250	15.24
1902	25	4,360.07	2,550	15.12
1906	25	8,523.07	3,000	21.60
1910	25	14,619.48	4,047	21.32

Though the average paid-in capital of sample I firms is consistently several times that of the corresponding averages for sample II, the growth rate of average capitalization is similar for the two samples over the full period. In the case of Sample III, average paid-in capital appears steady--with the exception of a slight drop in 1890--for the twenty years between 1882 and 1902. The averages for 1906 and 1910 demonstrate distinct increases--with average share capital more than tripling in the eight years following 1902. Comparing median paid-in capital for the three samples, it is clear that there is less disparity in the firm sizes than is suggested by the sample means. Also, the means are uniformly higher for all years and all samples than the corresponding medians; reinforcing what is apparent from the firm-level data--that there are a few very large firms driving up the mean of paid-in capital.

The firms in Saling's are clearly not representative of all joint-stock firms, but the bias--particularly in the earlier years--is less extreme than might be expected. For example, data reported in Sombart (1913) on numbers of firms and their share capital, generates an overall average capital of 2,362 thousand Marks in 1901 and 2,299 thousand Marks in 1910.[18] The data was reported in *Der deutsche Ökonomist*, and apparently covers all joint-stock firms in industrial production. Thus, transport companies--many of which were large relative to the mean--were excluded. An estimate of average capital calculated from data in *Das Handbuch der deutschen Aktiengesellschaften*, a book similar to *Saling's* covering all joint-stock firms, produces analogous results for 1905. In that year, average capital for a random sample of 100 firms from the *Handbuch* was 4,271 thousand Marks, while the median was 1,122 thousand Marks.

The unsurprising inference is that Saling's--or more accurately, the Berlin bourse--tended to under-represent smaller firms. If the bias remained constant, then consistent overrepresentation of bank-attached firms would be likely, given the bias of the (great) banks toward involvement with larger firms. However, if this bias increased over time--which it may have done--then later years might oversample attached firms more than earlier years. Since the share of all joint-stock firms reported in *Saling's* fell faster before 1900 than after, and since the patterns of attachment reported below are similar for all three samples, regardless of the sampling criteria, it is doubtful that restricting attention to firms listed in Berlin can account for a significant portion of the increase in the occurrence of interlocking directorates demonstrated in this paper.

IV. Results

The tables below report three sets of indicators that illuminate the changes in interlocking directorates between 1882 and 1910. Part 1 reports the percent of the full sample as well as the share of attached firms that were involved in relationships with various types of universal banks. Part 2 presents data on the average size of firms' executive and supervisory boards and on the average overlap between bank and firm boards. The final part, part 3, gives the share of all firms and of attached firms with chair and vice-chair positions filled by concurrent bank board members.

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[18]The average for 1910 seems low, but I have no way of checking his figures with the data I have currently.

1. *Percent of firms with interlocking directorates*

The first part of Tables IIA through IIC gives the percentages of all firms with interlocking directorates in the various years tested. The second part of the table then gives a further breakdown of attached firms by bank type. Great banks are the following 9 banks: *Deutsche Bank*, *Dresdner Bank*, *Discontogesellschaft*, *Bank für Handel und Industrie*, *A. Schaaffhausen'scher Bankverein*, *Berliner Handelsgesellschaft*, *Commerz und Disconto Bank*, *National Bank für Deutschland*, and *Mitteldeutsche Creditbank*. All other joint-stock mixed banks are considered provincial banks.[19] Combined attachment (fourth and eighth columns) indicates the presence of interlocking directorates with both a Great Bank and a provincial bank. In some cases, one individual sat on several different bank boards in addition to the firm's board. In the three samples, cases in which such an individual was the only bank representative on the firm board are unusual but are nonetheless counted as combined attachment.

The fifth column in each table gives the percentage of the sampled firms with at least one concurrent bank board member (i.e., interlocked firms). In the four test years from 1894 on, Sample II has a slightly higher proportion of interlocked firms than Sample I, but--despite the age difference in the underlying populations--the two samples exhibit similar patterns of interlocking directorates over time.

TABLE IIA

PERCENT OF FIRMS WITH INTERLOCKING DIRECTORATES, BY BANK TYPE: SAMPLE I

	Percent of full sample				Percent of interlocked firms		
Year	Provincial banks	Great banks	Combined	Total	Provincial banks	Great banks	Combined
1882	8	4	0	10	67	33	0
1894	10	8	0	18	56	44	0
1900	20	8	4	32	63	25	13
1905	26	6	42	74	35	8	57
1910	30	12	38	80	38	15	48

[19]The specific category of banks used is called *Deutsche verschiedene Banken* in *Saling's*.

TABLE IIB

PERCENT OF FIRMS WITH INTERLOCKING DIRECTORATES, BY BANK TYPE: SAMPLE II

	Percent of full sample				Percent of interlocked firms		
Year	Provincial banks	Great banks	Combined	Total	Provincial banks	Great banks	Combined
1882	0	0	0	0	--	--	--
1894	20	0	0	20	100	0	0
1900	24	16	4	44	55	36	9
1905	28	20	36	84	33	24	43
1910	19	10	62	91	21	11	68

Differences between the two samples emerge in the breakdown of attachments by bank type. Summing columns three and four produces the percentage of firms with great bank connections regardless of the presence of a provincial bank. For the young firms of Sample II, the great bank share increased from zero to twenty percent from 1894 to 1900. In contrast, great-bank attachment among the older firms of Sample I rose only four points from 8 to 12 percent. By 1910, 72% of Sample II firms had interlocking directorates with at least one great bank, while 50% of Sample I firms were engaged in similar arrangements. The differences between the two samples in the shares of firms with great-bank and provincial-bank involvement suggest that there are particular firm characteristics that lead to bank involvement--whether initiated by the bank or the firm. For example, while the firms in sample II were certainly smaller on average than those in Sample I, it is possible that the newly-public firms were faster growing or higher profit than their older counterparts.[20]

One valid concern about the trend toward increased bank involvement found in the first two samples, is the possibility that attachment is correlated with age. Thus, as the firms in the samples age, they might be more likely to interlock their directorates. Given the wide range of ages in the samples in any given year, it seems doubtful that the aging of the firms could explain such a dramatic shift in attachment. Nonetheless, it is useful to compare the results for Samples I

[20]Firm-level analysis, a topic that is beyond the scope of the current paper, is the appropriate route to understanding the variation in attachment patterns between the two samples. This is discussed further in the following section.

and II to those for the eight independent, random cross sections in Sample III.

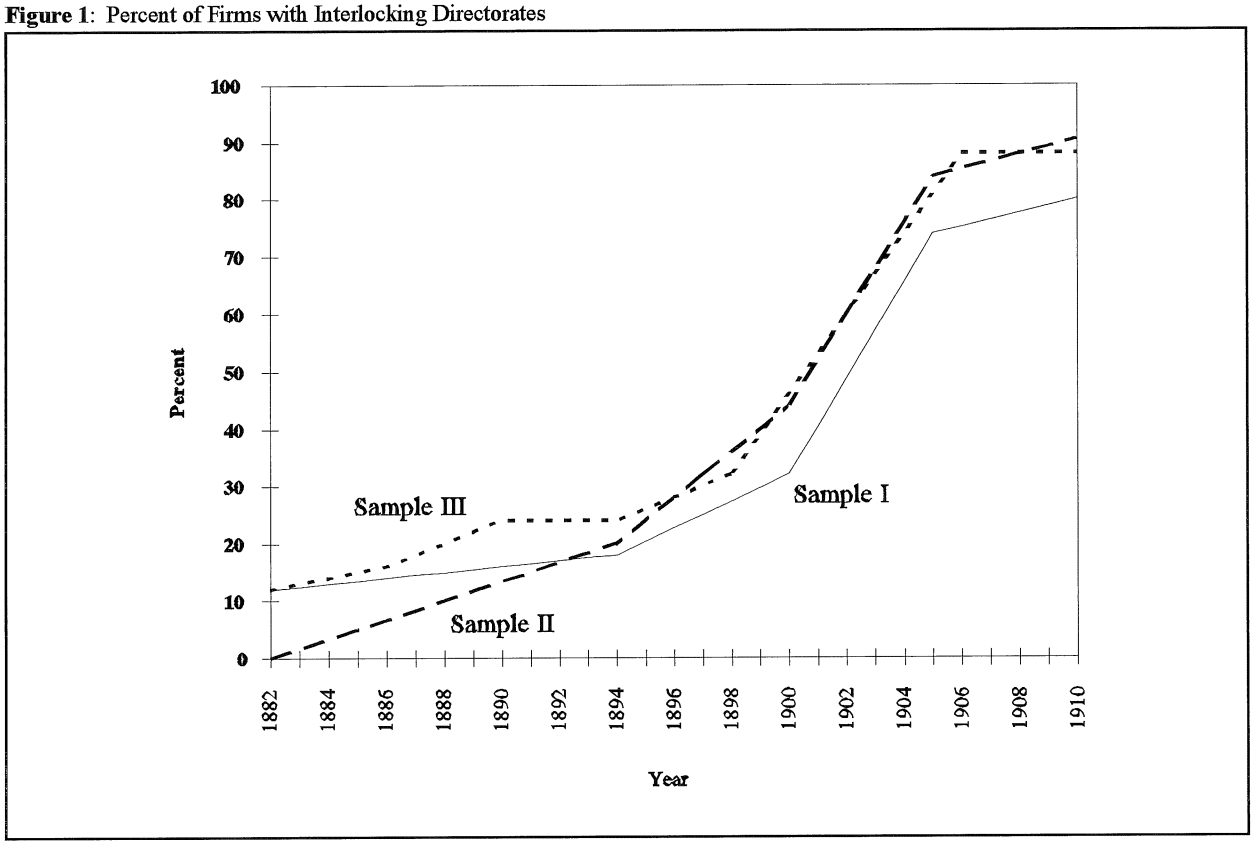
Sample III data are given in Table IIC, and the results for the three samples are plotted together on Figure 1. Because the eight samples are independent of one another, each provides a snapshot of bank-firm relations in the tested year. The share of firms with interlocking directorates follows the same course as the first two samples--running closer to Sample I in the earlier years and Sample II in the later years. The breakdown of interlocking directorates by bank type shows some variation among the samples, however, there does not seem to be any consistent bias in Samples I and II compared to Sample III.

TABLE IIC

PERCENT OF FIRMS WITH INTERLOCKING DIRECTORATES, BY BANK TYPE: SAMPLE III

	Percent of full sample				Percent of interlocked firms		
Year	Provincial banks	Great banks	Combined	Total	Provincial banks	Great banks	Combined
1882	4	8	0	12	33	67	0
1886	8	8	0	16	50	50	0
1890	16	8	0	24	67	33	0
1894	12	12	0	24	50	50	0
1898	16	4	12	32	50	13	38
1902	36	8	16	60	60	13	27
1906	48	8	32	88	55	9	36
1910	36	8	44	88	41	9	50

Figure 1: Percent of Firms with Interlocking Directorates



2. *Average board size and bank overlap*

Tables IIIA-C present data on the mean size of executive and supervisory boards, as well as the average number and share of joint bank members in those boards. Joint bank members are those individuals with positions on both the firm board and at least one bank board. Firms without bank representation are excluded from the calculation of means in order to avoid biasing these numbers downward in the early years, when most firms had no bank representation.

The data on executive board memberships is striking for the scarcity of interlocking directorates that it demonstrates--even in the later years. Before 1900, only one firm in any of the three samples had joint bank members on its executive board, and that firm was one of the older firms in Sample I. That sample shows a significantly higher percentage of interlocked executive boards than Samples II and III throughout the period. Nonetheless, a comparison with the supervisory board numbers makes it clear that the executive board was not the primary channel

for bank-firm relationships at any time during the period. For example, even in 1910, when 26% of Sample I firms had interlocked executive boards, 80% of the sampled firms had interlocked supervisory boards. Also notable is the finding that, almost without exception, the average number of joint executive board members was one--even as the average size of the boards grew.

TABLE IIIA
AVERAGE BOARD SIZE AND BANK OVERLAP: SAMPLE I

Year	Executive board (*Vorstand*)			Supervisory board (*Aufsichtsrat*)		
	Total number of members	Number with joint bank membership[a]	Percent interlocked with bank[b]	Total number of members	Number with joint bank membership[a]	Percent interlocked with bank[b]
		(for values > 0)			(for values > 0)	
1882	1.60	1	100	0.92	1	80
1894	2.18	1	100	1.24	1	79
1900	2.56	1	50	1.74	1.13	62
1905	2.82	1	52	7.58	3.70	39
1910	3.26	1	43	7.92	3.98	41

[a]Number of firm board members with concurrent membership on a bank board (*Vorstand* or *Aufsichtsrat*).
[b]Percent of board members with concurrent membership on a bank board (*Vorstand* or *Aufsichtsrat*). Both measures are calculated only for firms with a positive number of joint members.

TABLE IIIB
AVERAGE BOARD SIZE AND BANK OVERLAP: SAMPLE II

Year	Executive board (*Vorstand*)			Supervisory board (*Aufsichtsrat*)		
	Total number of members	Number with joint bank membership[a]	Percent interlocked with bank[b]	Total number of members	Number with joint bank membership[a]	Percent interlocked with bank[b]
		(for values > 0)			(for values > 0)	
1882	2.00	--	--	1.00	0	0
1894	1.30	--	--	1.40	1.00	35
1900	1.64	--	--	2.36	1.18	63
1905	1.76	1	58	5.92	1.90	35
1910	2.14	1	32	6.14	2.00	33

[a]Number of firm board members with concurrent membership on a bank board (*Vorstand* or *Aufsichtsrat*).
[b]Percent of board members with concurrent membership on a bank board (*Vorstand* or *Aufsichtsrat*). Both measures are calculated only for firms with a positive number of joint members.

TABLE IIIC
AVERAGE BOARD SIZE AND BANK OVERLAP: SAMPLE III

Year	Executive board (*Vorstand*)			Supervisory board (*Aufsichtsrat*)		
	Total number of members	Number with joint bank membership[a]	Percent interlocked with bank[b]	Total number of members	Number with joint bank membership[a]	Percent interlocked with bank[b]
		(for values > 0)			(for values > 0)	
1882	1.76	--	--	1.08	1.00	100
1886	1.80	--	--	1.04	1.00	75
1890	1.88	--	--	1.24	1.00	70
1894	1.64	--	--	1.48	1.00	59
1898	1.92	--	--	2.00	1.38	59
1902	2.12	--	--	5.56	2.07	31
1906	2.28	1.00	20	6.08	2.74	39
1910	3.04	1.50	29	7.04	3.00	35

[a]Number of firm board members with concurrent membership on a bank board (*Vorstand* or *Aufsichtsrat*).
[b]Percent of board members with concurrent membership on a bank board (*Vorstand* or *Aufsichtsrat*). Both measures are calculated only for firms with a positive number of joint members.

The data on the supervisory boards indicates a similar, if more extreme, increase in size and decrease in extent of interlocking (i.e., percent of boards made up of joint bank members) as that found for the executive boards. In contrast to the pattern for the executive boards, the average number of joint bank members in the supervisory boards increased noticeably after 1900.

For those interested in the relative power of the universal banks and industrial firms during this period, the data on executive boards should be particularly interesting. Since executive boards were made up of managers, it is likely that members of that body were associated primarily with the firm on whose executive board they sat. Therefore, executive board members with concurrent bank and firm affiliations were likely representatives from the firm to the bank. Under such assumptions, the rising share of firms with interlocking executive boards suggests growing power of industrial firms with respect to the banks and not the reverse.

The increase in the average number of joint supervisory board members--if the result of increasingly reciprocal representation--might also be construed as evidence of an expansion of the firms' influence. Furthermore, the rising numbers of joint board members often meant a concurrent increase in the number of banks represented at the firms (whether directly from the

bank or indirectly via other firm board members). It is easy to imagine that the value to the bank of information gathered would be diluted with the appointment of competitor banks' representatives. While the onset of multiple bank contacts may have been engineered by competing banks, it may also have been the work of the firms themselves--indicating further that firms were loosening the banks' grasp.[21]

3. *Banker-held board chairmanships*

Tables IVA-C present the final piece of evidence on the evolution of interlocking directorates around the turn of the century--the percentage of firms with bankers holding the chairmanship or the vice-chairmanship of the supervisory board. The first part of the table presents the percentages for the full sample, while the second part gives the shares for interlocked firms only. The trend is toward a growing share of all firms with the top supervisory positions held by concurrent bank board members, but a dwindling proportion of attached firms with these posts held by bankers.

TABLE IVA
BANKER-HELD SUPERVISORY BOARD CHAIRMANSHIPS: SAMPLE I

	Percent of sample with the following positions held by bank board member:			Percent of interlocked firms:
Year	Chair[a]	Vice-chair[b]	Both	Chair or Vice-chair
1882	1	0	0	83
1894	12	6	2	89
1900	12	16	2	81
1905	32	26	8	57
1910	42	28	18	65

[a]Chair of the supervisory board (*Vorsitzender des Aufsichtsrat*)
[b]Vice-chair of the supervisory board (*Stellvertretender Vorsitzender des Aufsichtsrat*)

[21]It is not the goal of this paper to resolve the debate over the power of the universal banks. On *Bankenmacht*, see one of the original critics, Hilferding (1910), as well as the modern reexaminations by Wellhöner (1989) and Wixforth and Ziegler (1995).

TABLE IVB

BANKER-HELD SUPERVISORY BOARD CHAIRMANSHIPS: SAMPLE II

	Percent of sample with the following positions held by bank board member:			Percent of interlocked firms:
Year	Chair[a]	Vice-chair[b]	Both	Chair or Vice-chair
1882	0	0	0	--
1894	20	0	0	100
1900	28	4	0	73
1905	52	20	12	71
1910	48	19	6	58

[a]Chair of the supervisory board (*Vorsitzender des Aufsichtsrat*)
[b]Vice-chair of the supervisory board (*Stellvertretender Vorsitzender des Aufsichtsrat*)

TABLE IVC

BANKER-HELD SUPERVISORY BOARD CHAIRMANSHIPS: SAMPLE III

	Percent of sample with the following positions held by bank board member:			Percent of interlocked firms:
Year	Chair[a]	Vice-chair[b]	Both	Chair or Vice-chair
1882	12	0	0	100
1886	8	8	0	100
1890	24	0	0	100
1894	16	8	0	100
1898	24	12	4	100
1902	28	16	4	67
1906	48	40	24	73
1910	48	40	24	73

[a]Chair of the supervisory board (*Vorsitzender des Aufsichtsrat*)
[b]Vice-chair of the supervisory board (*Stellvertretender Vorsitzender des Aufsichtsrat*)

Though the share of attached firms with bankers in top positions was apparently in decline, the overall percentage remained strong throughout the period--averaging approximately 68 percent for all samples from 1900 on. As in the case of the data on board representation in general, it is not possible to determine with certainty that the individuals holding the concurrent bank and firm positions were emissaries from the bank to the firm. Therefore, it is difficult to

draw any conclusions about changing bank influence from these numbers.

The findings in these as well as the earlier tables indicate rapid growth in the number and extent of interlocking directorates around 1900. The remainder of this paper compares the specific findings to those that would be anticipated based on existing research and offers several explanations for the apparent deviations from expectations.

V. Interpreting the results

1. *Results vs. expectations*

The empirical investigation above uncovers several patterns in the size and shape of firm supervisory and executive boards; many of which run counter to the conventional wisdom on German universal banks and their operations around the turn of the century. The following five sub-sections compare the main findings to the expected results.

A. Increasing share of firms with interlocking directorates with banks

The main result--that interlocking directorates were not pursued to a great extent before 1900 but expanded rapidly thereafter--is surprising. Conclusions of earlier writers on the subject--from Jeidels, Riesser, and Sombart to Schumpeter and Gerschenkron--have impressed modern researchers with the importance of bank representation in the financing of industrialization during the nineteenth century. Also, one could reasonably assume that as industrial development progressed into the twentieth century, the need for close bank involvement would diminish, not grow.

B. Increasing size of firm boards and decreasing share of interlocked boards' positions held by joint bank members

The expansion of firm boards in general does not come as a surprise, when the growth in average paid-in capital is considered. In general, as the share capital grew, the number of shareholders requiring representation also rose. The declining share of each board's positions held by a concurrent bank board member follows directly from this increase in the size of boards.

C. Rising number of joint board members on firms' board; increasing share of firms with interlocking directorates with multiple banks; and decreasing share of firms with great bank-only or provincial bank-only connections

Bankers may not have been able to keep up with the growth of supervisory boards, but the average number of joint positions did increase noticeably. Furthermore, the share of firms with interlocking directorates with multiple banks increased--resulting in a smaller share of firms maintaining ties with only great banks or only provincial banks. It is difficult, however, to know what to make of the findings on the changing composition of firms' supervisory boards. On the face of it, an increasing number of bank ties gives the impression of proliferating bank relationships. Yet there are several reasons--discussed in section b--to believe that these findings are indicative of decreasingly-close bank ties. If true, and bank ties were becoming looser, then the results are in line with the expected decline in the importance of bank-firm relationships over the course of development. Some alternative explanation for the expansion of interlocking directorates would then be needed.

D. Increasing share of firms with banker-held chair or vice-chair and decreasing share of attached firms with banker-held chair or vice-chair

The percent of sampled firms with (apparently) banker-held chairmanships rose after the turn of the century. As a share of interlocked firms, the number of firms with bank board members in the top positions was actually declining, yet the level remained high throughout the period. Like the increase in the number of banks represented in firms' supervisory boards, the changes in the proportion of firms with banker-held chairs or vice-chairs has multiple interpretations with respect to the relative power of banks and firms. However, if we ignore the questions of power and representation, and instead focus on the number of interactions between banks and firms, then the volume of new relationships implied by these findings is impressive. Unless they were initiated for reasons other than those normally associated with the German bankers (that is, other than to allow the banks to monitor their investments in firms), a burst of new relationships after the main thrust of industrialization had passed would not be expected.

E. Increasing share of firms with interlocked executive boards

One final piece of evidence on the evolution of the corporate governance structure of German firms is the changing shape of firm executive boards. The growing independence of firms after 1900 that might be suggested by the increased share of firms with interlocked executive boards is only surprising to those who continue to believe that firms were dominated by banks into the twentieth century. However, relative to the supervisory board, the executive board has attracted little attention from contemporary commentators or modern researchers (perhaps precisely because of the assumption that firms would not have exercised that kind of power). Thus, there is no consensus on the role of the *Vorstand* in the development of firm-bank relationships in the *Kaiserreich.*

2. *Explaining the contrary findings*

There are several possible interpretations for the seemingly contrary results presented in this paper: 1. pre-1900 board interaction has been underestimated, 2. post-1900 board representation by banks has been overstated, or 3. the historiographical emphasis on interlocking directorates has been misplaced. That is, the practice of interlocking directorates may have developed in response to changes in German corporate and economic structure around the turn of the century and may have therefore played a far weaker role in the primary push to industrial development than has thus far been conjectured.

A. Undercounting of interlocking directorates through 1900

The possibility that board membership is underestimated is a real one. *Saling's* consistently lists the chair and vice-chair (if present) throughout the period, but in some cases it appears likely that it omits the other members of the supervisory board. For A.E.G., for example, only the chair (which was vacant at the time) and the two vice-chairs were listed in 1900, while 9 other members were mentioned in 1901. Thus, the count of the *Aufsichtsrat* members would

increase from 2 to 12 within one year--an unlikely scenario.[22]

There are several factors that mitigate the problem of underestimating pre-1900 representation. To begin with, A.E.G. is hardly representative of the population, and so the undercounting of board members would be exaggerated if based on this type of firm. Furthermore, while the exclusion of non-chair members certainly biases downward the average size of supervisory boards through 1900, it causes significantly less trouble with the estimates of the share of firms with any bank involvement. Throughout the post-1900 period--that is, even after the full boards began to be reported--a high percentage of firms with interlocking directorates maintained a bank connection in the chair or vice-chair position. Since the chair and vice-chairs were always reported, a high percentage of the firms with bank attachments will have been identified--even if additional bank connections for these firms have been overlooked. Based on the post-1900 average of the shares of interlocked firms with banker-held chair or vice-chair--approximately 68%--the pre-1900 shares of firms with bank interaction should be increased by as much as 20 points. Table V gives the shares of the three samples with any bank attachment, in which the shares for years through 1900 are adjusted using the assumption of 68% banker-held chair or vice-chair. While the adjustments do flatten the trend by raising the shares of attached firms in the earlier years, the pattern of significant increases in interlocking directorates throughout the period remains.[23]

The major effect of the likely undercounting of supervisory board members is thus felt in the estimates of supervisory board size and shares of supervisory chairmanships held by

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[22]The size of the banks' supervisory boards is likewise underestimated. It would be impossible, given the data I currently have, to estimate the extent of this bias. However, if we are mainly interested in the representation by those with the most influence at the bank, perhaps restricting attention to executive board members and supervisory chairs and vice-chairs is appropriate.

[23]These calculations are based on the assumption that the share of attached firms whose supervisory chair or vice chair was held by a banker board member was approximately the same before 1900 as after. If the actual percentage were significantly lower, then the estimates here would continue to understate the representation of banks in the early years. However, for there to be no change in the share of bank-interlocked firms over the years before 1901 (that is, to remain at the 1905 level of 74%), thirty-two attached firms would have to have been overlooked in 1882. This would imply that only 10.8% of attached firms had a banker-held chair or vice-chair. In 1900, the corresponding numbers would be 21 overlooked attached firms, and 35% banker-held chair or vice-chair. On the other hand, the true share of banker-held chairmanships might also be higher in the early years than later, in which case the adjusted data would overstate the extent of interlocking directorates in the early years.

concurrent bank board members. It may also underestimate the share of firms with multiple-bank contact in the years close to 1900. Given the data available, it is nearly impossible to measure any of these effects accurately.

TABLE V
PERCENT OF FIRMS WITH INTERLOCKING DIRECTORATES--THROUGH-1900 ADJUSTED

Year	Sample I	Sample II	Sample III
1882	15	0	18
1886			24
1890			35
1894	27	29	35
1898			47
1900	47	65	
1902			60
1905	74	84	
1906			88
1910	80	91	88

B. Overcounting of interlocking directorates after 1900

In contrast to the difficulties of the data through 1900, there is no evidence that post-1900 levels of interlocking directorates are over-estimated. However, one possible explanation for the seeming explosion in bank representation is the difficulty in determining whether directors found on the boards of both a bank and a firm were agents of the bank or the firm. The extent to which banks sent representatives to firms may therefore be over-estimated. Whale warned of this confusion: "Particularly misleading results are obtained when the industrialists sitting on bank *Aufsichtsräte* are regarded as bank directors and then all their connections represented as ramifications of the banks' interests."[24]

The confusion arises when an individual is a board member at two or more firms and at a bank. If his primary allegiance is to one of the firms, then his presence on the board of the other

[24]Whale (1930), p.51.

firms may be mistaken as representation by the bank on whose board he sits. However, it is doubtful that this problem is so extreme as to explain the full increase in the percentage of firms with interlocking directorates with a bank after 1900. Furthermore, firm representation at a bank without reciprocity would have been unusual, and the presence of an industrialist on a bank board of directors is still an indication of a connection between the two entities. Thus, the counting of firm representatives causes problems only for those concerned with issues of bank power more than with transmission of information between investors and savers.

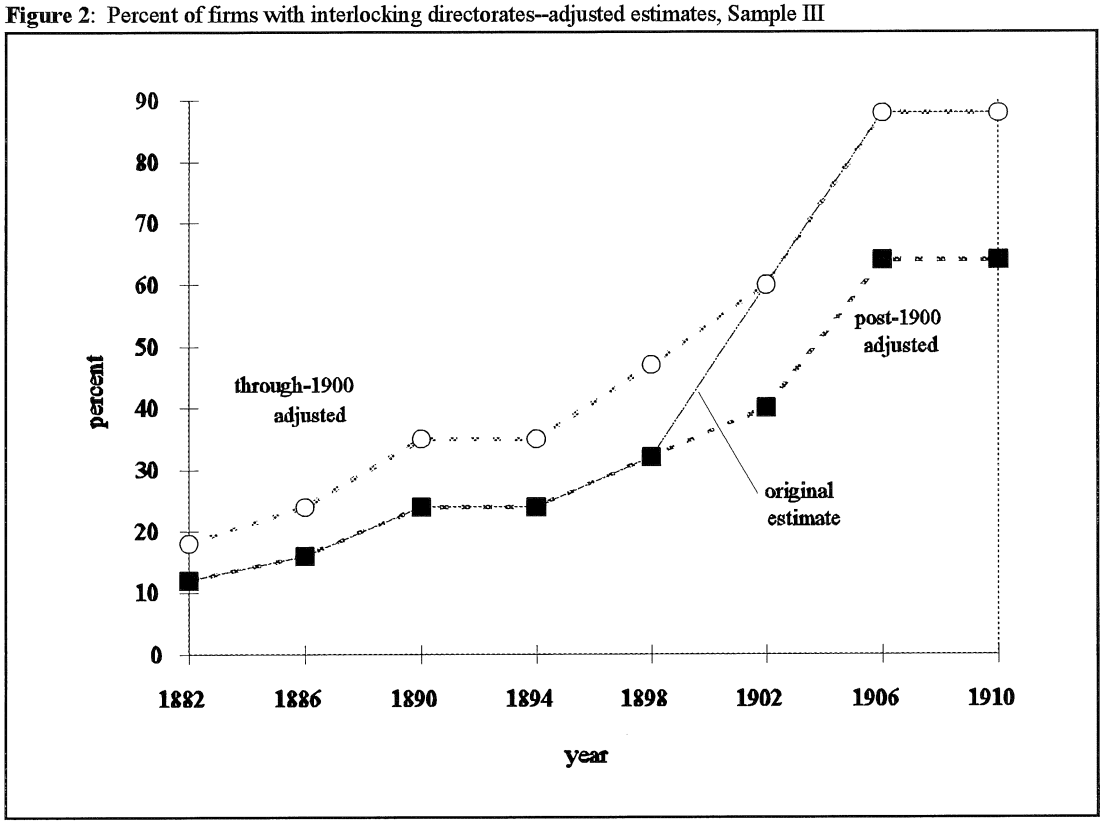
Nonetheless, it would be interesting--if only out of curiosity--to determine the prevalence of firms with board representation by an industrialist who also sits on a bank board, but without any direct connection to a bank. Answering this question in any general manner would be nearly impossible. One approach for the samples used in this paper is to restrict attention to the executive boards and supervisory chairs and vice-chairs in determining the interlocks between the banks and firms. Since these are apparently the only positions reported for the years before 1901, only the shares for the post-1900 period need recalculating.

The adjusted shares of firms with interlocking directorates are reported in Table VI. As with the recalculations in Table V, the trend is flattened, but the overall tendency toward an increasing share of firms with interlocking directorates remains. The two adjusted series for Sample III are plotted with the original estimates in Figure 2.

TABLE VI
PERCENT OF FIRMS WITH INTERLOCKING DIRECTORATES--POST-1900 ADJUSTED

Year	Sample I	Sample II	Sample III
1882	10	0	12
1886			16
1890			24
1894	18	20	24
1898			32
1900	32	44	
1902			40
1905	43	60	
1906			64
1910	52	53	64

Figure 2: Percent of firms with interlocking directorates--adjusted estimates, Sample III



C. Importance interlocking directorates in the nineteenth century has been exaggerated

The share of firms with interlocking directorates appears to be underestimated in the early part of the period and perhaps slightly over-estimated in the later part, yet the trend toward increasing interaction among bank and firm boards remains. Therefore, the most compelling explanation for the surprising patterns found here is that previous work has overstated the importance of interlocking directorates at the end of the nineteenth century and has perhaps misinterpreted their role in the first part of the twentieth century. Two factors have contributed to this problem. First, most investigations into the practices of German banks have been based on the experiences of a small number of high-profile firms--Siemens, AEG, Deutch-Lux, for example--and an elite group of industrialists--Stinnes, Rathenau, Hansemann, and others. Their experiences may not generalize well to the remainder of the population.

Second, modern notions of the importance of universal banking have been heavily

influenced by a small, and probably biased, body of literature. The historiographical lineage can be traced back through Gerschenkron (1962) and Schumpeter (1939) to Riesser (1910) and Jeidels (1905), among others. Jakob Riesser was a well-known Great Bank director, and his 1910 work is the most comprehensive treatment of the subject in English (or German). For both reasons, his work has heavily influenced several generations of historians and economists--particularly in the United States. While his analysis is accurate for a portion of German firms in particular sectors over a limited period of time, his conclusions may no longer hold when extrapolated, as they have been, to cover a wide assortment firms and industries since the middle of the nineteenth century. Furthermore, repeated quotation and interpretation has tended to broaden and exaggerate his original meaning. Riesser does not dwell on the early part of the *Kaiserreich*, and he avoids drawing causal links between bank practices and industrialization. In fact, in describing the development of the Deutsche Bank, he supports the findings of this paper: "The systematic development of its industrial policy began with the 'bold move' of 1897. During the first two decades, however, the bank did little or nothing toward extending its industrial connections through the founding or transforming of industrial enterprises."[25]

The essence of both explanations is the same: past investigations have been narrow in scope, have exaggerated or misinterpreted the contemporary sources, and have interpreted their conclusions too generally. If the biases of previous work are considered, the implications of this paper seem less surprising or controversial.

Finally, though we can be confident that a shift in policy occurred, the reasons behind this phenomenon are as yet unexplained. Though continued work on this subject is required to form any definitive conclusions, the following observations may shed some light on the question and may even offer plausible interpretations of the current findings.

i. complexity of financial markets and firm structure

One possibility is that increasing complexity of financial markets at the turn of the century--including the expansion of alternative sources of investment funds, growing internal finance by

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[25]Riesser (1911), p. 476. The 'bold move' of 1897 apparently refers to the launching of Siemens as a joint-stock company, in parallel with a large construction project for the Berlin Hoch- und Untergrundbahn.

firms, a more sophisticated investing public, and stock market crashes and economy wide crises in the early 1890's and in 1901--created vigorous competition among banks. Competition, in turn, may have led to a perceived need for direct, formalized control via the supervisory board. It probably also led to attempts to reduce competition. For example, communities of interest (*Interessengemeinschaften*)--which were often effected through share swaps (and thus board representation) increased from 2 at the start of 1897 to 9 at the end of 1900 and to 41 by the end of 1908.[26] The timing clearly coincides with that of the increases in interlocking directorates found in the present samples.

Also at the turn of the century, the evolution toward the modern enterprise became quite pronounced: scale, product diversification, and functional integration all increased. Of the largest 100 German firms in 1887, only 36 were engaged in 5 or more product groups, whereas in 1907, this number had risen to 51. Similarly, the number of firms involved in marketing or in cartels as well as in production or raw materials grew from 13 to 64 between 1887 and 1907. Also, the share capital of the top one hundred firms ranged from 3.8 to approximately 40 million Marks in 1887, but varied from 10 to 180 million Marks in 1907.[27]

Furthermore, the most highly-diversified firms were in the sectors in which the great banks were concentrated (except for mining firms, which were mostly involved in 1-4 product groups). For example, 45 out of the largest 48 firms in metal, machinery, and electrotechnical manufactured 5 or more types of products. In contrast, 14 of the top 17 chemical firms, and all of the largest companies in textiles, paper, printing, food and beverages, produced 4 or fewer products.[28] Firms that were highly diversified may have presented more opportunities for information asymmetry, and thus more need for bank relationships, than single-product firms.

These organizational and operational changes led to a more hierarchical corporate structure, which brought with it salaried managers and the separation of ownership and control. The transformation may have also had important implications for corporate finance and the

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[26]Riesser (1911), p. 664. See also Pohl (1982).

[27]From Kocka and Siegrist (1979) pp. 80-81. See also Kocka (1978) on the changes in German corporate structure at the turn of the century.

[28]Calculated from Kocka and Siegrist (1979), p. 81.

relationships between firms and banks: increasing financial independence and organizational complexity may have hampered the banks' ability to monitor firms effectively, especially in the absence of board representation.

While the forgoing scenarios seem plausible, they fail to explain why--if industrial firms were becoming increasingly independent of banks--the banks would be able to wrestle away board seats from unwilling firms. Perhaps board membership was not an issue of power after all. Clearly representation flowed in both directions--to and from the banks. Thus, reciprocal board memberships may have arisen out of the desire for mutual oversight and enforcement of long-term relationships (much like the *Interessengemeinschaften* among the banks). For example, Whale (1930) comments in the context of relations between the great banks and provincial banks, that great banks placed representatives on the boards of the smaller banks "to give the arrangement a measure of permanence."[29]

ii. the concentration movement

A second explanation for the growing prevalence of interlocking directorates around the turn of the century may be the concentration movement. The great banks have often been assigned credit (or blame) for orchestrating mergers or other combinations from their positions of power in a multiplicity of firms. More specifically, the argument would be that the banks took seats on several firms in an industry in order to permit monitoring and enforcement of cooperative agreements.

Besides the inconsistency that firm power seems to have been growing (although one could counter that firms were purposely tying their own hands by inviting bank oversight), there is an additional flaw in this argument. If banks were needed to enforce cartel arrangements in any sector, it would seem logical that they would prove most crucial in industries in which self-monitoring was the most difficult--for example, competitive, homogeneous goods-producing sectors. Banks would not offer the greatest disciplinary benefits to heavy industry or electro-technicals--sectors that represented a small fraction of all German firms, but whose average

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[29]Whale (1930), p. 29.

share-capital was among the highest.[30]

If growing board representation were seen as the result and not the cause of concentration, then the contemporaneous increases in concentration and interlocking directorships in heavy industry would make more sense. Combinations among mining and metal or electro-technical firms often required major financial backing, and the banks involved often garnered board seats because of their financial participation. Indeed, in several well-known cases the great banks played important roles, yet this does not imply that the banks instigated or enforced the combination.[31] Riesser (1911) recounts the backing of the L. Loewe Group by the Disconto Gesellschaft consortium of banks in 1900:

> "It appears that since the nineties the ever-increasing extension of the plant and the annexing of a number of hitherto independent concerns made it impossible to have the largely increased demands for capital met either by the original firm of by any single banking institution, the latter partly for the reason that a number of banking institutions were simultaneously interested in several enterprises of the electro-technical industry."

The backing of industrial groups--operations that clearly encouraged multiple bank contact--were not common until the very end of the nineteenth century and into the beginning of the twentieth; providing further support for the finding that in all three samples interlocking directorates with a variety of banks increased rapidly after the turn of the century.

iii. signalling and proxies

The first two explanations for the expansion in interlocking directorates center around issues of monitoring, but there are other possible reasons for the observed patterns. For example, firms may have found it useful for attracting investors to have well-known bank directors on their boards. A banker's presence may have served as a seal of approval--signaling the firm's quality to the market. To account for the trend toward greater bank-firm interaction, however, the importance of reputation would have to have been increasing over the period.

Finally, even ignoring reputation effects, the simple fact that shareholders often gave their proxy to a bank may explain part of the apparent increase in bank-firm interaction. The more

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[30]See Sombart (1909, 1913, 1927) and Wagon (1903).

[31]See Wellhöner (1989) on the cases of several major firms in heavy industry.

firms with the joint-stock form, and the larger the firms' share capital, the greater the potential was for large numbers of shareholders to turn over their voting rights to banks.

The rapid growth in the number and size of initial public offerings around the turn of the century, and the concomitant demand for quality signaling and proxy votes, might explain part of the increase in interlocking directorates. Table VII illustrates this point. According to these figures, joint-stock capital floated between 1895 and 1901 tripled that which was issued in the previous twenty years.

TABLE VII
JOINT-STOCK FLOTATIONS, 1888-1895

Years	Total firms floated	Average share capital
1874-1894	122.38	890.48
1888-1894	179.14	894.29
1895-1901	244.14	1,392.86

Source: *Deutscher Ökonomist*, as cited in Riesser (1911). *Handbuch der deutschen Aktiengesellschaften* gives similar, though not identical, numbers for 1899-1911.

VI. Conclusions

This paper has shown that the institution of interlocking directorates was a dynamic one in Germany over the thirty years around the turn of the century. The data demonstrates marked growth in the formalized interaction between banks and industrial firms toward the late nineties and after 1900--a trend that runs counter to the generally-accepted assumptions about the role of the universal banks in the German industrialization.

In order to determine which of the foregoing hypotheses provides the best explanation for the patterns of interlocking directorates uncovered in this paper, further research is needed. Particularly useful might be case studies of several (perhaps randomly-selected) individual firms that entered into interlocking directorates with one or more banks during the period. At a general level, limited dependent variable methods would likely provide a more detailed understanding of the characteristics--including size, sector, location, and capital requirements--of firms that had

interlocking directorates with banks.[32] Also, since the firms discussed here were sampled from those traded in Berlin only, the potential overcounting of bank relationships in the full population of joint-stock firms should also be investigated. Investigation into the corporate governance of unlisted firms might prove especially fruitful.

Many of the proposed justifications for increasing bank-firm interaction relate to economic changes outside of the control of banks--suggesting that further investigation into the potentially-changing function of interlocking directorates is also warranted. For example, the notions that bank-firm relationships reduced asymmetric information and permitted more efficient investment, or that long-term relationships committed banks and firms to act in the interest of the long-term despite short-run costs, may be called into question.[33]

A related question, deserving of close scrutiny, is that of the role of informal relationships between financiers and industrialists in the mid- to late-nineteenth century. While familial or social ties are exceedingly difficult to spot and quantify on a comprehensive scale, we may find that they were more important to nineteenth-century German industrialization than the legal relationship represented by *Aufsichtsrat* representation. If this is the case, then it casts doubt on the principal that universal banking--and the specific legal structures of which the system was comprised--was the key to German industrialization.

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[32]LDV analysis for Samples I and II is provided in Fohlin (1994a).

[33]On bank attachment and firm liquidity constraints, see Fohlin (1994b).

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