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Abstract

Large universal banks played a major role for Germany's industrialisation because they provided loans to the industry and thereby helped firms to overcome liquidity constraints. Previous research has also argued that they were equally important on the German stock market. The present paper provides quantitative and qualitative evidence that although the market for underwriters was dominated by a small oligopoly of six large banks, there was still perceptible competition, which kept fees and short run profits low. Another interesting finding of the paper is the absence of a signalling effect to investors. Neither underpricing nor the one year performance was different for the IPOs issued by one of the *Big Six*. Thus, although the German IPO business was in the hands of a small oligopoly, investors did not benefit from the lack of competition. One explanation is that the quality of IPOs on the German stock market of the time was very good in general caused by the competition between underwriters, but also by the tight regulation of underwriting, which ensured the quality of all firms on the German stock market.

JEL codes: G21, G24, N23

Keywords: Financial History, Universal Banks, IPOs

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Introduction

The classical view, associated with Gerschenkron, is that the peculiar character of Germany's financial institutions played a critical role for her industrialisation and for the fact that Germany overtook England in the late 19th century.[1] However, one main argument against this view is that banks only became influential after the industrialisation and their impact on the actual take off was therefore limited.[2] Moreover, a prominent study by Neuberger and Stokes provides empirical evidence that the influence of large credit banks on economic growth was indeed negative.[3] The results of their analysis, too, have been disputed.[4] More recent empirical research, based on better data and longer periods, provides evidence supporting the hypothesis that banks had a positive impact on industrialisation. Burhop, for instance, showed that total assets of credit banks were positively correlated with capital accumulation in the industrial sector until the mid-1880s.[5] Compatible with this finding is his observation that up to the 1880s banks screened and monitored the market for loans. In the 1890 this influence diminished but an important signalling function remained.[6]

[1] Gerschenkron, *Economic Backwardness,* and *Europe in the Russian Mirror*. One reason is, for instance, the emergence of formal relationships between universal banks and nonfinancial firms, a typical feature of which was the appearance of bankers in supervisory boards of non-financial firms. In this way, banks acquired a high degree of control over industrial enterprises. They used the information to give long-term funding of potentially risky investments in high-growth, capital intensive industrial branches. See Tilly, German banking, 113-152.

[2] Edwards and Ogilivie,'Universal banks'. Tilly claims for instance that private banks in the Rhineland already began to develop universal banking in the 1820s, that is, long before industrialisation got under way. Tilly, *Financial Institutions.*

[3] Neuberger and Stokes, 'German Banks and German Growth'

[4] See for instance Tilly and Fremdling, 'German Banks, German Growth and Econometric History' and Komlos, 'The Kreditbanken'.

[5] The idea behind his approach is that banks could provide loans to the industry below market interest rates to support industrial growth. Then, in the moment of take-off, they could increase interest rates to balance the previous subsidy. A precondition of this strategy was a sufficient concentration of market power, which diminished in the 1870s when more banks entered the market. Burhop, 'Industrialisation'.

[6] Burhop, 'Aufsichtsräte'.

In the late 19th century the stock market more and more replaced loans as a major source of capital for industrial firms[7]. The question is whether large banks could transfer their influence from the market for loans to the stock markets. According to Burhop there is no such evidence in the early phase of the stock market from 1870 to 1896.[8]

This leads to a slight modification of Gerschenkron's Hypothesis: Did the large German banks indeed shift their strong position from the market for loans to the stock market, (even if this became perceptible only after 1896), thereby still playing a critical role for firms to overcome liquidity constraints and thus for Germany's industrialisation? And furthermore, did the fact that large banks underwrote issues have a positive signalling effect for investors?

These questions will be tested based on a substantial amount of newly collected qualitative and quantitative evidence.[9] In a famous article De Long points out that the USA and Germany had qualitatively superior capital markets than England, which were responsible for England falling behind. His main argument is that securities issues and investment banking business in the US and in Germany were concentrated in the hands of very few investment bankers and the investors benefited from the lack of competition.[10] He argues that although J.P. Morgan, one of the biggest actors in the US, exploited their position by for instance charging high fees, the negatives of financial capitalism were outweighed by positives. The argument goes as follows: The market did

[7] In 1913, the ratio of commercial and savings deposits divided by GDP was 0.53. See Rajan and Zingalis 'The great reversals', p.14.
[8] Burhop, 'Aufsichtsräte' and Burhop, 'Underpricing'.
[9] Qualitative information was taken from the Historical Archive Deutsche Bank (HADB), the Archive of Sal Oppenheim (a Cologne-based private bank) and the files of the Berliner Handelsgesellschaft, stored in the Bundesarchiv (BA). The quantitative analysis is based on data from Vierteljahrshefte zur Statistik des Deutschen Reichs. According to an act of the German parliament from June 1896, all IPOs and SEOs had to be published in an official statistical record. The publication includes the date of the issue, the name of the firm, that of the underwriter, the offering price if existent and the size of the issue. For the present paper, these records have been used to compile a data set that includes detailed information about market shares for underwriter services, how they developed over time, and about the frequency of activity in the market for IPOs, their sizes and sectoral structure.
[10] De Long 'Morgans's men', p.205.

discipline the Morgan partnership and other large banks in the long run. He reasons that Morgan and company were able to keep doing deals and charging high fees, because of their high reputation for good judgment and identifying firms with good performances. Preservation of this reputation was the primary goal of the partnership and kept it from abusing its short run market power by leading its clients into unsound deals.[11]

Hannah has recently questioned De Longs point that underwriters with small market shares in a highly competitive market expect their future returns from a reputation as an honest broker to be small and that they therefore have a higher incentive to exploit the market for short run profits. He suggest that this - unrealistically - implies that London Bankers did not care for their long-run reputation as issuers, and that British Business owners were dissuaded from IPOs by London's competitive and therefore cheap financial intermediation.[12]

What does this imply for the German IPO market? According to De Long's argument, large banks and investors would have benefited from a lack of competition, since the market was dominated by a bank monopoly or a bank cartel, which would have had an incentive to signal high quality issues in order to keep their reputation in the long run. The first section of the paper provides qualitative and quantitative evidence that large prestigious banks were indeed important in the process of going public on the German stock market in the period from 1896 to 1913. However, in contrast to the US, the German stock market was not monopolised by one bank or a banking cartel. There was a small oligopoly at the top of the market, which consisted of the six banks that had

[11] Ibis. p. 232,233.
[12] He further supports his view by showing that De Longs analysis lacks convincing statistical evidence – of which De Long himself admits in his paper the conceptual inadequacy and insignificance. Hannah, 'J.P Morgan. P. 142.

equity capital exceeding 100 Million Marks[13]: Deutsche Bank, Dresdner Bank, Diskontogesellschaft, Darmstädter Bank (the "D-banks"), A. Schaaffhausenscher Bankverein and the Berliner Handelsgesellschaft.[14] Except for A. Schaaffhausenscher Bankverein, by the beginning of the observed time period they all had their headquarters in Berlin.[15] The five largest of them also formed interest groups with other banks, either through share holdings (the large banks simply owned parts of smaller banks), or through contracts, which will also be considered.[16]

The six largest banks, however, did not seem to operate as a cartel. Evidence provided in section 3 to 5 suggest that there was perceptible competition between them.

If De Long is right and investors in the US got a fair deal, the initial returns were high to the disadvantage of owners of firms, who were in addition charged with high fees. Thus the incentive for firms to go public at the US stock exchange must have been limited - which it was as indicated by the relatively low number of firms going public in the US.[17] If banks in Germany had acted similarly, we would observe substantial underpricing and high fees on German stock markets as well. However, as shown in section two, underpricing was low. Furthermore we also would observe high fees for firms going public, which we also cannot find conclusive evidence for (section three). Thus, while in the US the firm owners were the losers of the process, in Germany the competition in the oligopoly kept underpricing and fees low. Thus, while firm owners seemed to get fair deals, investors might have been the losers of this system. This is

[13] Market capitalization is often used to measure reputation in a modern setting, see Michaely and Shaw, 'The pricing'.
[14] Riesser, *Die Deutschen Großbanken,* pp. 519.
[15] Darmstädter Bank was founded in Darmstadt, Dresdner Bank in Dresden, and A. Schaffhausenscher Bankverein in Cologne. However, early after the foundation of the Reich they opened branches in Berlin (Damstädter Bank in 1871, Dresdner Bank in 1884 and A. Schaffhausenscher Bankverein in 1891) and moved their headquarter in the following years from their traditional places towards Berlin. A. Schaffhausen'scher Bankverein, however, kept the headquarter in Cologne, although the Berlin branch became more influential over time. See Riesser, *Zur Entwicklungsgeschichte,* p 242.
[16] See Riesser, *Die deutschen Großbanken*, pp. 520.
[17] Hannah *'Global equity markets in 1900'*

further supported by the absence of a signalling effect: Neither the initial returns were higher for IPOs issued by large prestigious banks nor did they perform better than IPOs issued by smaller banks in a one year period.

The strong and fast development of the German stock markets, however, implicitly provides evidence that investors still had incentives to invest- although short run profits were marginal. The quality of IPOs on the German stock market of the time might have been very good in general caused by the competition between underwriters, who all tried to build up a good reputation by carefully choosing promising firms and reject to underwrite less promising ones, but also – and this seems the most likely - by the tight regulation of underwriting, which ensured the quality of all firms on the German stock market.[18]

The IPO business and the importance of firm-bank relationships

The German stock market law of 1897 regulated the criteria a firm had to fulfil in order to go public. First, a firm had to be a joint stock company. Firms that got listed could therefore either be newly incorporated, or they were transformed into a joint stock company, if they had already existed in another corporate structure before.[19] Thus, during the process of being listed, they had to reveal their financial standing and other general features twice: once before they got incorporated and once before they went public.[20]

[18] Burhop, Chambers and Cheffins, 'Regulation'.
[19] For different types of corporate forms see Guinnane, Harris, Lamoreaux and Rosenthal, 'Corporation'.
[20] See §§ 186, 191, 193, Handelsgesetzbuch des Deutschen Reichs 1897.

After a firm's foundation or transformation, its information was checked by an independent expert, and after it had passed this check-up, it had to be officially registered in the commercial register.[21]

In order to go public, the firm itself, or a bank on behalf of the firm, had to apply to the exchange admission board. In this process, it had to publish a prospectus, where all information needed to evaluate the issue was made available to possible investors. The exchange admission board was responsible for making sure that all possible investors received the information they needed and for keeping firms off the stock market that "might harm potential investors". In case the board rejected the admission of a firm, they did not need to justify their decision.[22] Thus we do not know their criteria for excluding firms from the stock market.

Furthermore, newly incorporated firms as well as transformed firms could not be listed at a stock market during the first year after incorporation. They had to publish the balance sheet and a profit and loss statement of their first year as a joint stock company first. In exceptional cases, this retention period of one year could be dispensed by the provincial government of the state where the stock market was located.[23]

Between 1897 and 1913, a large number of banks were actively involved in underwriters' services. Most of them only appeared once or twice, others organised IPOs for only one firm. Here, we often find prestigious private banks such as for instance Arnold, Abel, Bleichröder, Cahn, Dreyfuss and Rothschild. Still, the stock market was dominated by a small number of banks. Figure 1 shows a curve that visualises market concentration on the market of IPOs over the whole period calculated by the quantity of IPOs and the share in value for Berlin and all stock markets,

[21] See §§ 195, 199, 200, Handelsgesetzbuch des Deutschen Reichs 1897.
[22] §§ 36, 38, 41, Deutsches Börsengesetz 1896.
[23] §§ 39, Deutsches Börsengesetz 1896, see also Moral, *Aktienkapital*, pp. 1.

separately. In terms of quantity, 10 percent of the banks held about 50 percent of the market share of completed numbers of IPOs. Concentration was even stronger if we consider the market shares in size. Here, 10 percent of banks held about 70 percent of the stock market.

(Figure 1 about here)

Table 1 provides the market shares in numbers of completed IPOs in the period between 1898 and 1913 and in four sub-periods.[24]

Deutsche Bank, Dresdner Bank, Diskontogesellschaft, Darmstädter Bank, Berliner Handelsgesellschaft and A. Schaaffhausenscher Bankverein were not just the six largest banks according to their capitalisation; they were also the ones with the highest market share in the size of IPOs - a small oligopoly at the top of the market. Their overall market share in the number of IPOs reached 30 and even 40 percent if we measure the market share on the total size of IPOs. If we also include their groups - i.e. the banks with which they were closely linked through contracts or investment -, the overall market share in the number of IPOs reaches 37 percent and even 59 percent of the size. The market leader was Deutsche Bank. This bank had an overall market share in the number of completed IPOs of 9 percent. This rather low share is deceiving. Its market share of the size of IPOs was 18.8 percent over the whole period. Furthermore it strongly increased its market share by volume over the observed period: starting with 12.7 percent in the period from 1898 to 1901, the bank nearly tripled its market share to 29.6 percent from 1910 to 1913.

[24] In order to be able to split the sample in four equally sized four-year periods, I exclude the year 1897 in this table and in all following tables were the sample is split into sub-periods.

The most important and largest stock exchange in Berlin was clearly dominated by the oligopoly of the *Big Six*. The regional stock exchanges, however also show regional banks at the top of the market: The stock exchange in Frankfurt for instance was dominated by an oligopoly of Pfälzische Bank, Deutsche Vereinsbank, Darmstädter Bank and Deutsche Effekten- und Wechselbank. The Cologne stock exchange was dominated by the A. Schaaffhausen'scher Bankverein and Sal Oppenheim, a prestigious, private banking house based in Cologne. Thus in contrast to the US, where J.P. Morgan clearly dominated the market[25], a clear market leader was absent in Germany.

So far the modified Gerschenkron Hypothesis seems to be true and large banks shifted their influence on capital access from the market for loans to the stock market. They dominated the stock market and even increased their impact over time, altogether reaching up to 78.8 percent of the overall size in IPOs from 1906 to 1909.

However, the Herfindahl index, which is calculated as the sum of squared markets shares (treating all banks separately), only reaches a maximum size of 0.15 in 1906 to 1909. The measure ranks from 0 to 1. Although sizes of 1 hardly ever appear, 0.15 is still relatively low, considering that a size of about 0.3 is treated as an effective monopoly in banking for modern markets.[26] An average size of 0.08 indicates that the large banks were still competing with each other. However, there was a clear tendency towards further concentration: The Herfindahl index doubled in the period of 16 years.[27] Still, assuming the banks did not operate as a cartel and thus treating their market shares separately, competition was still perceptible.

[25] De Long 'Morgans's men'.
[26] Daskin and Wolken, 'Critical Herfindal index'.
[27] One can find a beginning concentration in earlier years, but it is much extended in this period. See Lehmann, 'Die Bedeutung der Emissionsbanken'.

(Table 1 about here)

Furthermore, the market shares were calculated by lead underwriter as indicated in the "Vierteljahreshefte zur Statistik des Deutschen Reiches", but this underestimates the influence of smaller or regional banks: Owners of firms, who wanted to go public, usually first consulted their "house bank" or another local bank. In most cases, as shown below, this bank did not act as the lead underwriter in the end. In fact this bank mostly not even signed the issue prospectus and did thus not appear in the official statistical record, the "Vierteljahreshefte zur Statistik des Deutschen Reiches", on whose data base the current paper relies. Rather the "house bank" approached one of the large banks that had a branch at the place of the envisaged stock market, which then acted as the lead and official underwriter.[28] The reason was that only banks, which appeared in the issue prospectus, were liable for the IPO. Sometimes this was only one bank and sometimes it was a number of banks who shared the risk and acted in most cases within a consortium. Duties and responsibilities, the distribution of risk and profits and other related facts within the consortium were fixed within a contract.[29] The available qualitative evidence taken from correspondences between firms, local banks and large banks and the literature of the time suggest there were recurring features regarding the role of large banks and their reputation in the issuing process:

First, local banks started negotiations with large reputable banks by distinctly stating their wish to get the shares placed well at the stock market. Both the "house bank" and the large bank often explicitly stated that the house bank needed the

[28] The only exceptions are cross listings. In 1906 for instance the private Bank Bernhard Loose in Berlin was the lead underwriter of Bremer-Vegesacker Fischereigesellschaft at the Berlin stock exchange and Mannheim stock exchange (Vierteljahreshefte zur Statistik des Deutschen Reichs 1906, I. pp. 268)
[29] See for instance Pohl, 'die Blütezeit der Konsortien', and Riesser, *Grossbanken* pp. 326

reputation of the large bank in order to place the shares. For instance, in the case of the IPO of "Friedrich Thörls Vereinigte Harburger Ölfabriken" ("F.T. United Harburg Oil Works"), Friedrich Thörl, the owner, went to his "house bank", the Harburg branch of Hannoversche Bank, in early 1906 to transform his firm into an incorporated stock company and after the restricted period of one year go public at the Berlin stock exchange. Hannoversche Bank then approached Deutsche Bank in order to sell the shares in Berlin.[30] Local banks often did not have the size, connections or branches at the stock exchanges and could thus not organise the IPO of their customers themselves. With good relationships to large underwriters in Berlin, however, they could still participate in the process of the IPO and thus make substantial profits with the IPO without facing the risk of high losses trough liabilities or being completely excluded from the process. Thus, in order to stay in the business local banks had an interest in establishing business connections with large prestigious banks. This necessity of large banks in the process of placing shares is further supported by the fact that Hannoversche Bank approached Deutsche Bank, although they were well aware of the risk to lose Friedrich Thörl as an important customer to Deutsche Bank. In a letter from the local branch to the head office of Hannoversche Bank, the branch manager mentioned that he was well aware of this possibility, showing his interest in preserving the current state of the customer relationship: "Our aim must be to ensure that nobody gets in here and that we maintain constant influence."[31]

Second, firm owners also seem to have been well aware that choosing the right lead underwriter was very important to place the shares. Although firms often did not directly approach the largest banks in the first place, the owner of a firm often directly

[30] Letter Hannoversche Bank branch Harburg to Deutsche Bank Berlin 13 April 1906 (HADB K16/123.
[31] Letter Hannoversche Bank branch Harburg to Hannoversche Bank head office 21 April 1906 (HADB K16/123): „Unser Streben muß daher darauf gerichtet sein, niemand anders hineinkommen zu lassen und ständigen Einfluss zu behalten."

addressed that he chose the particular local bank because of its well known business connections with the large banks. For example, the owner of "Farbwerke Rasquin" (Rasquin Colour Works), a firm that went public in 1912, approached Sal Oppenheim, a local private bank, in an official letter, asking if they would provide support for going public at the Berlin stock exchange by using their good relationship with the large bank in Berlin (meant was the Discontogesellschaft, which was the lead underwriter later) [32]

Large Banks, short run profits and short run signalling

The question now arises whether large banks exploited their position to extract extraordinary short run profits and whether investors got "fair deals".

One possibility to extract profits from the IPO business was charging high underwriting fees. We do not have a clear picture about how large the underwriting fee actually was, since the fee was negotiated individually and in most cases this information is missing. Thus we can only assume that it varied across underwriters and firms depending on individual negotiation power. For the cases where we have the information, the fees were independent of the actual size of the issued shares. This suggests that they were intended to cover the cost of the issuing process (prospect, stock market fee, taxes etc.). For the IPO of Farbwerke Rasquin for instance, the Diskontogesellschaft charged a fixed fee of 50,000 Marks for issuing shares of 1.5 Mill Marks (3,3 percent) and another variable 1/8 percent on the market size of the sold shares.[33] In the case of the IPO of Hubertus Braunkohlen, Deutsche Bank charged the same fixed fee of 50.000 Marks for issuing shares of only 250.000 Marks. There is a note that out of this amount, they paid

[32] Letter Rasquin to Sal Oppenheim 9 November 1910 Sal. Oppenheim jun. & Cie. File 'Farbwerke Rasquin'.
[33] Sal. Oppenheim jun. & Cie. File "Farbwerke Rasquin".

the cost for the introduction at the Berlin stock exchange and the inspection of the Deutsche Treuhand, an accounting firms[34] and shared the remaining amount with Sal Oppenheim – the local bank.[35] In the case of Amme, Giesecke & Konegen, Deutsche Bank charged a fixed amount of 25.000 for issuing shares of 4 Mill. Marks.[36]

We have only very few cases, which cannot provide sufficient evidence to conclude that large banks charged exploiting fees. From the very few cases, however, we cannot draw the conclusion that this was the case. The fees in these cases was relatively fix around 50.000 Marks and according to the notes intended to cover the actual costs of going public.

According to Moral, a contemporary observer, the primary interest of the large banks to underwrite an IPO lay in the desire to establish long term business relationships with industrial firms.[37] Long term business relationships had two positive effects: The banks would get to manage the banking business of these firms, and furthermore gain detailed information about these firms and their businesses, which might be valuable for future business with similar firms or interesting to other potential business partners. Long term business relationships were often already part of the contract regarding the IPO. In the case of the IPO of Farbwerke Rasquin, Sal Oppenheim mentioned in a letter to the owner if the firm had a bank account in Berlin, this would have to be transferred to the Diskontogesellschaft, the lead underwriter.[38]

Nevertheless, large banks certainly made substantial profits as underwriters, selling shares which they bought from the original owners of the firms on the stock exchange,

[34] See also p.24.
[35] Letter Sal Oppenheim to Deutsche Bank 18. March 1910 and Letter Deutsche Bank to Sal Oppenheim 19. March 1910. Sal. Openheim jun. & Cie. File „Hubertus Braunkohlen“.
[36] Denkschrift Hannoversche Bank vom 24. March 1914 (HADB K16/68)
[37] Moral, *Aktienkapital*, p. 45.
[38] Letter Sal Oppenheim to Rasquin, 5. December 1911, Sal. Oppenheim jun. & Cie. File "Farbwerke Rasquin".

depending on the individual contract. As described above, banks took responsibility for the successful placement of a firms' IPO. This process did not always work in the same way. We can distinguish four forms of contracts, which mainly differ in the way risks and profits were shared between issuer and underwriters:[39]

First, banks sold the share on behalf of the firms ("Begebungskonsortium"). Here banks did not invest their own capital, and the issuer kept the whole risk. Second, the underwriter bought all shares from the owner at a certain price – which was mostly above par size.[40] In this "Übernahmekonsortium" the banks carried the whole risk, but also gained the spread between the price paid to the issuer and the offering price. A third form of contract was the "Garantiekonsortium"; this was a mixture between the first two cases. Here the underwriters sold the shares on behalf of the issuer, but guaranteed to buy unsold shares at a fixed price after a short period. Another mixed form was the "Optionskonsortium". In this case, the underwriter consortium bought a certain amount of shares and further obtained the option of buying the remaining shares later.

The decision which of these contract types was chosen depended on individual negotiations between underwriter and firm owners. It can thus only be reconstructed on the basis of the original contract, which has only occasionally been preserved. Thus we cannot calculate exactly how high the short run profits of the large banks were. However, they were dependent on the offering price and the first trading price, since the bank would not offer the shares at a price below they had paid to the issuer.

Fixing the offering price was a strategic decision. If the offering price was relatively high, the bank could gain – depending on its contract with the firm owner and the other

[39] Burhop, Die Kreditbanken, p. 199.
[40] Typically, shares were quoted in percent of par size. The usual par size of a share was 1,000 Mark.

underwriters - through arbitrage between the difference of the offering price and the price they paid to the firm owner.[41]

If, on the other hand, the price was too high, they might not sell all shares – implying a substantial liquidity risk for the underwriter. Furthermore they would jeopardize the trust of their consumers if the offering price was too high and could not be justified by the firm's performance in the following months and years. This negative effect for the reputation of a firm would harm future issues.[42] Thus they might have had an interest in providing "fair deals" to investors – similar to J.P. Morgan in the US.

According to Riesser, the offering price was generally between the price paid to the issuer plus interests, stamp tax, provision and an appropriate profit margin, and the prices of similar firms which were already listed on the stock market and were expected to perform similarly. [43] He does not, however, discuss or describe what was expected to be an 'appropriate' profit.

I will illustrate the way how the offering price was determined in a process of negotiations using the IPO of Thörl that I discussed above. The IPO took place in 1908 at the Berlin stock exchange. Lead underwriter was Deutsche Bank - and the "house bank" was Hannoversche Bank, the very same banks had already in 1906 organised the incorporation of the firm into a joint stock company. Both owned shares of the firm. Deutsche Banks suggested a price of 155 in the first place, expecting an "appropriate" first day return for their customers, which would have been about twelve percent, since the first price on the market later turned out to be 174. [44] With a higher price, they

[41] Moral, *Aktienkapital*, p. 48
[42] Ibid., p. 49 and Schmalenbach, 'Emissionstechnik', p. 80.
[43] Riesser, *Die deutschen Großbanken*, p. 291.
[44] Letter 30. July 1908 Deutsche Bank to Hannoversche Bank: „Bei 14% Dividende würde sich ja auch noch bei etwa 160/165 eine angemessene Verzinsung ergeben, aber unsere Kundschaft soll verdienen und darum scheint mir ein Kurs zwischen 150 und 155 angemessen. Wir brauchen ja vielleicht nicht unseren ganzen Bestand aufzulegen, sondern können dann, wenn der Kurs, was hoffentlich kommt, steigt,

feared a loss of reputation and thus possible investors in the future, especially considering that industrial papers became more attractive at the time.[45] However, since they also owned shares, their own profit would also increase by selling at a lower price and thus generating high initial returns. Hannoversche Bank claimed this price was too low, suggesting that Friedrich Thörl, the former owner of the firm and the main share holder, would not agree to it since he had just bought shares from the consortium at a price of 167.5 and stating that Berliner Handelsgesellschaft would probably issue the IPO at a price of 210.[46] Deutsche Bank could not enforce its price and the offering price was finally fixed at 170.[47] The way how Hannoversche Bank - the "house bank" of the owner of the firm - threw in the Berliner Handelsgesellschaft and its possibly much higher offering price supports the hypothesis that the competition between the large banks and their groups kept the initial returns low.

To summarize: The offering price in the case of Thörl was fixed in a negotiation process which was influenced by the concern of Deutsche Bank to loose its reputation, the influence of Friedrich Thörl, the main share holder, the profit interests of Hannoversche Bank, which, since it did not sign the issuing prospectus, did not face a loss of reputation and finally the market competition by the Berliner Handelsgesellschaft.

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successive weiter verkaufen." (HADB 1733). The first market price (174) was taken from Berliner Börsenzeitung 1. November 1908.

[45] Letter Deutsche Bank Berlin to Deutsche Bank Hamburg 1. October 1908: "…, denn der Einführungs- bzw. Subskriptionskurs ist derjenige, auf welchen die einführenden Banken für alle Zeiten hin festgelegt und verantwortlich gemacht werden. Dazu kommt, dass wir gerade jetzt in einer Periode zu stehen scheinen, in welcher das Publikum sich wieder lebhafter für Industriepapiere zu interessieren scheint; und es wäre auf der einen Seite ein gar nicht gut zu machender Fehler, wenn die Zeichner der Aktien bei einem hohen Emissionskurs und etwaigen Weichen des Kurses vor den Kopf gestoßen werden, und andererseits ein Stimulus für das Publikum, sich auch bei späteren Emissionen zu beteiligen, wenn der Zeichnungskurs nach der Subskription in die Höhe geht." (HADB S 1733).

[46] Letter Hannoversche Bank to Deutsche Bank 30. July 1908 „ein Kurs unter 170 wäre eine Diskreditierung der Sache und würde Thörl zum Todfeind machen. Thörl selbst hat im Konsortium kürzlich Aktien zu 167,5% gekauft. Die Handelsgesellschaft würde das Papier zu 210 herausbringen." (HADB S 1733).

[47] Letter Hannoversche Bank to Deutsche Bank 6. October 1908. (HADB S 1733).

The phenomenon that the offering price is rather low and that we can observe a positive difference between the offering price and the first trading price, i.e. positive initial return, is called "underpricing". As shown above we cannot draw conclusion about a banks short run profit based on underpricing, since they might have bought the share from the owner at a lower price and would thus leave "money on the table". On the other hand a low or a negative initial return must not necessarily mean that the banks gained high short run profits, since they might own a large amount of the shares themselves and would thus benefit from high initial returns.

However, if underpricing was low and furthermore not significantly different for the large banks at the top of the market in contrast to other banks, the hypothesis of an oligopoly that faced price competition which reduced the possibilities to extract short run profits is supported.

To calculate and compare the Initial returns for the IPOs and whether they differ significantly for the large banks, I reduce the sample to the IPOs issued at the Berlin stock exchange, for which one can find the first trading price in *Berliner Börsenzeitung*. This reduces the sample to 202 IPOs. All other IPOs were either introduced at a provincial stock market or were introductions[48], where the initial returns would be zero.

Weigt[49] shows that for shares that were listed on more than one German stock market, the price differences were very small. Thus arbitrage possibilities were very limited and the capital market within Germany can be considered as relatively well integrated. Thus the Berlin stock exchange can be treated as representative for all stock exchanges within Germany.

[48] In this period another way of going public can also be observed. Instead of offering the shares before the first day of trading, it was also possible introduce the shares to the market ("freihändig"), which means they were traded from the first day without a period where banks and private customers could apply for shares. See Moral, *Aktienkapital*, p. 49-50.
[49] Weigt, *Der Deutsche Kapitalmarkt*', pp. 191.

Underpricing it is then calculated as follows:

$IR = \left(\frac{p_{first} - p_{offering}}{p_{offering}} \right)$, where p_{first} is the price at the first trading day[50], $p_{offering}$ the offering price.[51]

Furthermore, since for the period analysed here a high frequency stock market index for the Berlin stock exchange is available, we are able to compute market adjusted initial returns, which are calculated as follows:

$IRm = IR - \left(\frac{A_{first} - A_{offering}}{A_{offering}} \right)$, where A_{first} is a stock market index at the day before the first trading day, and $A_{offering}$ the same index on the first trading day of the IPO. The index consists of 27 randomly chosen firms that were consistently listed and traded on the stock market in Berlin and weighted with their value.[52] It is not an index of IPO firms, and thus might cause a slight bias. However, it still corrects for general market cycles.

Underpricing was first documented and analysed on modern markets,[53] but it has also been observed on historical stock markets, where it seems, however, to have been much less pronounced. In modern markets underpricing averages about 15 percent in the USA,[54] Germany[55] and France.[56] By contrast, for the Berlin Stock exchange Burhop

[50] The number of days between the issue and the first day of trading is in most cases below a period of 14 days. Sometimes, however, it lags a couple of month. Qualitative evidence from correspondence between banks provides evidence that the date reported in the Vierteljahreshefte zur Statistik des Deutschen Reichs is often much earlier than the actual date when the lead underwriter started to offer the shares. I therefore keep all IPOs in the sample, although sometimes the number of days between the issue and the first day of trading exceeds 14 days. Running the regressions with different sub-samples, however, does not change the results. Regressions are available on request.
[51] See Burhop, 'Underpricing'; Weigt, *Der Deutsche Kapitalmarkt*; Chambers and Dimson, 'IPO Underpricing'.
[52] Taken from Gelman and Burhop, 'Taxation'.
[53] See Stoll and Curley, 'Small business'; Logue, 'On the pricing'; Reilly, 'New issue investors'; Ibbotson, 'Price performance'.
[54] Ritter and Welch, 'A review'.
[55] Ljungqvist, 'Pricing'.

documented an underpricing of 5 percent for the period from 1870 to 1896[57] as does Weigt[58] for the period between the 1880s and World War I. Chambers and Dimson[59] found no underpricing in the first half of the 20th Century and a 10 percent jump in underpricing after World War II on the London stock exchange.

Table 2 shows the average initial returns of all IPOs as well as for the oligopoly of large banks treated as one group.

(Table 2 about here)

Overall underpricing was relatively low with only about three to four percent. The median underpricing was even lower with only about one to two percent. Short run profits deriving from underpricing seem to have been low; investors did not earn quick money by getting particular "fair deals". Thus they got no reward for the high risk of IPOs, which further supports the hypothesis of perceptible price competition on the stock market which kept the overall risk low.

Furthermore, large banks seem to have had no signalling effect for short run profits in contrast to the suggestions of the qualitative evidence. On the first view it looks as if the average underpricing for the larger banks over the whole period was indeed significantly higher. However, by splitting the initial returns into the average initial return in four sub-periods it becomes apparent that this difference is driven by the period between 1898-1901, where the difference is driven by outliers, since the median

[56] Biais, 'IPO mechanism'.
[57] Burhop, 'Underpricing'.
[58] Weigt, *Der deutsche Kapitalmarkt*. The data set includes all IPOs issued in Berlin that were still traded in 1914. My data set includes all IPOs.
[59] Chambers and Dimson, 'IPO Underpricing'.

in this period did not significantly differ between large banks and others.[60] However, since underpricing is influenced by many other factors I run a simple OLS regression in order to extract whether underpricing was significantly different for the large banks.

There are a number of recent theoretical approaches trying to explain underpricing for modern markets.[61] Some of them suggest that reputation of the lead underwriter influences underpricing systematically. The classical paper by Rock suggests that asymmetric information about the quality of an IPO among different groups of investors can induce underpricing.[62] If the demand from the group of informed investors is insufficient to buy the whole issue, uninformed investors will have to be attracted. Informed investors buy high-quality issues only, whereas uninformed investors buy a mix of high- and low-quality issues. Realizing this, banks have to compensate uninformed investors by offering them all issues at a lower price. This implies that banks with a better reputation may not need to offer systematically below the actual size and thus that IPOs issued by those banks should have lower initial returns than others.[63] Empirical research does not provide a clear answer as to whether one should expect lower or higher underpricing for IPOs that were issued by banks with a high reputation. Beatty and Welch find that the relationship depends on the time period. Before the 1990s, they find that the relationship between underwriter prestige and underpricing was negatively correlated, whereas it was positively correlated in the 1990s.[64] Chambers and Dimson (for Britain) and Burhop (for Germany) test the impact of reputation on

[60] However, pricing strategies seem to have varied between the banks. A. Schaaffhausen'scher Bankverein had quite a large average underpricing with nearly six percent whereas Dresdner Bank had a rather low underpricing of only about one percent. This further contradict the hypothesis that the banks were acting like a bank cartel.
[61] See Ritter and Welch, 'A Review' for an overview of the literature.
[62] Rock, 'Why new issues'.
[63] Carter and Manaster, 'Underwriter Reputation'.
[64] Beatty and Welch, 'Issuer expenses'.

underpricing in their sample of historical markets, but find no clear evidence that banks with higher reputation had lower or higher underpricing.[65]

Surely there are further empirical and theoretical investigations about other factors besides reputation that influence underpricing. However, most of these theories require date that are unavailable in an historical setting.[66] Given the limitations of historical data, to control for other influences I add the same control variables as Burhop[67], the most comprehensive study of the underpricing phenomenon using historical data for Germany.

In order to catch information asymmetries which according to Rock can induce underpricing, I include firm specific variables such as size of an issue (total value of all shares), the age of a newly listed corporation[68] and the profit in relation to the book value (current accounts) in the year before the IPO.[69] This data were taken from Salinger Börsenhandbuch, a stock market manual and Handbuch der deutschen Aktiengesellschaften (Handbook of German joint-stock companies). The economic intuition here is that large and old firms provide more information than small and young firms. Therefore, more information is available for all investors, the problem of asymmetric information among different groups of investors becomes less important and underpricing declines. Generally Rocks hypothesis is supported for modern U.S. data[70]. For Germany the evidence is not that clear. Ljungqvist[71] reports a positive and

[65] Chambers and Dimson. 'IPO Underpricing' and Burhop, 'Underpricing'.
[66] The optimal IPO mechanism proposed by Biais et al. 'Optimal' requires information about the supply and demand for a certain issue; the model proposed by Green 'Presidental' requires knowledge about the distribution of the issue between institutional and retail investors. See Burhop 'Underpricing', p.6.
[67] Burhop 'Underpricing'.
[68] Firm age is the number of days from the foundation or newly incorporation of a firm as a joint stock company and the day of the IPO. Because of the retention period of one year the lowest possible age should be 365. There are, however, still some firms with a lower number of days before they went public, which obviously had a special permission. See §§ 39, *Deutsches Börsengesetz 1896.*
[69] Rock, 'Why new issues'.
[70] Kennedy et al. 'Test of asymetric' and Michael and Shaw 'Pricing'
[71] Ljungvist 'Pricing'

significant correlation between the size of an IPO and initial returns, whereas Wasserfallen and Wittleder[72] do not find a correlation. In a historical setting, neither Burhop[73] nor Weigt[74] can find a significant relationship between size of an IPO and age of a firm and underpricing.

Another theoretical explanation for underpricing is based on asymmetric information between issuer and investor. If the issuer knows more about the issue than the investor, a classical lemon problem emerges and the issuer should underprice the IPO to signal its quality. If the issuers use costly underpricing as a signal, they are more likely to subsidize this by having a larger SEO later.[75] This has been rejected for modern as well as for historical data.[76] Our measure to test this theory is a dummy that is equal to 1 if there was an SEO within 5 years at all and the size of the SEO placed during five years after the IPO divided by the size of the IPO. To support this hypothesis, the coefficients are supposed to be positive and significant.

Another hypothesis for which I control is the market sentiment hypothesis. As Burhop points out, contemporaries hypothesised that the general economic and political climate, as well as the liquidity of the financial market, influenced the success of IPOs.[77] Empirical studies using modern U.S. and German data also support a positive correlation between past performance of the stock market and initial returns.[78] This can also be observed in historical settings: Weigt reports positive correlation between the performance of the stock market index during the year preceding the IPO and initial

[72] Wasserfallen and Wittleden 'Evidence'
[73] Burhop, 'Underpricing', for the period 1870 to 1896.
[74] Weigt, *Der deutsche Kapitalmarkt*. The data set includes all IPOs issued in Berlin in the period 1882 to 1913 that were still traded in 1914. My data set includes all IPOs.
[75] Grinblatt and Hwang, 'Signalling'; Allen and Faulhaber, 'Signalling by underpricing'; Welch, 'Seasoned Offerings'.
[76] Kennedy et al., 'The implications'; Michaely and Shaw, 'The pricing'; for the 1870 to 1896: Burhop, 'Underpricing'.
[77] Burhop, 'Underpricing'.p. 8 and Lotz *Die Technik*, p.44 and Moral *Aktienkapital*.
[78] Loughran and Ritter 'Why has' Lowry and Schwert'IPO pricing mechanism' and Ljungqvist 'Pricing'.

returns for her sample of long-living firms and so does Burhop for the period 1870 to 1896 I also control for past market returns by adding the average market return of the previous year.

In summary I estimate the following OLS- regression:[79]

$$IRm_i = c + \beta_1 bank + \beta_2 x_i + \beta_3 Pastmarketreturn + \varepsilon ,$$

where the dependent variable IRm is calculated as shown above. The variable "Bank accounts" for the dummy variables for the *Big Six* as lead underwriter and *Big Six* as member of the consortium of underwriters banks, vector x_i of firm specific explanatory variables accounts for observable characteristics attached to the IPO, in particular the size of the IPO, the days since incorporation (age), size of SEO relative to the size of the IPO, dummy whether there was an SEO within 5 years, profits in percent of current accounts of the year before the IPO.

Table 3 provides the regression results. Regressions 1 and 3 are based on a sample of all IPOs issued in Berlin. Regressions 2 and 4 are based on the IPOs of sample 1, where I could find additional firm information.[80] Overall, all models are significant. The r-squared is rather low in all regression- explaining only up to eleven percent of the variability of the market adjusted initial returns, but this is similar in comparable studies.[81] None of the explanatory variables, however, is significant. This, again, is very similar in comparable studies.[82]

[79] It is theoretically possibly to estimate a two-stage model that accounts for the possible endogeneity oft he bank variable. Since the IR variable is multivariate and assumed to have an extreme-size distribution and the potentially endogenous variable is binominal, the error distributions are incompatible. This complicates the implementation of instrumental variables. Even if an instrumentabl –variables procedure can be implemented, however, the difficulty of correctly specifying the structural equations often renders two-stage-models estimates untrustworthy in practice. Fohlin, *Financial Capitalism*, p.255.

[80] Firm specific information was not available for all firms in the sample. I also ran the regression for the reduced sample without the firm specific variables and the results remained unchanged. The results are available upon request.

[81] See for instance Burhop, 'Underpricing'.

[82] Ibid.

In general the regressions confirm the descriptive statistics. The initial returns of the six largest banks are not significantly higher or lower. Large banks did not offer particular "fair deals" or by selling a relatively high prices raised their own profits.

As seen above, the offering price was determined as a negotiation process between firm owner and involved banks. The fact that underpricing was low and not different for the banks with the highest market shares provides evidence that the possibilities to offer particular "fair deals" to investors or to extract high underwriter premiums were strongly restricted by the competition between the largest banks. Furthermore, as in the case of "Thörl", regional "house" banks may have negotiated on behalf of the owners of the firms trying to get sound deals for their long time customers. Another explanation might be that all IPOs at the time had a very good quality due to the high regulation of the IPO market or that the potential investors at the time were all very well informed.

(Table 3 about here)

The signalling function in the longer run

As shown above, large banks dominated the market but investors did not get higher benefits trough higher underpricing. Did the fact that one of the *Big Six* underwrote an issue signal to investors that the firm would perform well in the future? Carter, Dark and Singh, for instance report for modern markets that the excess performance of IPOs underwritten by higher quality investment banks is better in the long run, not necessarily on the first day.[83]

[83] Carter, Dark and Singh, 'long- run performance'.

There is strong evidence that large banks were perfectly aware of the fact that they associated their name with the IPO and that its performance had an impact on their future reputation: As Deutsche Bank stated on one occasion in 1906, „[i]f we introduce this issue, our name represents the incorporation and we must vouch for the shares until they stop being traded.[84] According to Moral, a contemporary expert, the bare fact that a large bank managed the IPO of a firm raised trust in the firm.[85] He further cites another contemporary observer, Waldemar Müller who argued that a bank, which issued a share, would be made morally responsible for the future fate of this firm.[86]

Banks had two ways to ensure that the IPO performed well: First by carefully choosing well performing and promising firms in the first place and second by monitoring and supervising corporate managements.[87] Qualitative evidence indicates that large banks were evidently not prepared to issue the IPO of each and every firm. They were careful in making a right judgment about whether to take responsibility of the IPO of a certain firm. Although launching SEOs, granting loans and organising mergers would allow them to benefit from relationships with less profitable firms, too. They seem to generally made sure the firm was sufficiently profitable, which supports De Longs Argument also for the German case that banks had to make sure they did not lead its clients into unsound deals in order to keep the reputation which they needed to maintain market power[88]: They employed relatively independent audit companies to inspect firms

[84] Letter Deutsche Bank to Hannoversche Bank 30 April 1906: „Führen wir dieses Papier ein, so decken wir mit unserem Namen die Gründung und haben vor der Welt die Aktien zu vertreten und für sie einzustehen, solange sie überhaupt eine Notiz haben." (HADB K16/123).
[85] Moral, *Aktienkapital*, p. 13
[86] Müller, 'Die Organisation', p. 119.
[87] However, we do not have the information whether the large banks were for instance members of the control board of the firms that they underwrote. This extensive data work must be left to future research. However, monitoring and supervising corporate managements were an accepted part of German financial history. See for instance De Long 'Morgans's men', p. 228. Thus it is very likely that this was also the case for the firms where the large banks were lead underwriter or part of the underwriter consortium.
[88] De Long 'Morgans's men', pp. 232,233.

before an IPO and sometimes did their own research, demanding detailed reports on balance sheets and information on profits.

The most established and known instrument for banks to gain information about the firms was the Deutsche Treuhandgesellschaft, which was founded by Deutsche Bank in 1890 and became the first official auditing company in 1901. This company established a complete new service within the German economy with providing independent experts testimony about the performance and liquidity of firms, which was very successful. With the success of the Deutsche Treuhandgesellschaft it became worthwhile for many banks to own or co-own in an auditing company. In 1910 many important banks such as Darmstädter Bank and Berliner Handelsgesellschaft were shareholders of Deutsche Treuhandgesellschaft and had a representative in the supervisory board. The Discontogesellschaft founded its own Revisions- und Treuhandgesellschaft in 1905. [89]

Their own research on the credibility and performance of the firms was often clearly organised. The Berliner Handelsgesellschaft, for instance, had detailed guidelines about how to check the credibility and performance of industrial firms (see Table 4). The guidelines were broken down into five dimensions. First, the geographical circumstances had to be evaluated. Then, special circumstances of the firm were assessed. This point covered production methods, patents, technology compared to that used by the main competitors of the firm, dependence on skills of workers, machines or special apparatus. The third area of inspection focused on the administration and management of the firm, its structure, design and efficiency. The fourth covered money and profits in detail, evaluating cost, capital and investment and the last covered other

[89] Dahlem, 'Die Professionalisierung', pp. 95-102, 159, 190.

factors that influenced performance such as history of the firm and dependency on the owner.[90]

(Table 4 about here)

Deutsche Bank was similarly careful in choosing firms. In the case of Thörl, Deutsche Bank made sure that the firm had performed sufficiently well in the previous years. Apart from the commercial inspection by their - for this purpose founded - Deutsche Treuhandgesellschaft they further insisted on a technical inspection by an independent expert.[91] The branch of the Hannoversche Bank also provided a detailed report about the development of the firm, of its profits since 1886 and its latest balance sheet and development possibilities similar to the guidelines of Berliner Handelsgesellschaft above. They even characterized the personality of the owner (highly intelligent, trustworthy and hardworking).[92]

In another case, where Hannoversche Bank again was the local bank and Deutsche Bank the lead underwriter, launching the IPO of "Harburger Eisen- und Broncewerke AG" ("Harburg Iron and Bronze Works") in October 1912 at the Berlin stock exchange, Hannoversche Bank also provided detailed reports on the liquidity and performance of the firm with a special mention of their long term business relationship with this firm,

[90] Memo Dr. Rathenau 27 July 1906 "Grundsätze für die Prüfung industrieller Unternehmungen". R 8127 / 14069.

[91] Letter Deutsche Bank to Hannoversche Bank: „Die Deutsche Treuhand-Gesellschaft veranschlagt für die Prüfung 1.000 Mark. Neben dieser kaufmännischen Prüfung soll auch eine technische Prüfung erfolgen." Harburg 30-April 1906. (HADB K16/123). Hannoversche Bank replied to Deutsche Bank: „Mit der Illationsgründung und Prüfung durch technische Sachverständige ist man einverstanden." 1 May 1906. (HADB K16/123).

[92] Letter Hannoversche Bank to Deutsche Bank 1. May 1906: „Herr Thörl ist ein hoch intelligenter und rühriger Fabrikant und Geschäftsmann, der das, was er geschaffen hat, seiner eigenen Kraft, seinem Unternehmungsgeist und seiner Tüchtigkeit verdankt. Ursprünglich widmete er sich dem Studium der Chemie, gelangte aber schon bald zu eigener Selbständigkeit, wobei er sich nicht allein als gewiegter Geschäftsmann, sondern auch als kluger und fähiger Fabrikant erwies." (HADB K16/123).

which would make a successful IPO likely.[93] "Hubertus Braunkohlen AG zu Brüggen" ("Hubertus Lignite Inc., Brüggen), was inspected by a mining expert, who was an employee of Deutsche Bank, before they agreed to underwrite the IPO.[94]

The Diskontogesellschaft generally only issued IPOs of large firms. In a letter to Sal Oppenheim, which was the local bank in this case, about a possible issue of "Farbwerke Raquin" (see above), they stated that they would not usually issue IPOs of firms with an equity capital of only 1.5 Million Marks, but that they would (and eventually did) if the firm had potential for growth, of which they demanded conclusive evidence in form of the last closing account, the report of the chamber of trade written on the occasion of the foundation of the company, inspection by the Treuhand and more information about the market for the type of oil colours which Rasquin produced.[95]

Apart from these criteria for adequate business performance of firms, some banks preferred firms from specific sectors. The reason might have been that they gained sector specific insights which made it easier to judge about the performance of a firm from this sector. As table 5 shows, most IPOs at the time - and therefore largely represented in the portfolio of every bank – were issued by industrial firms (metals working and machines producers). However, most of the large industrial firms were issued by the large banks. Regional stock exchanges show a greater variability of sectors and a lower concentration on the large industrial firms. Here a large number of

[93] Letter Hannoversche Bank to Deutsche Bank 6. December 1910: „Die langjährige Kenntnis der Firmen und die ausführliche Prüfung des Geschäfts lassen einen erfolgreichen Börsengang erwarten." (HADB K16/112).

[94] It was not stated directly what the expert („Bergassessor Pohl"), was supposed to do. But the context makes clear that this way Deutsche Bank tried to ensure they would underwrite a firm which would performs well in the following years. Letter Deutsche Bank to Sal Oppenheim 19.3.1910; Letter Sal Oppenheim to Deutsche Bank 21. March 1910, Sal. Oppenheim jun. & Cie. File "Hubertus Braunkohlen AG in Brüggen".

[95] Letter Discontogesellschaft to Sal Oppenheim 9. August 1911 Sal. Oppenheim jun. & Cie.File 'Farbwerke Rasquin'

smaller businesses covered in sector “other”, which includes for instance sectors such as construction, food and beverages and trade can be observed.

(Table 5 about here)

Banks also concentrated on regions as illustrated in figure 2. The figure shows the headquarters of the firms that went public in the period from 1896 from 1913 by lead underwriter for the six largest banks. Deutsche Bank as well as for instance Berliner Handelsgesellschaft issued shares of firms that were spread over the entire country, with main centres in the most industrialized regions, such as the Rhineland, Saxony, Hamburg and Berlin. However, Dresdner Bank preferred Saxony, in particular the vicinity of Dresden, where it was founded. Darmstädter Bank had its centres of attention around Frankfurt and Darmstadt, where it was founded, and in Cologne. Diskontogesellschaft was most active in the western provinces of Prussia, in the area around Cologne and the Ruhr, and in East Germany, but not at all in the south of Germany. A. Schaaffhausen’scher Bankverein, who kept it’s headquarter in Cologne, also had its strongholds in Cologne and the Ruhr area. [96]

(figure 2 about here)

In summary it seems as if the large banks were careful in choosing the most promising firms. Thus, despite the absence of a signal on the first day (underpricing) we would expect one can observe a signalling effect of the large banks in the first year after the IPO.

[96] See Footnote 14.

At a first glance, figure 3 shows that this was obviously not the case. The figure compares the market to book values one year after the IPO and the profit per book value in the year of the IPO for 373 IPOs, where the information was available. We would expect to see that firms whose IPOs were issued by one of the *Big Six* would have higher profits per book value or higher market to book values, but there is no significant difference between them.[97]

(figure 3 about here)

However, maybe the performance within the first year was still better or less volatile. Long run returns for each of the twelve months after the IPO are calculated with the following equation[98]:

$RR_{it} = \frac{p_{i(t+1)} - p_{it}}{p_{it}}$, where p_t is the closing price of month t for issue i.

Figure 4 provides the cumulated raw returns for the whole sample by sector for the *Big Six* and the other banks. The returns for the *Big Six* are for most sectors slightly above the returns of the IPOs issued by other banks. A significant difference can only be observed for Railways and Textiles. However these IPOs made only about eight percent of the overall value of all IPOs issued by the *Big Six* (see table 5). The IPOs of the sector which mattered most – Machines and Metal working performed – similarly.

[97] This does not change if we break the figure into the four sub-periods, include Dividents and 'Stueckzinsen'- a typical feature of the German stock market (Figures are available on request).

[98] Carter et al. , 'Underwriter reputation'. have documented the relation between long-run performance of IPOs and underwriters on modern markets and have shown that the underperformance of IPO stocks relative to the market over a three-year holding period is less severe for IPOs handled by more prestigious underwriters. For the USA between 1975 and 1984, Ritter, 'The long-run performance' reports on average 29 percent underperformance compared to other issues for the first three years. However, other scholars such as Gomber and Lerner,'The Really Long-Run Performance'., who examines US IPOs over a much longer time period US (1934 to 1972) find no underperformance. However, since we are only interested in the difference of the performance between the *Big Six* and others, I focus on the IPO performance by bank and not compared to the entire market.

Most returns fell slightly after about four month. This indicates possible price support in the first months. This was, however, not only legal, it was expected as a responsibility of the underwriter to take "care and attention" of price losses caused by short run speculation on the initial returns. It was not supposed to artificially increase the price. [99]

(figure 4 about here)

Another measure of long run performance is the Sharpe ratio or reward-to-variability ratio.[100] This is calculated by dividing the return for the first year by the variability of the monthly returns. The higher the Sharpe ratio, the higher is the return per risk and the better is the investment. Table 6 shows the results of a simple OLS regression with the Sharpe ratio as dependent variable. I control for firm specific variables, past market returns, different sectors and time. In summary I estimate the following OLS-regression:[101]

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[99] Riesser, *Die deutschen Großbanken*, p. 294. By studying the correspondence between underwriter consortia, one can find much qualitative evidence of this kind of price support in the first time after the IPO. The Hubertus Braunkohlen AG in Brüggen for instance, was introduced at the Berlin stock exchange in July 1910 at the offering price of 150 percent of its par size by Deutsche Bank and Sal Oppenheim. In a letter from July 1910, Sal Oppenheim informed Deutsche Bank that they traded shares with a total size of 51.000 Mark in the first month of the IPO in order to keep the price stable. Letter Sal Oppenheim Deutsche Bank 7. July 1910: „Am 7.7. wurden zudem 51.000 ge- und verkauft (Kurspflege)." Sal. Oppenheim jun. & Cie. File "Hubertus Braunkohlen AG in Brüggen". In a letter from Hannoversche Bank in Harburg to Hannoversche Bank in Hannover about the shares of Harburger Eisen- und Broncewerke, the branch informed its head quarters that the former CEO moved to Berlin, shortly after the IPO and his retirement. He further admitted to have sold shares of 40.000 Mark to Dresdner Bank – a direct competitor, without informing the underwriter consortium. The branch warned its headquarter against possible price losses. Letter Hannoversche Bank Harburg to Hannoversche Bank Hannover 15.8.1913 (HADB K16/112). In the case of Farbwerke Rasquin, however, there is a hint that the motive for price support was not only to make up for the effects of short run speculation. This issue was introduced by Diskontogesellschaft and Sal Oppenheim in Berlin in February 1912. In mid-February the Diskontogesellschaft suggested to raise the price in the coming days in order to increase investor's interest in the issue. However, again stabilization only lasted for a short period. Up to the end of February, they stabilized the price every day and thereafter only some days in March. Letter Diskontogesellschaft to Sal Oppenheim 14.12.1913 Sal. Oppenheim jun. & Cie. File "Farbwerke Rasquin".

[100] Sharpe, 'Mutual Fund Performance'

[101] As for the previous regressions (underpricing), tt is theoretically possibly to estimate a two-stage model that accounts for the possible endogeneity oft he bank variable. Since the Sharpe ratio is multivariate and assumed to have an extreme-size distribution and the potentially endogenous variable is binominal, the error distributions are incompatible. This complicates the implementation of instrumental variables. Even if an instrumentable –variables procedure can be implemented, however, the difficulty of correctly specifying the structural equations often renders two-stage-models estimates untrustworthy in

$$Sharpe_i = c + \beta_1 bank + \beta_2 x_i + \beta_3 Pastmarketreturn + \varepsilon ,$$

where the dependent variable Sharpe is the Sharpe ratio calculated as discussed above. The variable "Bank" for the dummy variables for the *Big Six* as lead underwriter and *Big Six* as member of the consortium of underwriters banks, vector x_i of firm specific explanatory variables accounts for observable characteristics attached to the IPO, in particular the size of the IPO, the days since incorporation (age) and profits in relation to the book value in the year of the IPO.

Similar to the other quantitative evidence, there is no significant difference for IPOs issued by the *Big Six* and other banks. Significant are only firm-specific variables, such as profit per book value or firm age, which are positively correlated with the Sharpe ratio.

In summary, neither in the short run nor within a one year period any signal to investors from the fact that one of the *Big Six* was lead underwriter or a member of the underwriter consortium can be observed.

(table 6 about here)

Conclusion

It seems established that Gerschenkrons Hypothesis that the peculiar character of Germany's financial institutions played a critical role for her industrialisation and for the fact that Germany overtook England in the late 19th century was true for the first

practice. Fohlin, *Financial Capitalism,* p.255. Furthermore, the regressions are used to test under control wether the Sharpe ratio was significantly different for the IPOs issued by the six largest banks compared to others.

three quarters of the 19th Century.[102] In the late 19th century the stock market more and more replaced loans as a major source of capital for industrial firms. According to recent research by Burhop there is no evidence that large banks could transfer their influence from the market for loans to the stock markets in the early phase of the stock market from 1870 to 1896.[103]

In this paper, I investigate the question whether the strong position of the large German banks became perceptible on the stock exchange only after 1896. This would imply that they still played a critical role for firms to overcome liquidity constraints and thus for Germany's industrialisation. And indeed, the first section of the paper provides qualitative and quantitative evidence that large prestigious banks were indeed important in the process of going public on the German stock market in the period from 1896 to 1913. However, the six largest banks, did not seem not operate as a cartel and the evidence suggests that in contrast to the stock market in the US, there was perceptible competition on the German stock market keeping short run profits and fees low.

The paper also provides evidence that there is another group that strongly benefited from the IPO business: local banks. They could gain from the underwriter business even if they did not have the market power to do it on their own, if they had well established business connections with the large banks in Berlin. They had reliable information about local firms to offer, accumulated through long term business relationships over many years and sometimes personal acquaintance with the owner, which was valuable information for the large banks. Good business relationships between firms and banks, and well established bank networks in the IPO business constituted a system in which all involved banks and firms benefited.

[102] Gerschenkron, *Economic Backwardness*, and *Europe in the Russian Mirror*.
[103] Burhop, 'Aufsichtsräte' and Burhop, 'Underpricing'.

Another interesting finding is the absence of a signalling effect to investors. Neither the initial returns were higher for IPOs issued by the *Big Six* nor did they perform better than IPOs issued by smaller banks in a one year period. Thus, although the German IPO business was in the hands of a small oligopoly, investors did not benefit from the lack of competition. This does not necessarily mean that investors were the losers of the system. Since the stock market strongly developed, investors must also have benefited. This could be due to the overall high quality of IPOs on the German stock market at the time which was partly caused by the competition between underwriters, who all tried to build up a good reputation by carefully choosing promising firms. More likely, however, is the hypothesis from a recent working paper by Burhop, Chambers and Cheffins that the tight regulation of the German stock market ensured the high quality of all firms on the stock market. They show that IPOs performed similar to the market and that almost none of the firms that went public at the end of the 19th century was delisted within five years of the IPO.[104]

[104] Burhop, Chambers and Cheffins, 'Regulation'.

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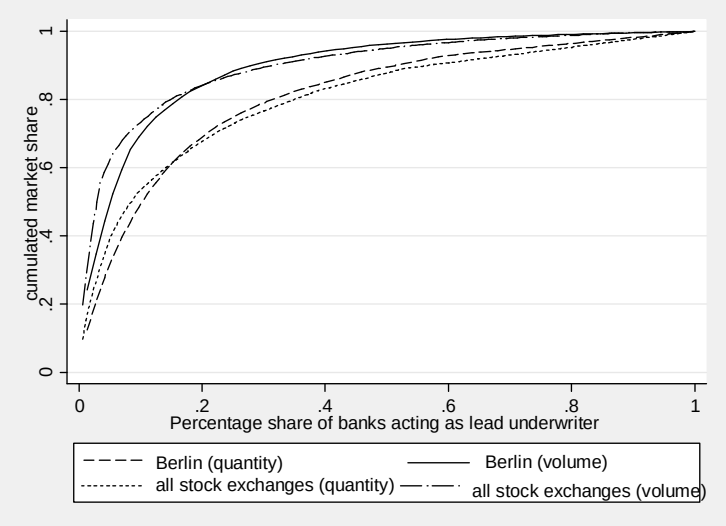
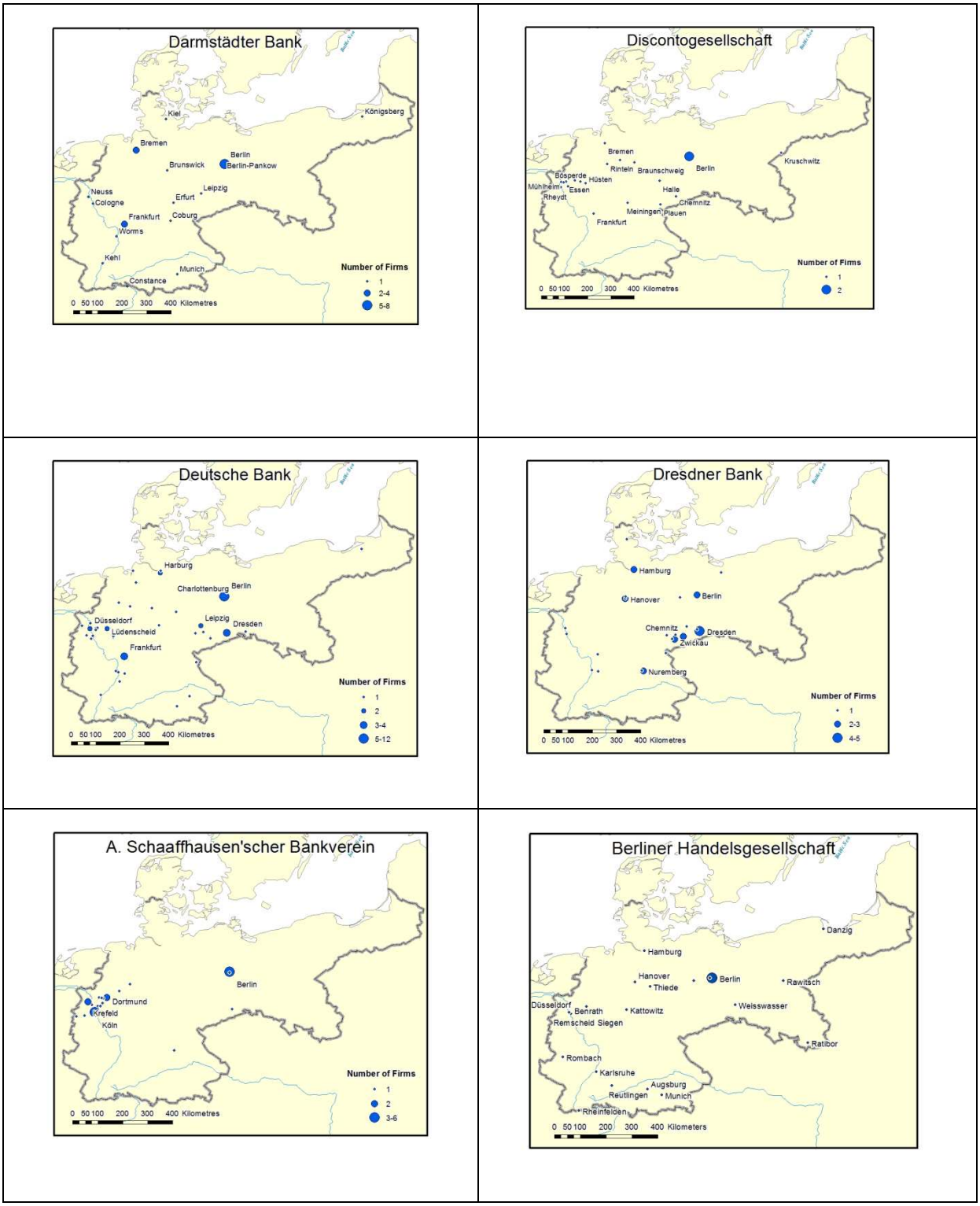
FIGURE 1: PERCENTAGE SHARE OF BANKS ACTING AS LEAD UNDERWRITER AND THEIR CUMULATED MARKET SHARE OF COMPLETED IPOS 1897-1913



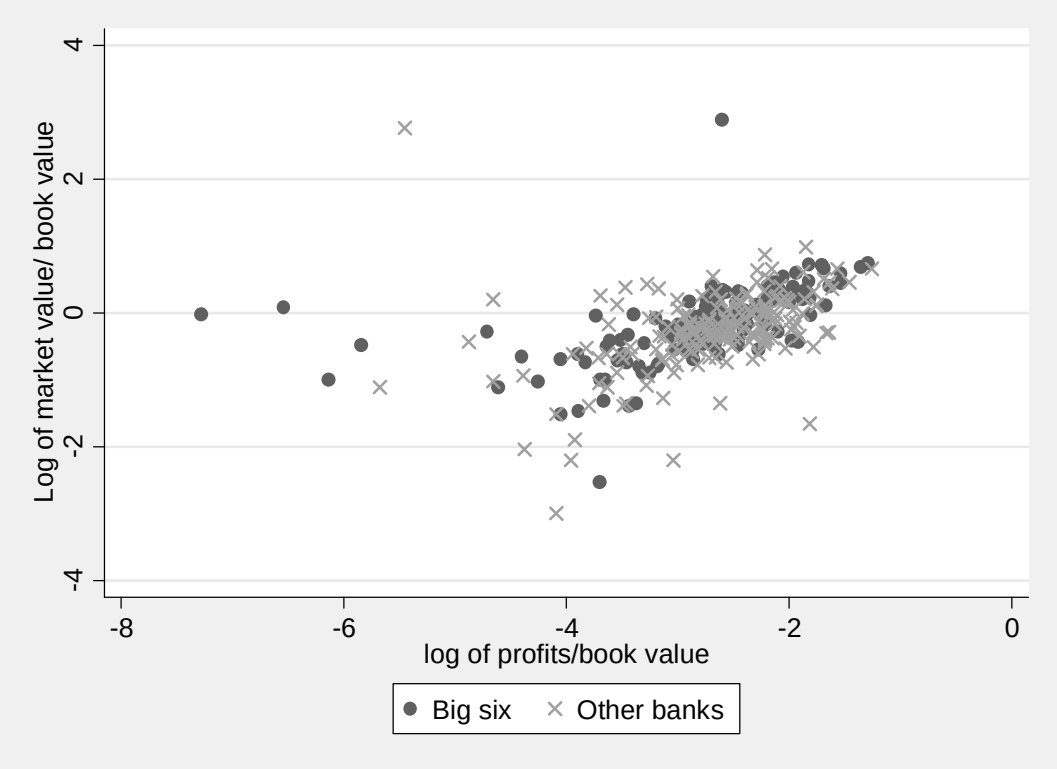
Note: own calculations, data from Vierteljahreshefte zur Statistik des Deutschen Reichs 1897-1913

FIGURE 2: HEADQUARTERS OF FIRMS BY LEAD UNDERWRITER



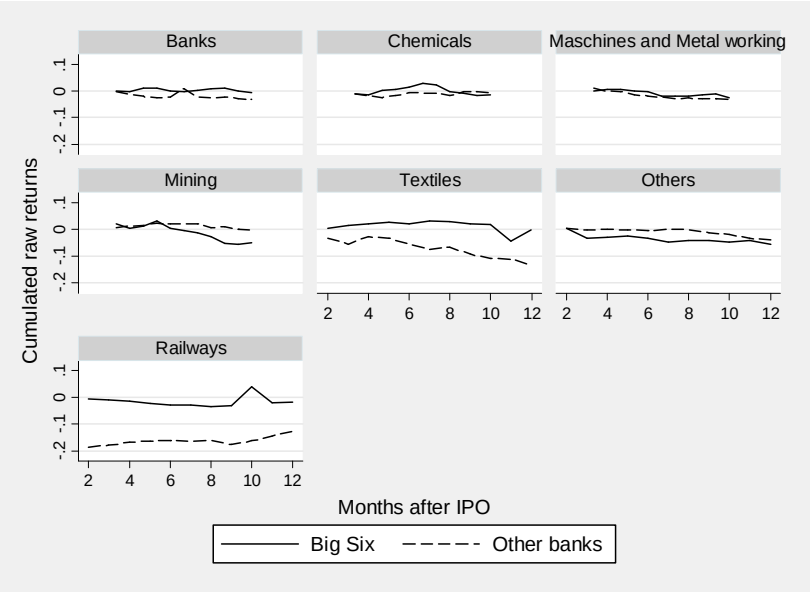
Note: data from Vierteljahreshefte zur Statistik des Deutschen Reichs 1897-1913)

FIGURE 3: RELATIVE PRICES AND EARINGS OF FIRMS THAT WENT PUBLIC; BETWEEN 1897 AND 1913



Note: own calculations, data from Vierteljahreshefte zur Statistik des Deutschen Reichs 1897-1913, Salinger Börsenhandbuch 1896 to 1913.

FIGURE 4: CUMULATED RAW RETURNS FOR THE SIX LARGEST BANKS AND ALL OTHERS FOR THE ONE YEAR AFTER THE IPO BY SECTOR



Note: Own Calculations, Data from Berliner Börsenzeitung 1896-1913.

TABLE 1: AVERAGE MARKET SHARES IN PERCENT IN NUMBERS OF IPO AND IN SIZE (VALUE) OF IPO (ALL STOCK MARKETS)

	Market share in number of IPOs					Market share in number of IPOs including bank groups				
Underwriter	**1896-1913**	**1898-1901**	**1902-1905**	**1906-1909**	**1910-1913**	**1896-1913**	**1898-1901**	**1902-1905**	**1906-1909**	**1910-1913**
A. Schaaffhausen'scher Bankverein	4.69	6.64	3.59	5.84	1.41	4.69	6.64	3.59	5.84	1.41
Darmstädter Bank	3.55	2.37	5.39	3.65	4.23	3.84	2.37	5.39	5.15	4.23
Deutsche Bank	9.38	3.79	8.38	14.60	16.20	10.38	3.79	8.98	17.65	17.61
Direktion der Diskontogesellschaft	3.13	1.90	1.80	3.65	5.63	7.82	2.37	7.19	10.29	15.49
Dresdner Bank	5.68	3.79	7.78	6.57	7.04	5,69	3.79	7.78	6.57	7.04
Berliner Handelsgesellschaft	4.12	3.32	5.39	5.84	3.52	4.12	3.32	5.39	5.84	3.52
All large banks	30.54	21.80	32.34	40.15	38.03	36.54	22.27	38.32	51.47	49.30
Herfindahl index	0.03	0.02	0.03	0.05	0.05	0.04	0.02	0.04	0.06	0.07
	Market share in size of IPOs					**Market share in size of IPOs including bank groups**				
Underwriter	**1896-1913**	**1898-1901**	**1902-1905**	**1906-1909**	**1910-1913**	**1896-1913**	**1898-1901**	**1902-1905**	**1906-1909**	**1910-1913**
A. Schaaffhausen'scher Bankverein	7.54	11.70	3.97	6.55	2.51	7.54	11.70	3.97	6.57	2.51
Darmstädter Bank	9.36	5.70	13.74	17.42	3.56	9.51	5.70	13.74	18.05	3.56
Deutsche Bank	18.80	12.75	12.12	24.81	29.68	19.46	12.75	12.43	26.55	30.77
Direktion der Diskontogesellschaft	5.78	2.96	1.62	7.15	11.44	8.49	3.21	5.61	9.67	17.14
Dresdner Bank	6.42	6.86	10.21	5.73	5.03	6.42	6.86	10.21	5.74	5.03
Berliner Handelsgesellschaft	7.83	5.21	14.39	12.37	2.51	7.83	5.21	14.39	12.37	2.51
All large banks	55.72	45.17	56.05	74.02	54.72	59.24	53.90	62.86	78.83	61.51
Herfindahl index	0.07	0.05	0.07	0.12	0.12	0.08	0.05	0.08	0.14	0.14

Note: own calculations, data from Vierteljahreshefte zur Statistik des Deutschen Reich

TABLE 2: AVERAGE AND MEDIAN INITIAL RETURNS AND MARKET ADJUSTED INITIAL RETURNS FOR THE SIX BANKS AND THEIR BANK GROUPS

		Initial returns (IR)	Market adjusted Initial returns (IR_m)	Initial returns (IR)	Market adjusted Initial returns (IR_m)
		Mean		Median	
1896-1913	Big 6	4.47 a)	4.24 a)	1.89	1.83 b)
	others	3.00 a)	2.49 a)	1.15	1.16 b)
1898-1901	Big 6	6.07 a)	5.26 a)	1.83	1.50
	others	2.34 a)	2.05 a)	1.37	1.24
1902-1905	Big 6	3.37	3.51	2.21	2.46
	others	4.13	4.07	2.00	2.61
1906-1909	Big 6	3.31	3.35	1.48	1.56
	others	4.36	3.64	2.50	1.39
1910-1913	Big 6	3.33	3.34	0.92	0.95
	others	2.93	2.95	0.50	0.55

Note: Difference between the large banks and others have been tested using a simple ttest and a Wilcoxon–Mann–Whitney U two-sample test. Significance at 5% level are indicated with **a)** and **b)** respectively.

TABLE 3: REGRESSION RESULTS UNDERPRICING

	(1)	(2)	(3)	(4)
Dependent Variable	Market adjusted Initial return			
Big Six (Lead underwriter)	1.018	0.973		
	(1.15)	(1.02)		
Big Six (Underwriter consortium)			1.025	0.801
			(1.18)	(0.85)
Size of the issue (standardized)	-0.006	0.006	-0.006	0.010
	(0.11)	(0.10)	(0.10)	(0.16)
Size of SEO in % of IPO	0.033	-0.014	0.036	-0.017
	(0.14)	(0.07)	(0.15)	(0.08)
SEO within 5 years=1	0.299	0.509	0.319	0.516
	(0.22)	(0.38)	(0.24)	(0.39)
Past market return	5.786	7.274	5.858	7.382
	(1.11)	(1.25)	(1.13)	(1.27)
Days since incorporation (st.)		-0.000		-0.000
		(1.32)		(1.25)
Profit per book value in year of IPO		0.405		0.390
		(0.89)		(0.87)
Constant	-30.744	-41.045	-31.122	-41.596
	(1.15)	(1.34)	(1.16)	(1.36)
Time fixed effects[1]	Yes	Yes	Yes	Yes
Sector fixed effects[2]	Yes	Yes	Yes	Yes
Observations	202	181	202	181
R-squared	0.06	0.11	0.06	0.10
F	3.17	3.06	3.16	3.06
F>P	0.000	0.000	0.000	0.000

Robust t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

[1] To reduce the number of dummy variables, time fixed effects were period fixed effects: 1896-1913, 1898-1901 1902-1905, 1906-1909 and 1910-1913.
[2] To reduce the number of dummy variables Textiles, Chemicals, Metal working and Mining were treated as one group (Industry) in the regressions.

TABLE 4: GUIDELINES ABOUT HOW TO CHECK THE CREDIBILITY AND PERFORMANCE OF INDUSTRIAL FIRMS (BERLINER HANDELSGESELLSCHAFT)

A.	Area	
	Economic needfulness	Size of the sales territory, possibilities to expand, dependency on exogenous factors (business cycles, state of technology)
	Raw materials	endowment, availability, dependency on exogenous factors (harvest) or speculation (cotton)
	Position on the World market	favoured countries of production, export, imports, tariffs, transport possibilities, storage stability
B.	Special conditions	
	Position of the firm	Access to raw material, sales territory and labour market, train stations, river and canals, distance to the sea.
	Methods of production	Patents, methods, state of technology compared to competitors, Possibilities of new competitors based on technology, labour force and machines
	Factory	Value in relation to business volume, Usability in the case of technological improvements.
	Work force	Number and quality of workers, wages, productivity, workers organisation, number of strikes
	Raw materials	price and quality, necessity to store, variability of prices, all compared to competitors, conditions of payment, Monopolies, Trusts, Dependency on subcontractors, ratio of raw material prices to final product prices.
	Sales	market conditions, demand, quality of the products, compared to competitors, influence on prices, competition from abroad, export, competing products, sales territory.

Table 4: continued

C.	Administration and management	
	Organisation of management	Structure and organisation of the firm, especially purchasing and sales department, book-keeping.
	Organisation of the factory	master craftsmen, lead worker, storage administration, material charge and control, factory statistics, calculation of manufacturing costs
	Sales organisation	Methods of sales, control of branches, marketing, number of branches
	Bookkeeping and statistics	monthly balance sheets, methods, evaluation of stock, bookkeeping of branches, reports, statistics
D.	Money and profit	
	Investment	
	Firm capital	raw materials, semi- finished products, products, debtors, liquid fund, bills of exchange, in relation to business volume and in relation to Investment.
	Business Volume	in relation to capital, labour input, Statistics per year and sales area.
	Costs of production	Raw material and auxiliary material, wages, business costs, administration costs, taxes, insurances, depreciation, repayments. Changes of manufacturing costs, statistics, profit coefficient, distribution of costs on different products.
	Profits	Composition, variation, special profits. Profits from branches and how they are counted
	Fundraising	Capital, mortgage, long run and short run loans, savings, creditors.
	Reserve assets	Funds, contingency reserves, evaluation of reserves, hidden assets
E.	Others	
	History and development if the firm, highlights, forecasts, dependency on individuals and off-side facilities	
	Evaluation of owner and leading management, evaluation by a competitor	
	Interrelation with other business of the owner, size in relation to business volume and benefit	
	Special Forecast	Usability of property, new methods, possible improvements.
	Complications, legal proceedings, loan guarantees, recoveries.	

Source: Memo Dr. Rathenau 27 July 1906 “Grundsätze für die Prüfung industrieller Unternehmungen”. R 8127 / 14069.

TABLE 5: DISTRIBUTION OF IPOS ON DIFFERENT SECTORS IN PERCENT FOR THE SIX LARGEST BANKS AND ALL OTHERS

		1896-1913		1898-1901		1902-1905		1906-1909		1910-1913	
		Large Banks	others	Large Banks	others	Large Banks	others	Large Banks	others	Large Banks	others
	Berlin only										
Size of IPOs	Banks	6.4	16.5	4.9	22.2	2.9	0.0	6.6	2.1	4.8	23.8
	Chemicals	6.0	4.2	0.0	0.5	2.9	3.1	3.2	9.4	20.4	10.0
	Machines, Metal working	34.1	20.3	53.5	15.1	30.7	14.5	30.4	15.2	26.3	36.9
	Mining	12.4	8.8	2.4	11.0	4.1	21.3	20.3	5.0	19.4	0.0
	Textiles	3.9	5.9	0.0	9.5	3.2	3.9	3.8	5.0	9.3	2.4
	Others	32.5	38.4	25.0	30.5	51.3	49.5	34.5	63.3	19.8	26.9
	Railroads	4.7	5.9	14.1	11.2	4.7	7.7	1.2	0.0	0.0	0.0
	Regional stock exchanges										
Size of IPOs	Banks	17.0	8.0	0.0	18.2	6.4	6.6	45.0	3.9	0.0	2.1
	Chemicals	7.5	10.1	21.2	4.0	5.4	19.0	5.4	7.7	0.0	15.1
	Machines, Metal working	11.8	25.6	0.7	21.5	11.5	25.4	10.0	38.5	26.2	24.6
	Mining	3.5	4.9	3.7	0.0	3.8	17.2	1.9	1.2	5.4	4.0
	Textiles	7.4	4.9	0.0	6.2	14.9	5.5	5.2	4.9	10.0	3.5
	Others	52.8	43.1	74.4	46.1	58.1	24.1	32.6	43.9	58.4	45.1
	Railroads	0.0	3.4	0.0	4.0	0.0	2.2	0.0	0.0	0.0	5.7

Source: own calculations, data from Vierteljahreshefte zur Statistik des Deutschen Reichs

TABLE 6: REGRESSION RESULTS SHARPE RATIO

	(1)	(2)	(3)	(4)
Dependent variable	Sharpe ratio			
Big six (Lead underwriter)	0.005	0.005		
	(0.58)	(0.50)		
Big six (Underwriter consortium)			0.005	0.005
			(0.58)	(0.51)
Size oft the issue	-0.001	-0.000	-0.001	-0.000
	(1.37)	(0.78)	(1.38)	(0.78)
Past market return	-0.098	-0.073	-0.097	-0.073
	(1.89)*	(1.33)	(1.88)*	(1.32)
Days since incorporation (st.)		0.000		0.000
		(5.98)***		(6.03)***
Profit per book value in the year of IPO		0.010		0.010
		(1.76)*		(1.76)*
Constant	0.485	0.357	0.483	0.355
	(1.79)*	(1.22)	(1.78)*	(1.21)
Time fixed effects	Yes	Yes	Yes	Yes
Sector fixed effects	Yes	Yes	Yes	Yes
Observations	276	258	276	258
R-squared	0.16	0.18	0.16	0.18
F	3.78	9.17	3.81	9.08
p>F	0.000	0.000	0.000	0.000

Robust t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

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