Investors and Investment Behavior in Germany, 1869 – 1955

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Abstract

This dissertation is part of the project "Expectations and Experiences: What governed investment in banking stocks (1897 – 1931)?" It belongs to the Priority Programme 1859 "Expectations and Experiences: Historical Foundations of Economic Behavior" (Schwerpunktprogramm 1859 "Erfahrung und Erwartung. Historische Grundlagen ökonomischen Handelns"), which is funded by the German Research Foundation (Deutsche Forschungsgemeinschaft). The overall aim of the Priority Programme is to study the historical dimension of economic expectations. Economic expectations are the keystone of economic behavior, but their historical dimension has not been researched in depth so far. It studies experience and expectation as interrelated cognitive processes pointing to the past and the future which enable economic actors to realize their decisions in the present.[1]

The central purpose of this dissertation is at studying investors' characteristics, as well as investment decisions on the different German stock exchanges in the period 1869 to 1955. Furthermore, this thesis studies the influence of experience on investment decisions by looking at the investment behavior of one single investor over time. Increasing our knowledge of investors and how they built expectations therefore crucially improves our understanding about the economic and political situation in Germany in the considered time period.

In chapter 1, I give a brief introduction and motivation why investors' characteristics, investment behavior and investment decisions should be studied from a historical point of view.

Thereafter, I offer three studies that reveal typical characteristics of investors and their investment behavior over time.

In chapter 2, I first of all present the investors database, I hand-collected from different archival resources. This new and unique database provides the basis for the analyses in chapter 3, chapter 4 and chapter 5.

The third chapter presents a study of investors' characteristics and the ownership structure of joint-stock firms for the period of 1869 to 1945. It is shown that after the hyperinflation of 1923, when shares became cheaper, the ownership share among lower social classes rose

[1]For more details about the Priority Programme, visit the website of the Priority Programme 1859 "Experience and Expectation. Historical Foundations of Economic Behaviour": https://www.experience-expectation.de/.

significantly. Moreover, with the rise of women rights after 1919, the number of shares owned by women also increased significantly. However, despite these shifts, the majority of shares remained in the hands of institutional investors and investors from the upper class.

The fourth chapter analyzes investors' expectations and investment decisions in regional stock exchanges in Germany from 1898 to 1934. The statistical analysis, which is based on shareholder lists attending general meetings first indicates that local investment was clearly important during this period. Then, challenging these findings and analyzing different sub-samples, suggests that investors' home bias is potentially overestimated using this kind of source. In a supplementary exploration of so-called shareholder books, it is shown that the home bias phenomenon was indeed present.

Chapter 5 shows, that the bias towards local investments can to a large extent be explained by overall economic and political circumstances, the general performance of the market and the level of activity of the investor. The examination of portfolio choices over the period 1923 to 1955 of the private banker Joseph Frisch, in Stuttgart, reveals that the preference for local shares was highest in times of insecurity, low returns and reduced investment activity. Furthermore, the analysis of diary entries of an investor from the late 19th century provides insights into his investment behavior.

Lastly, chapter 6 gives a general conclusion and a brief outlook about future research.

Contents

List of Figures

List of Tables

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"WYSIATI - What you see is all there is."

Daniel Kahneman, Nobel Prize in Economics 2002

1 Introduction

In 2015, DALBAR — a research firm on financial services — released the 21st Edition of Dalbar's Quantitative Analysis of Investor Behavior (QAIB) (Dalbar 2015). Looking at monthly investor returns of the last 30 years, it shows that investors underperformed the S&P 500.[1] The greatest extent to which underperforming occurred was in October 2008, with a net underperformance of 7.41 percentage points, and in March 2000, with a net underperformance of 6.06 percentage points. Why does this occur? Dalbar attributes the results to bad investment decisions arising from a lack of preparedness of the investors.

A decision to buy and/or hold stocks is complex and takes place in most of cases under

[1] The S&P 500 is an American stock market index. It compromises the shares of 500 of the largest listed US companies.

uncertainty (Peterson 2009, p. 3). Economic actors try to build expectations about future returns and risks to reduce this uncertainty. They acquire information on the future development of certain firms, the overall economy and the political situation. Moreover, they observe and interpret the investment behavior of other investors. Therefore, the available set of information and investors' ability to interpret these are important and influence their expectations. The knowledge to interpret the given information is built on experience (see, e.g., Greenwood and Nagel 2009; Malmendier and Nagel 2011, 2015; Cici et al. 2018) and their socioeconomic profile (level of education, age, gender). Furthermore, the self-confidence of investors to trust their own knowledge and follow other investors' decisions plays an important role.

From the perspective of financial research, the investigation of investment decisions on stock markets is particularly interesting since one observes types of investment behavior, which finance models have failed to predict so far. As Markowitz (1952) pointed out in the 1950s, portfolio theory assumes that investors form expectations about return and risk of securities and select their portfolios according to their risk preference. As a consequence, rational economic actors should diversify their portfolio. But instead, at least for modern periods, it can be shown that investors take highly idiosyncratic risk, under-diversify their portfolios or gamble with stocks, which is possibly driven by overconfidence and herding behavior (Odean 1998, Chang et al. 2000, Bikhchandani and Sharma 2001, Glaser and Weber 2007, Goetzmann and Kumar 2008, Calvet et al. 2007, Kumar 2009).

There is also evidence that they use complex investment strategies, which differ from the pure mean-variance optimization[2] (Lewellen et al. 1977, Grinblatt and Keloharju 2000). Fur-

[2]Mean-variance optimization means that investors make investment decisions according on how much risk they are willing to take compared to different levels of return. They are weighting the risk, expressed as variance,

thermore, a vast amount of studies concludes that there is a strong preference of investors investing in shares of firms from their hometown or home country[3] instead of diversifying their portfolios with both domestic and foreign shares. This form of investment costs investors a lot of money and is often also discussed by the press.[4]

Moreover, previous research has shown that socioeconomic characteristics of individual investors influence their expectations and investment decisions (Jianakoplos and Bernasek 1998, Barber and Odean 2001, Dwyer et al. 2002, Goetzmann and Kumar 2008, Kumar 2009, Sapienza et al. 2009, Dohmen et al. 2011). Younger, low-income, less-educated and less-sophisticated investors under-diversify their portfolio in a stronger way. Female investors have different levels of risk-aversion than male investors. These findings suggest that the link between changes in the socioeconomic characteristics of investors and stock market behavior might be stronger than is currently believed.

As these studies show, there is quite some research on the investment behavior of shareholders and their socioeconomic characteristics in modern periods, with regard to these different anomalies. However, there is still room for research because these anomalies are not completely understood empirically. For example, studying investment behavior from a historical perspective contributes to a better understanding of the home bias phenomenon because it enables us to have a long-run perspective and exploits the variation over time, such as, for instance, different types of regimes. Furthermore, there is little information about individual investors and no analyses of investors' characteristics and expectations in Germany

and comparing it against the expected return. Following this approach allows investors to find the biggest return given a certain level of risk (see, e.g., Markowitz and Todd 2000).

[3] This so-called home bias is, at least for modern periods, highly researched. For a recent review, see Coeurdacier and Rey (2013). For an overview of the current literature of home bias in modern and historical financial literature, see chapter 4 and chapter 5.

[4] See, e.g., Frankfurter Allgemeine Zeitung 27 December 2016 and Die Welt 19 February 2018.

in historical periods so far.

Therefore, this thesis seeks to gain insights about which factors mattered most for investors' expectation and investment decisions on the stock market in the period 1869 to 1955. To improve the interpretation of investors' stock market behavior, it is therefore necessary first to learn more about investors and their characteristics and how their characteristics changed over time and influenced their investment behavior. In a second step, this thesis deals with investment behavior in general. I study whether there was a home bias to the benefit of geographically close firms and whether this evaporated over time. Third, I study the reasons for the investors' home bias by analyzing the investment decisions of an investor over his lifetime.

Many papers aim to understand investors' expectations in this period. For example, Kling (2006) and Lübbers (2008) ask how firm mergers were anticipated. Lehmann-Hasemeyer et al. (2014) investigate how investors react to suffrage extensions. Opitz (2017) studies how investors anticipate riots, wars and revolutions. But all of these papers make only assumptions about who the investors were. However, one thing that is missing is a detailed description of investors' characteristics.

Regarding the historical research on investors' characteristics, one can find lists of applicants of shares, such as, for instance, the list of the first buyers of shares of Deutsche Bank in 1870 (Pohl 1987). A pioneering study of historical investors in Germany is provided by Franks et al. (2006). They investigate the ownership structure of 55 German companies. But none of these include an analysis of investors' characteristics or investment behavior. The first obvious characteristic of all shareholders, which is discussed in historical research, is that they were relatively rich since shares were increasingly expensive (Burhop 2011). Therefore, it seems unlikely that workers or even middle-class employees held shares.

Angela Bol (2018a and 2018b) examines the ownership of Deutsche Bank, Allgemeine Elektricitäts-Gesellschaft (AEG), Siemens and Berliner Handels-Gesellschaft (BHG) between 1870 and 1930. She shows that the shares of Deutsche Bank were widely held whereas the BHG, AEG and Siemens had a concentrated shareholder structure. The first qualitative and quantitative studies of individual investor´s behavior in a historical context (not for investors in Germany, but in the UK), were recently published by Chambers and co-authors. In a series of papers, they explore the investment behavior of John Maynard Keynes between 1921 and 1946 (Chambers and Dimson 2013, Chambers et al. 2015, Accominotti and Chambers 2016, Chambers and Kabiri 2016). For the UK, there is also a study by Rutterford et al. (2017), who investigate a historical home bias for London and non-London investors.[5]

Another contribution related to the home bias is given by Burhop and Lehmann-Hasemeyer (2016). They explore listing decisions of firms on the different German stock exchanges in 1913. They find evidence that larger firms tend to list on the Berlin stock exchange, whereas smaller firms listed their shares on regional stock exchanges. Beside asymmetric information between the issuer and the investor, they explain their findings with an investor's home bias.

In a contemporary study, Wormser (1919) shows that 30 percent of the financial wealth was concentrated in three cities. For example, for the Frankfurt stock exchange, wealthy citizens were an important factor in attracting capital to the stock exchange.

Furthermore, the interwar period saw great changes in wealth distribution.[6] Low growth rates, repeated recessions and high inflation led many wealthy people to lose vast amounts of their assets. The post-war inflation was a historical event that changed access to stocks. It

[5]For the UK, there is a lot of research on historical investors and corporate ownership. To name only a few studies, see chapter 2 of this dissertation.

[6]See for instance Beer 1999, pp. 156-163.

brought more opportunities for people from lower social classes, which means that at least some shares may have become accessible to a larger audience with different experiences and different socioeconomic backgrounds. In this case, it is not about regional preferences of the people, but rather a behavioral shift of the people toward shares. The question is whether this is also reflected in the ownership structure of joint-stock companies. However, Aron (1927) showed that although large amounts (about 53 percent) of capital of joint-stock companies were shifted among groups of investors, firms made sure that most shares were traded among large shareholders by granting them special conditions such as buying shares on account.

To close the gap about what we know of historical investors, chapter 2 introduces the investors' database. I hand-collect a new and unique dataset that includes information of more than 10,000 individual investors. The investors' data are taken from archival resources containing lists of shareholders who attended a firms' general assembly. Moreover, I use so-called shareholder books of different companies to get information about individual investors. Furthermore, I examine portfolio choices over the lifetime of a single private banker. Last, I evaluate a diary of a private investor. However, since the analysis is based on rare and fragmentary archival material and the material also has some shortcomings, I will only improve our picture of the typical investors, rather than get a perfectly clear idea of his/her/its typical characteristics and investment behavior.

Chapter 3 then reveals typical characteristics of investors in more detail by systematically exploring the available information based on 785 investor lists of general assembly meetings of 276 firms. In a joint work with Sibylle Lehmann-Hasemeyer, I study the ownership structure of joint-stock firms for the period of 1869 to 1945 based on this unique hand-collected dataset. We show that after the hyperinflation of 1923, when shares became cheaper, the ownership

share among lower social classes rose significantly. Moreover, with the rise of women's rights after 1919, the number of shares owned by women also increased significantly. However, despite these shifts, the majority of shares remained in the hands of institutional investors and investors from the upper class, who mainly constituted and controlled the general meetings. Thus, despite the increased participation of women and the lower social classes, a strong inequality of opportunities persisted.

As mentioned, a further gap between the prediction of theoretical finance models and the observed individual investment behavior in reality is the so-called 'home bias'. The home bias literature indicates that instead of diversifying their portfolios and holding domestic as well as foreign assets and shares, investors prefer assets and shares from their home country and home region.

Chapter 4 provides a study on investors' home bias from a historical point of view. It studies investors' expectations and investment decisions in regional stock exchanges in Germany from 1898 to 1934. I examine data on investors' characteristics to understand local investment biases using data from regional stock exchanges in Germany from 1898-1934. The statistical analysis first indicates that local investment was clearly important and that the existence of a historical home bias is present during this period. Since the analysis is based on attendance lists of shareholders attending the general assembly of the company and there is no information on investors who did not attend the assemblies, I challenge these findings in a next step, by analyzing different sub-samples. The results suggest that investors' home bias is potentially overestimated. Previous studies, which found evidence of local investment biases in Germany have presumably overestimated this effect. This is due to the fact that the probability of investors to attend such assemblies is higher for those who live in the same resort than

the general assembly is taking place.

Analyzing the shareholder books of the Metallgesellschaft AG in 1919, the Metallbank and Metallurgische Gesellschaft AG in 1925 as well as the Mittelschwäbische Überlandzentrale Giengen AG in 1925 also contributes to investors' home bias. The advantage of these sources is that the analysis is now unbiased in terms of investors, who attended the general assemblies, that might have led to a home bias toward people that lived close to the meeting, but the analysis is based on registers of shareholders at a given point in time. It shows that a regional firm, like the Mittelschwäbische Überlandzentrale Giengen AG had a regional shareholder structure and listed its shares on a regional stock exchange. Whereas, the Metallgesellschaft AG, which was a diversified company with lots of branches and subsidiaries listed the shares on more than one stock exchange. The shares were traded on important stock exchanges like e.g. the Berlin stock exchange or the Frankfurt stock exchange to attract capital. Since I also have information on the portfolio of the investors of the Metallbank und Metallurgische Gesellschaft AG, I can show that the interest in local shares was high among the investors. However, this study is not representative since it is only based on three specific companies.

Since the article in chapter 4 does not study the reasons for an investor's home bias, chapter 5 investigates this more closely using portfolio choices over the lifetime of the private banker Joseph Frisch in Stuttgart. Here, Sibylle Lehmann-Hasemeyer and I show that the bias toward local investments can to a large extent be explained by the overall political and economic circumstances, the general performance of the market and the level of activity of the investor. We find that the preference for local shares was highest in times of insecurity, low returns and reduced investment activity. With higher returns, a stable and growing economy and more experience, the preference for local shares decreased.

In addition, the diary of the investor Gustav Schlott provides interesting insights into the investment behavior during the late 19th century. As a school inspector, Schlott belonged to the upper class of the society. Also, his salary surpassed that of a factory worker by a multiple mark. Consequently, the findings by previous research (Burhop 2011) that the investors were a wealthy circle of customers also apply here.

Looking beyond these findings, the articles in this chapter close the gap on what we know about investors in historical periods. To improve the interpretation of investors' stock market behavior, they provide a clearer picture of the different forms of investors' home bias and how it changed over time.

To summarize, based on a newly constructed dataset, this thesis largely improves our knowledge about the socioeconomic characteristics of investors in general to a large extent by providing information on the ownership structure of joint-stock firms and the composition of shareholders for the period from 1869 to 1945. This thesis also improves our picture about the investment behavior of investors during that time. It first shows that investment in local firms was probably overestimated because the underlying data on attendance lists of shareholders attending the general assembly of the company have some shortcomings. Nevertheless, using other sources such as shareholder registers confirms that local investment was clearly important during that time. Furthermore, based on the portfolio of the private banker Joseph Frisch, it additionally shows an investors' home bias that seems to become more apparent in times of insecurity and financial turmoil. This newly gained understanding of investors helps future research. Having information about share ownership is especially important for further studies of investment behavior or stock market behavior. It is also important to gain insights about which factors mattered most for investors' expectations.

2

Who Invested in Stock Market Shares? Investors' Data and Descriptive Patterns

Until now, there have been no systematic data containing information about investors in Germany in the period of 1869 to 1955.[1] The reason is that most of the shares were bearer

[1]For the UK, the picture looks different. Here, historical corporate ownership data for the 19th and 20th century are available. For example, under the 1856/1862 UK corporate law, firms were required to submit shareholder registers to the Registrar of Companies (Acheson et al. 2015). Acheson et al. (2017) investigate the Victorian equity market in the second half of the 19th century and analyzed the investment behavior of more than 172,000 shareholders. In addition, they analyze the occupational composition of shareholders and also find evidence that there was a growth in female investors over time. Female investors invested more in safe investments, whereas e.g. institutional investors speculated mostly in foreign firms. Acheson et al. (2018) study female investors participating on the stock market. The results confirm that female shareholders acted independently of men. It appeared that female investors invested solo and were not influenced by men. Also, post-1900

shares, which means that there are no systematic shareholder files of firms containing information about individual investors, as there are, for example, in the UK (Burhop 2011). Companies did not have to publish major shareholders with a specific shareholding. Shareholders therefore remained anonymous.

The only somehow systematic available data on share ownership in the archives are shareholder lists of general assemblies. Firms had to provide these lists to the stock exchange operator of the respective stock exchanges if they wanted to list their shares at the respective stock exchange. Thus, shareholders had to register their shares when they attended the general meeting of a firm. This became law under the Stock Exchange Act in 1896 (Franks et al. 2006). Searching for these shareholder lists in the economic archives is difficult and time-

data are available (see e.g. Foreman-Peck and Hannah 2012). They especially explore the voting control of board members of UK companies and show that they owned only 3.4 percent of the shares which indicates a lower level of voting control. In addition, Rutterford et al. (2011, 2017) explore the ownership of shares as well as investment behavior using a detailed sample of shareholder records of UK companies between 1870 and 1935. Regarding data on individual investors in the UK, Chambers and co-authors examine the investment behavior of John Maynard Keynes (Chambers and Dimson 2013; Chambers et al. 2015; Accominotti and Chambers 2016; Chambers and Kabiri 2016). The articles illuminate his investment behavior from 1921-1946 during his time as the person in charge of the assets of King's College in Cambridge. He was one of the first investors to invest the majority of the foundation's portfolio in equities, which asset class at that time was considered risky and was avoided for that reason. The portfolio Keynes constructed contained equities from small and medium-sized UK companies and switched between stocks with a high or low dividend yield, depending on the market situation. In addition, he bundled his shares mainly in the two sectors, metal mining and industry and trade. Initially, Keynes pursued an active top-down investment strategy. He used monetary and economic indicators to identify and buy profitable stocks at the beginning of their appreciation in the market, while selling equities that were not profitable. With this strategy, he achieved only sobering results, and therefore, he changed his investment strategy towards the end of the 1920s. Keynes now followed a bottom-up, buy-and-hold approach that analyzes the fundamentals of companies to identify undervalued stocks in the market. With this new investment strategy, he made notable profits, and his portfolio performance even outperformed the UK equity market. Keynes also made investments in the US stock market on behalf of King's College. In 1929, he began to diversify the foundation portfolio, which previously was comprised of British equities, with US equities. As with his British investments, he also valued a thoroughly and carefully conducted fundamental analysis. In selecting stocks, he used research resources from American brokers and held meetings with policy-makers and managers of some of his most significant investments. He concentrated his portfolio primarily in corporations, industrial companies and public utilities and avoided the banking and railway sectors as much as possible. With his investment strategy Keynes was far ahead of his time and very successful, so he serves as an example to investment giants like Warren Buffet even today.

consuming. Often there are only a few shareholder lists of companies, so it is difficult to get a full series of shareholder lists of a company over a longer period of time. Therefore, one only can find a few studies dealing with investors or investors' characteristics and investment behavior from a historical perspective in Germany so far.

A first impression on the total number of the potential people who owned shares gives a statistic published by the Reichsbank in the German Empire (Reichsbank 1876-1900, p. 408). The Reichsbank provides data on the number of depositors and on nominal values of depots of securities for the years 1886 to 1900. For example, in 1900, the number of depositors was 68,228. This was 0.12 percent of the total population in Germany. Calculating the average depot size per depositor shows a depot size of 42,340 marks per depositor. This was about 32 times higher than the average annual wage of a German industrial worker in 1913 (1,300 marks, see Bry 1960). So the proportion of those who owned shares was probably very small and mostly limited to people from higher social classes.

Pross (1965, pp. 61ff.) provides a short insight into the shareholders of the late 19th century and early 20th century. They mostly came from different social classes of the bourgeoisie. Among them there were people of highly educated classes, officials and academics. These shareholders had in some cases also inside positions in the administrative boards of the companies. For example, since 1870, the administrative board of the Darmstädter Bank für Handel und Industrie consisted of a principal, state councillor, ministerial councillor and a cabinet councillor. At the end of the 19th century also the aristocracy began to buy shares. They started to invest their ground rents ("Grundrente") as a profitable investment in shares. Occasionally, people from the middle class owned shares.

Furthermore, Schäffle (1885, pp. 110f. and p. 236 cited by Pross 1965, p. 63) assumes that

the shareholders of the late 19th century came from all social classes of the society. Women, who wanted to invest their inheritance of their husbands, cooks, officers, merchants, rentiers, postmen, farmers, washerwomen, bankers and also widows with low income and a lot of children to bring up. However, the assumption that so many people from lower social classes owned shares seems not appropriate, since the amount of the nominal value of a single share was very high. Therefore, it is more appropriate that wealthier people invested their money in shares and that e.g. farmers invested only in a few special cases.

The total number of the potential people holding shares in the Weimar Republic can easily be found in the "Vermögenssteuerstatistik". It reports all persons who were affected by the property tax (Statistisches Reichsamt 1931, p. 7). The wealth tax affected all legal persons with assets of more than 5,000 Reichsmark (RM) and all natural persons with assets of more than 10,000 RM and an annual income of 3,000 RM (Ibid., p. 26-28). In total, there were 759,642 people whose capital assets were taxed. This accounted for 1.2 percent of the total population, which was also a very small proportion.[2]

The historian Franz J. Bauer gives a further impression of investors' characteristics in his habilitation thesis "Familienbiografische Untersuchungen zum deutschen Bürgertum im 19. Jahrhundert" (Bauer 1991). Here, he provides insights into the social and financial ascent of the family Dohrn from Stettin. The family drew their financial wealth for the most part from the Pomeranian Provincial Sugar Dairy (Pommersche Provinzial-Zuckersiederei), which Heinrich Dohrn, who also owned a successful trading company, founded in 1817 along with other prestigious merchants. The company was one of Prussia's first and most successful commercial companies. This becomes clear from the fact that the capital employed by the first share-

[2]For the period of the Third Reich the number of people with taxable capital was even smaller and accounted for only 0.76 percent of the total population (Statistisches Reichsamt 1938)

holders increased eightfold within the first 30 years. From the beginning, the family was one of the major shareholders of the Pomeranian Provincial Sugar Dairy and achieved thereby between 1817 and 1909 a total income of 5.6 million marks. The sheer size of the family's annual income from sugar-making becomes clearer if it is compared to the income of other occupations and status groups at that time. The wealth of the family enabled the son Carl August a life as a man of private means. Moreover, the family Dohrn was able to move up to the upper classes because of successful equity investments.

Pohl (1987) describes the first buyers of the Deutsche Bank AG in 1871, who provided the necessary start-up capital. The founding committee consisted of six persons, all but one of whom were private bankers. They all subscribed for shares of the Deutsche Bank and were able to acquire many other important investors through their good networking. A total of 76 people and companies provided the necessary start-up capital of 5 million thalers. The donors were mainly influential banks, bankers and entrepreneurs from the industrial sector. However, Pohl's work does not include any analyses of the investors' characteristics.

A pioneering study of historical investors in Germany that uses 156 shareholder lists from 55 companies[3] comes from Franks et al. (2006). They analyze the ownership structures of companies from 1890 to 1950. They find evidence that ownership concentration has been high in Germany and increased slightly over time. Furthermore, inside owners, like e.g. members of the supervisory board, were more important compared to outside owners. Moreover, they show that banks and other firms had more voting power than individuals. Banks mostly acted as intermediates and cast proxy votes for other investors (Franks et al. 2006, pp. 563f., 568, 576f.).

[3] The 55 companies were listed at the regional stock exchanges in Munich and Frankfurt/Main.

Following the approach of Franks et al. (2006), Burhop and Lehmann-Hasemeyer (2016) carried out a further empirical analysis of investors' investment behavior in Imperial Germany. They demonstrate the so-called home bias for the financial capital, Berlin, for a small sample of 32 shareholder lists from 16 different companies. They show that for companies based in Berlin, about 60 percent of shareholders representing about 60 percent of the capital also lived in Berlin, concluding that local investment was important and that something like an investors' home bias existed.

Angela Bol (2018a and 2018b) examines the ownership structure of Deutsche Bank AG, AEG, Siemens and BHG between 1870 and 1930 by using a sample of 30 shareholder lists of the general meetings. She shows that Deutsche Bank had more than 200 shareholders, that were present at the general meetings. The bank had no single dominant shareholder and the shares were widely held. Moreover, banks and inside shareholders dominated the general meetings of Deutsche Bank. In comparison to Deutsche Bank, BHG, AEG and Siemens had a concentrated shareholder structure with one or more major shareholders. However, the concentration of share capital did not increase steadily in all companies. It declined slightly during the inflation years of the 1920s. The number of inside shareholders was high in all three companies. Large banks were important shareholders at AEG and BHG. The shares of Siemens were mostly owned by individual family members. They had a qualified controlling stake, which declined in favor of banks and other companies in the 1920s.

Burhop (2011) states that investors had to be relatively rich because shares were expensive. The minimum face value of a share was 300 marks in the period of 1870 to 1884. Before the IPO, only 40 percent had to be paid. With offerings below par being prohibited, the minimum investment to buy one share was 120 marks. Stock market shares were therefore

still well within reach of the middle classes. In 1884, and with the introduction of the new corporate law, this changed, and the minimum face value of a share increased to 1,000 marks, and only fully paid shares were possible for an IPO. This was an extremely high minimum investment. Comparing this to the average annual wage of 1,300 marks of a German industrial worker in 1913 suggests that it was unlikely that workers or even middle-class employees held shares (calculations of the annual wage are based on Bry 1960).

All these studies use small sample sizes and provide only first impressions of investors' characteristics and investors' behavior in Germany in historical periods. Therefore, more detailed and comprehensive data about individual investors are necessary for the study of more specific questions about investors' characteristics and investment behaviors.

The following chapter introduces a database on individual investors in Germany in the period 1869 to 1955. It will help to provide a better picture about what we know about individual investors on German stock exchanges. To the best of the authors' knowledge, this is the first broad, systematic attempt to create an investors' database. The data on individual investors were hand-collected from the Hessian Economic Archive (Hessisches Wirtschaftsarchiv), the Bavarian Economic Archive (Bayerisches Wirtschaftsarchiv) and the Baden-Wuerttemberg Economic Archive (Baden-Württembergisches Wirtschaftsarchiv), as well as from the Historical Archive of Deutsche Bank AG, the Historical Archive of Commerzbank AG and the German Archive for Diaries (Deutsches Tagebucharchiv).[4] The data also provide an impression of the investment behavior (e.g. home bias) and how this changed over time (see chapter 4). Furthermore, it enables dealing with the investment behavior of a single investor (Joseph Frisch) and explaining his behavior during his lifecycle (see chapter 5). At least to some ex-

[4]For an overview and a description of the data and the signature, see overall Appendix.

tent, it relates to the question of why Germany had such a decentralized financial system with many stock exchanges and a banking system with many different branches (Klagge and Martin 2005).

In what follows, I divide each section according to the different archival sources. Within each section, I first give a general overview of the data. Thereby, the existing data in the research will be expanded and new archival records will be presented. Second, the strengths and weaknesses of the data will be discussed. In a third step, I show some descriptive patterns and give a first overview of who investors on German stock exchanges were during that time.

2.1 Shareholder Lists of Attendance[5]

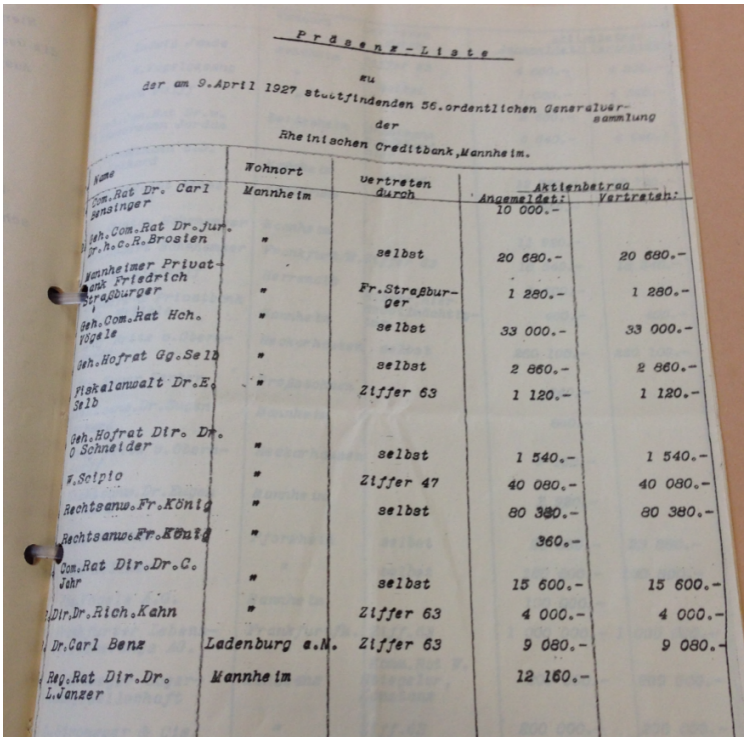
I systematically explored the available archival information, starting with shareholder lists of attendance from different companies. Companies had to submit information about their shareholders to the stock exchange operator of the stock exchange, including lists of shareholders attending the general assembly. The information had to be provided, for example, if the general assembly voted to increase or reduce equity or if the company listed new shares at the stock exchange. This became law under the Stock Exchange Act of 1896. Furthermore, companies disclosed their prospectuses, an extract of the register of commerce, the current company status and annual management reports.[6] After reviewing the archival material, I can state that even before 1896, a few companies already submitted their reports and records to the stock exchange operator. I have hand-collected data on individual investors from firms in the period from 1869 to 1945. Altogether, I collected 785 shareholder lists from 276 companies covering basic information on 10,017 individual investors (19,952 observation points in

[5] For a detailed analysis of the shareholder lists of attendance, see chapter 3 of this dissertation.

[6] Franks et al. (2006, pp. 539ff.) provide a review about the main legislative changes that occurred in German corporate law.

total). The information includes gender (male or female investor) and whether the investor was institutional (e.g. banks or industrial companies). I also extract information of the place of residence. For 4,175 investors, there is information on occupation and whether the investor owned a title. Figure 2.1 shows an example page of such an attendance list of the general assembly of the Rheinische Creditbank in 1927. This list is an example of a list that provides detailed information on investors. Unfortunately, having such a detailed list is not always the case (see the abstract of the shortcomings below). It states the names of the investors and gives information about their titles, occupations and the places of residence. Furthermore, it provides information about whether the investors were represented by e.g. a banker on the general assembly. Last, it lists the share capital owned by each investor.

However, these hand-collected databases of shareholder information have some shortcomings. First, the shareholder lists have different layouts and therefore are often incomplete. This limits the number of usable information. Often there is no information on occupation (as stated, in 4,175 cases, there is such information; in 5842 cases, there is no information) or share capital of the shareholder and only the name and the residence is reported. Second, the data cover only investors attending the meetings or general assemblies. Those investors who did not attend the assemblies remain unknown. Many investors are represented in these meetings by e.g. banks, or bank directors, so there is only information about the authorized representative, but not about the represented investors (see, for instance, also Burhop 2006,



Präsenz-Liste

zu

der am 9. April 1927 stattfindenden 56. ordentlichen Generalversammlung

der

Rheinischen Creditbank, Mannheim.

Name	Wohnort	vertreten durch	Aktienbetrag Angemeldet:	Aktienbetrag Vertreten:
Com.Rat Dr. Carl Bensinger	Mannheim		10 000.-	
Geh.Com.Rat Dr.jur. Dr.h.c.R.Brosien	"	selbst	20 680.-	20 680.-
Mannheimer Privatbank Friedrich Straßburger	"	Fr.Straßburger	1 280.-	1 280.-
Geh.Com.Rat Hch. Vögele	"	selbst	33 000.-	33 000.-
Geh.Hofrat Gg.Selb	"	selbst	2 860.-	2 860.-
Fiskalanwalt Dr.E. Selb	"	Ziffer 63	1 120.-	1 120.-
Geh.Hofrat Dir. Dr. O Schneider	"	selbst	1 540.-	1 540.-
F.Scipio	"	Ziffer 47	40 080.-	40 080.-
Rechtsanw.Fr.König	"	selbst	80 380.-	80 380.-
Rechtsanw.Fr.König	"		360.-	
Com.Rat Dir.Dr.C. Jahr	"	selbst	15 600.-	15 600.-
Dir.Dr.Rich.Kahn	"	Ziffer 63	4 000.-	4 000.-
Dr.Carl Benz	Ladenburg a.N.	Ziffer 63	9 080.-	9 080.-
Reg.Rat Dir.Dr. L.Wenzer	Mannheim		12 160.-	

Source. Historical Archive of Deutsche Bank AG, archive collections S4020.

Figure 2.1: Attendance List of the Rheinische Creditbank (General Assembly of April 9, 1927)

p. 14.). Data exist about how many votes are cast, but not about how the votes were exercised. Being aware of these shortcomings, I remove missing values from the dataset. However, since it observes the characteristics of investors who attended the general meeting, one can observe those that possibly influenced the company's fate. On average, 60 percent of the share capital was present at these meetings (see Table 2.1).

Table 2.1 shows some sample characteristics of the collected data per period: the number of companies, the number of general assemblies and the number of investors for six time periods in which the general assembly took place. The years from 1869 to 1913 cover the period of the

German Empire, 1914 to 1918 covers World War I, and 1919 to 1923 covers the first years of the Weimar Republic, which resulted in the hyperinflation of 1923. The period from 1924 to 1928 covers the prosperous period of the Weimar Republic, which then ended with the Great Depression of 1929 to 1933. The last period reflects upon the dictatorship of Adolf Hitler and World War II. Since trading became restricted under the Nazi regime, World War II is not treated separately.

Table 2.1: Distribution of Shareholders per Period

Panel: Distribution by period				
Decade	Number of companies	Number of general assemblies (GAs)	Number of investors	Average share of present capital
1869–1913	44	112	1,858	36.51
1914–1918	16	27	340	53.03
1919–1923	139	277	3,127	51.15
1924–1928	103	152	3,360	70.76
1929–1933	85	144	1,958	71.03
1934–1945	39	73	804	64.85
Total	276	785	10,017	59.75

Source. Various; please see overall Appendix. See also chapter 3 for a more detailed description.

In the first period, there are 112 general assemblies of 44 firms with 1,858 attending investors. This number drops in the second period, rises in the period of the 1920s and then drops again in the period of the Nazi party to 804 investors attending 73 general assemblies of 39 firms. Since these are attendance lists, it is also important to know how much of the share capital was present at such meetings. Altogether, about 60 percent of the share capital was present at the meetings. These numbers also vary over the different periods, being lowest (36.51 percent) in the period of the German Empire and highest (71.03 percent) from 1919 to 1933.

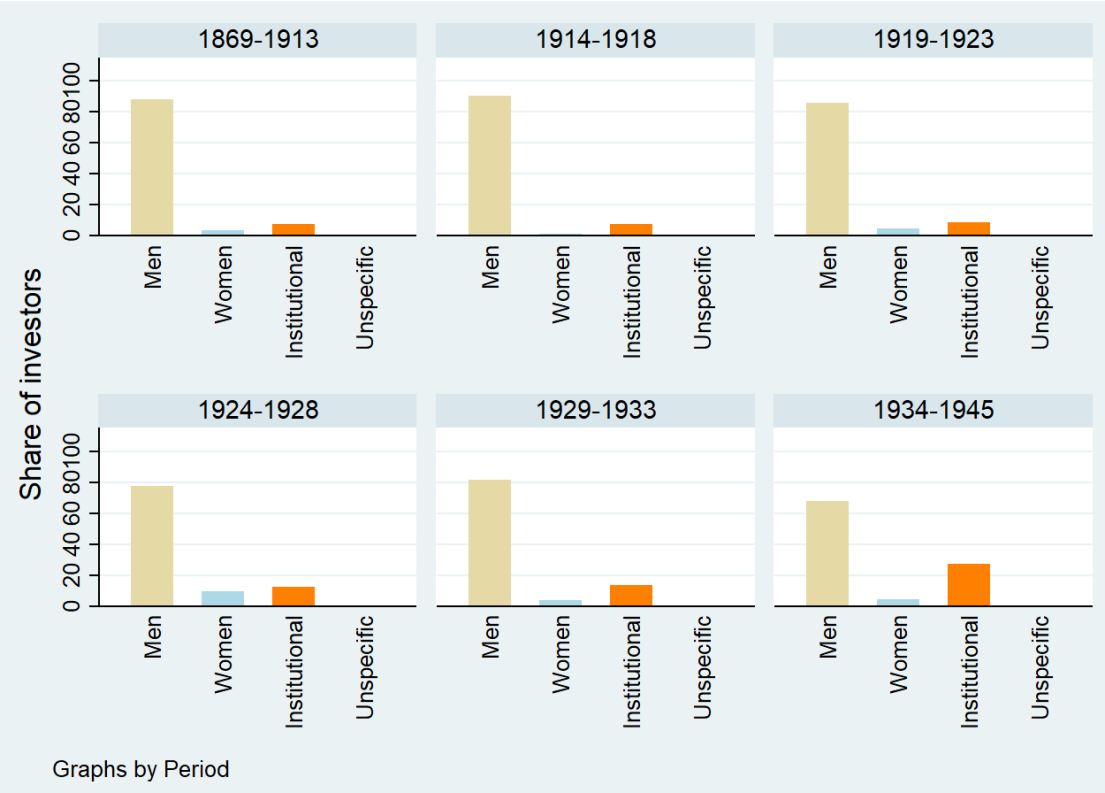
Figure 2.2 shows the distribution of male, female and institutional investors (defined by

the names on the lists) for the different time periods. If the investor was a representative of a community of heirs, that is summarized in the category "unspecific." The first descriptive pattern is that most of the investors who attended the meetings were men. In the first period, the share of male investors was at 87.9 percent, rising to 90.2 percent in the period of the First World War, but then falling to 67.9 percent in the period of the Nazi reign. The share of women is 3.6 percent in the first period, dropping to 1.5 percent and rising then to about 9.8 percent in the period 1924 to 1928. The share of women then falls again to 4.2 percent in the last period. Regarding the institutional investors who attended the meetings, one sees a rise from 7.5 percent to 27.5 percent. Looking at them in more detail, institutional investors came mainly from the banking sector (70.2 percent). About 7 percent of the institutional investors came from heavy and light industry.[7] The heavy industry category contains engineering firms, metalworking and railway requirements, whereas, light industry includes firms from the textile sector, paper industry, glass industry and rubber industry. About 25 percent of the institutional investors were hotel companies, terrain companies and mortgage banks.

Figure 2.3 shows the classification of the investors into social classes depending on occupation and academic title following Schüren (1989).[8] The classification includes four social classes: the upper class (1), the higher middle class (2), the lower middle class (3) and the working class (4). The upper class contains landowners, large manufacturers, academics and upper senior officials. The higher class consists of full-time farmers, medium-sized entrepreneurs, senior civil servants and top officials. Small farmers, merchants, masters and hosts, middle civil servants and employees are categorized in the lower middle class.

[7]For the classification of the industrial sectors, see Lehmann-Hasemeyer and Opitz (2019, p. 79.). The Appendix of chapter 3 provides an overview of the classification into different sectors.

[8]For a further description of the classification scheme of Schüren (1989), see chapter 3 of this dissertation. It also provides an argument for why I choose this classification scheme.

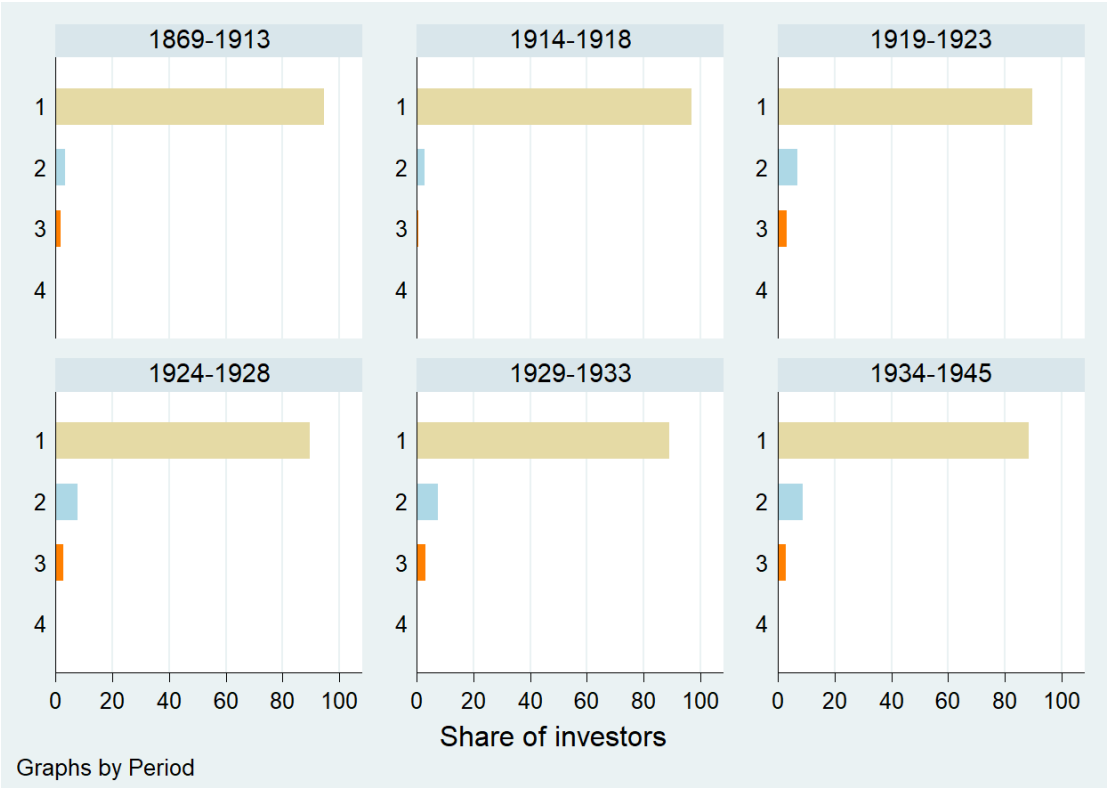


Source. Various; please see overall Appendix. See also chapter 3 for a more detailed description.

Figure 2.2: Distribution of Male, Female and Institutional Investors

Finally, the working class includes skilled workers, craftsman, skilled industrial workers, lower civil servants and employees. Figure 2.3 shows that at the end of the 19th century and in the beginning of the 20th century, most shares were owned by the upper class, which accounted for about 90 percent of the investors. This was especially the case in the period of the German Empire, up to the First World War. This changed with the beginning of the Golden Twenties in the Weimar Republic, when more people from the middle class and the working class owned shares. The share of investors from the upper class dropped to under

90 percent and constantly fell to about 88.4 percent in the last period. In comparison, the share of investors from the middle class (higher and lower middle class) drops in the second period (from 5.28 to 3.3 percent), but then rises to 11.55 in the sixth period.



Notes. 1: upper class, 2: higher middle class, 3: lower middle class, 4: working class.

Source. Various; please see overall Appendix. For the classification into social classes, see Schüren (1989). See also chapter 3 for a more detailed description.

Figure 2.3: Distribution of Investors per Social Classes

The share of the working class is very low, and only in the third and fifth periods it is higher than 0 (0.07 percent, and 0.22 percent).

Another interesting point that has not been considered yet is how many of the investors

came from foreign countries. Table 2.2 shows the descriptive statistics. According to panel A, in total, 219 investors from the hand-collected sample came from foreign countries, of which 64 percent were male, 7 percent female and 27 institutional investors. About 2 percent belong to the unspecified category. Looking closer at the male investors, for 58 of them, data are available for occupation. Using again the classification of Schüren (1989), it turns out that all of the investors belonged to the upper class. For the female investors, there is no further information on occupation or marital status. Regarding the institutional investors, 50 percent belonged to the banking sector and were mostly local banks, such as e.g. the Schweizerische Basler Handelsbank in Basel. Moreover, institutional investors were local companies from the heavy and light industries and from the food processing and transportation sector. Panel B reports the origin of the investors. Here, 37.4 percent of the investors came from Switzerland and 23.2 from Austria. About 10 percent of the investors came from the Netherlands. A smaller share (from 3.6 to 5 percent) came from Great Britain, Belgium, Czechoslovakia, Poland and France. About 25 percent of the investors were represented at the general meetings by representatives. However, if one takes a closer look at the names of the investors, one will notice that they mainly had German names. Comparing the foreign investors with foreign firms listed at German stock exchanges, the fact that many of the investors came from Switzerland and Austria is not surprising. For example, in 1913, 32 firms from Austria-Hungary and three firms from Switzerland were listed on German stock exchanges (Burhop and Lehmann-Hasemeyer 2016, p. 439). A further question that arises is in which companies the foreign investors invested. Regarding this, they mostly invested in firms that were listed at the Berlin stock exchange, but many were listed at several regional stock exchanges. A clear pattern cannot be recognized. Moreover, one can affirm that about 15.6 percent of the foreign investors

lived within 50 kilometers to the headquarters of the company. Using the 100 kilometer radius within the headquarters, about 17.4 percent of the foreign investors were located at the companies' headquarters. This indicates that these investors lived close to the German state border. About 82.6 percent lived more than 100 kilometers from the companies.

Table 2.2: Foreign Investors at German Stock Exchanges

Panel A: Investors in percent		
Male		64
Female		7
Institutional		27
Unspecified		2
Total		100
Panel B: Origin of foreign investors		
Country	N	In percent
Switzerland	82	37.44
Austria	51	23.29
Netherlands	21	9.59
Great Britain	11	5.02
Belgium	9	4.11
Czechoslova	9	4.11
Poland	8	3.65
France	8	3.65
U.S.	5	2.28
Luxembourg	4	1.83
Italy	4	1.83
Chile	2	0.91
Denmark	1	0.46
Serbia	1	0.46
Romania	1	0.46
Turkey	1	0.46
Free state Gdansk	1	0.46
Total	219	100

Source. Various; please see overall Appendix.

2.2 Shareholder Books

Apart from the attendance lists of general assemblies, shareholder books of companies can be used. The advantage of these shareholder books is that the information is now independent of investors attending general assemblies, and there is no selection bias regarding this problem. However, searching for these shareholder books in the archives is difficult, since there are not many of these shareholder books. Most of these registers have not been returned by the companies. Those that can be found in the archives are in most cases incomplete and do not contain the complete shareholder structure of the company. In all the cases, the name as well as the place of residence of the shareholder is registered. In some cases, the share capital and the value of the shares held are also provided, while in other books, the capital is missing completely and only the name of the shareholder is available. It is sometimes not clear which exact date the shareholder book covers and when the individual shares were bought or traded. The books also do not provide information on how long the shares were held. Therefore, it seems that the books only give information for a specific point in time, not for a certain period of time.

Nevertheless, the shareholder books are used despite possible shortcomings, since the information still largely contributes to our knowledge of who held shares in the observation period.

Next, I describe the contents of three shareholder books: the shareholder book of the Metallgesellschaft AG[9] in 1919, the shareholder book of the Metallbank und Metallurgische Gesellschaft AG[10] from 1919 to 1953 and the shareholder book of the Mittelschwäbische Über-

[9]Source: Hessian Economic Archive (Hessisches Wirtschaftsarchiv, HWA). Shareholder book of the Metallgesellschaft AG, Frankfurt am Main, 1919. Archive collections HWA 119/392 (hereafter HWA 119/392).

[10]Source: Hessian Economic Archive (Hessisches Wirtschaftsarchiv, HWA). Shareholder book of the Met-

landzentrale Giengen AG[11] in 1925.

This small sample of shareholder books is not representative since the books only cover investors of three different firms.[12] Furthermore, the three firms are very specific. The Metallgesellschaft AG and the Metallbank und Metallurgische Gesellschaft AG were heavily involved in the international metal markets at the end of the 19th century and the first half of the 20th century. They controlled a significant portion of the global metal market and had numerous investment companies and subsidiaries in all major industrialized countries. In contrast, the Mittelschwäbische Überlandzentrale AG was a regional company that supplied the surrounding areas and communities with electricity.

2.2.1 Shareholder Book of the Metallgesellschaft AG in 1919

The shareholder book of the Metallgesellschaft AG (hereafter referred to as MG) covers the year 1919, according to information of the archive. It includes data on 153 individual investors, of which 71 percent are male investors, 25 percent female investors and 4 percent institutional investors (Figure 2.4).

The year of the shareholder book has to be challenged since there are some investors listed who died in the early years of the first decade of the 20th century. For example, Leo Ellinger, who was co-founder of the MG and started to work for the MG in 1869, had been a member of the supervisory board of the MG since 1881. Later, he became a member of the supervisory

allbank und Metallurgische Gesellschaft AG, Frankfurt am Main, 1925-1953. Archive collections HWA 119/393 (hereafter HWA 119/393).

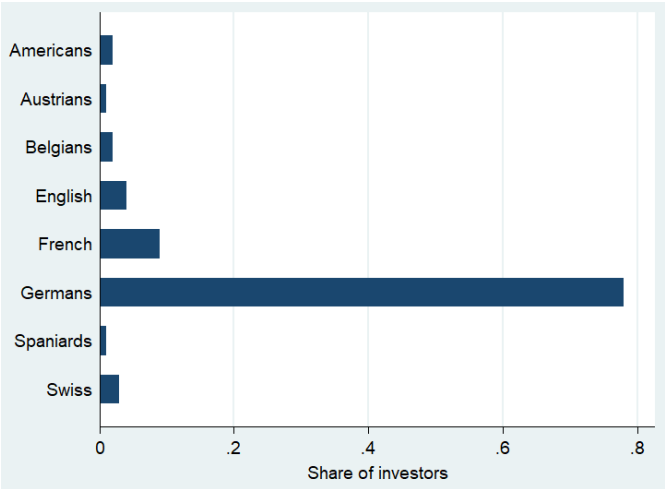
[11] Source: Baden-Wuerttemberg Economic Archive (Wirtschaftsarchiv Baden-Württemberg, WABW). Shareholder book of the Überlandzentrale Giengen AG, Giengen an der Brenz, 1925. Archive collections WABW B2007/649 (hereafter WABW B2007/649).

[12] In more detail, the books only cover two firms since the Metallbank und Metallurgische Gesellschaft AG belongs to the overall group of the Metallgesellschaft AG.

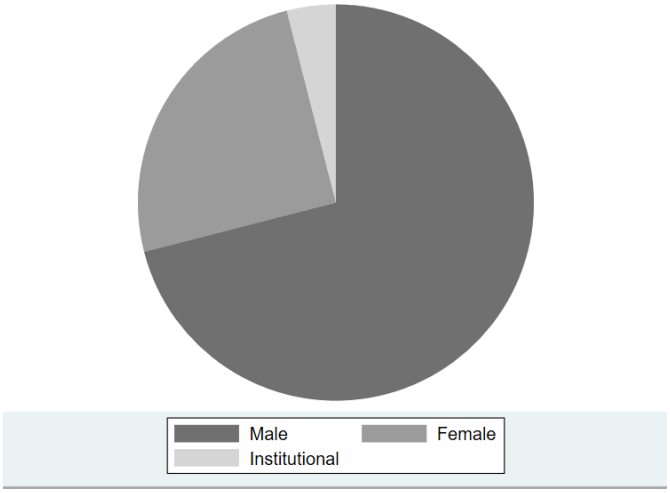
board of the Metallurgische Gesellschaft and of the Metallbank. He died in 1916 (Däbritz 1931). Further examples are Dr. Carl Hamburger and Professor Curt Netto. Hamburger was member of the supervisory board of the MG since 1881 and died in 1912 (Däbritz 1931 and Knetsch 1998). Netto was between 1897 and 1903 member of the board of the MG and between 1903 and 1909 member of the supervisory board of the Metallurgische Gesellschaft AG, which also belonged to the group of the MG. He died in 1909 (Däbritz 1931 and Knetsch 1998).

In the book itself, one cannot find information about the year. However, it seems that the book covers the years around 1900 and not 1919. Furthermore, it turns out that the shareholder book is a register that also contains information on shares of affiliated companies, subsidiaries or supporting banks of the MG.[13] This is particularly obvious for the institutional investors. They all come from the group of the MG itself, like e.g. the Schweizerische Gesellschaft für Metallwerte in Basel, the Metallbank in Frankfurt/Main that held also shares of the MG or the private banks Metzler and Grunelius, which financed the businesses of the MG (Knetsch 1998). It seems that the shareholder book also contains close friends of the MG or locals from Frankfurt/Main. For example, the family "Mumm von Schwarzenstein" in Frankfurt/Main owned shares, as did the family of "Ladenburg"—which Wilhelm Merton married into—owned shares. Also the members of the founding families (Merton and Ellinger) owned shares. Moreover, the share register lists MG employees and their relatives and members of the management board and the supervisory board. This might be a fitting description since it has also to be noted that the MG issued until 1922 only registered shares (Namensaktien), which were not traded on the stock market. In MG's early years, most shares

[13] The overall Appendix provides biographical information about the investors listed in the shareholder book.



(a) Origin of Investors (in Percent)



(b) Share of Male, Female and Institutional Investors (in Percent)

Source. Own calculations using HWA 119/392.

Figure 2.4: Origin of Investors (in Percent) and Share of Male, Female and Institutional Investors (in Percent)

were in the hand of the founding family and in the MG group itself (Reichel 2008, p. 28).

This changed in the years after the First World War as more and more registered shares began to circulate on the stock market (Ibid., p. 55).

Moreover, Figure 2.4 shows the origin of the investors in percent. About 78 percent are German investors. The second group with 9 percent comes from France. Furthermore, investors come from Great Britain, Switzerland, the U.S., Belgium, Spain and Austria. If one looks at the origins of the shareholders, it is noticeable that the investors all come from regions in which the MG was doing business. This is not surprising, since the shareholder book lists the members of the founding families, subsidiaries, industrial holdings, employees and close relatives and financial supporters of the MG.[14]

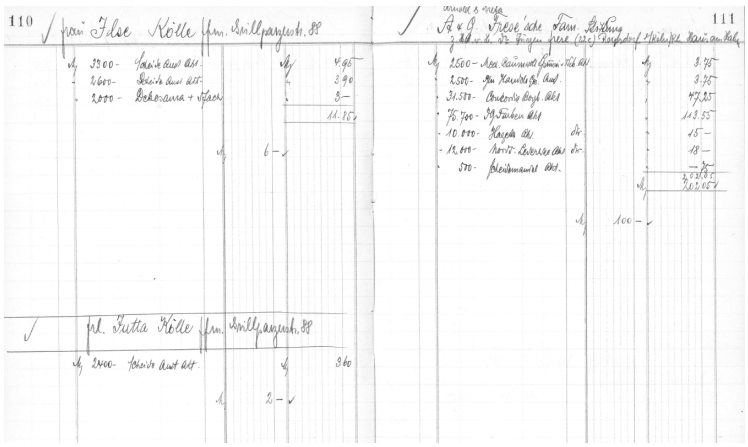
In 23 cases, information is available about the occupation of the investors. All 23 investors are academics and managers at the MG and therefore belong to the upper class.

2.2.2 Shareholder Book of the Metallbank und Metallurgische Gesellschaft AG From 1919 to 1953

The shareholder book of the Metallbank und Metallurgische Gesellschaft AG (hereafter referred to as Metallbank) is so far a unique source because it consists data of the investors listed with his/her or its name, full address and investment portfolio. Figure 2.5 shows the sample page of the shareholder book. It consists of two parts and covers the period from 1919 to 1953, according to archive information. For the analysis, only the first part is used, since the second part of the years around 1953 contains only the names of investors, without any information on address and investment portfolio. However, the period starting in 1919 should be questioned. First, there is no indication of the date. The year 1919 does not seem right because

[14] For a detailed overview of subsidiaries and industrial holdings of the MG, see overall Appendix.

one often finds stocks of the IG Farben AG in the portfolios. The IG Farben AG, based in Frankfurt/Main, was founded at the end of 1925 as a result of the merger of eight German companies in the chemical industry (see e.g. Bayer-Gefahren e.V. 1995). This indicates that the shareholder book covers the years after 1925. But nevertheless, it is not clear, since there are no annual dates and no information on share purchases or stock sales. It is not possible to determine whether the book covers a period of time or only one point in time.



Source. Shareholder book of the Metallbank und Metallurgische Gesellschaft AG, pages 110 and 111 (around 1925); HWA 119/393.

Figure 2.5: Sample Page of the Shareholder Book

The shareholder book includes portfolios of 55 male and 44 female individual investors. Moreover, there is information about 27 portfolios of institutional investors. The information on the portfolio consists of the name, title and occupation of every investor, his/her or its city of residence, the value of the share and different types of the securities in the portfolio. There is also information on the name of the stock. From this, I can deduce the name of the company, the headquarters of the company, the share capital of the company, the size in the

portfolio and the different stock exchanges on which the stocks were listed.

However, some issues need to be addressed. First, I need to clarify whether the persons in the book are customers of the Metallbank or not, as it was not a classical bank, where everyone could open an account.

According to archive information, only employees of the group of the MG could open an account. Therefore, it seems that this shareholder book mostly contains portfolio information of the employees of the group of the MG. The possibility is also high that participating companies and friends of employees could have owned an account. To confirm this hypothesis, I look at further archival files like e.g. the register of employees of the MG. Many of the names in the employees register and in the shareholder book match. However, it remains unclear who opened the account and who bought the shares. The probability is high that the Metallbank compensated its employees for their work with shares and therefore opened accounts for them. A further analysis of the characteristics of the employees is discussed below in more detail.[15] The second question is what the exact statements of the value of the share and the courses of the shares mean. I check the courses in the Handbuch der deutschen Aktiengesellschaften and in the Berliner Börsenzeitung. Since I am not sure whether the courses in the shareholder book are correct, I do not consider the possible course of the stock for further analysis. Therefore, I only use the information about the residence of the investors, the location of the headquarters and the information of the securities for the analysis.

Table 2.3 shows the regional distribution of the investors, from whom there are data on the place of residence. In total, 85 investors come from Prussia. Table 2.3 also shows that most of them come from Germany (104 in total). Some foreign investors also own shares. However,

[15] See also Appendix of chapter 2, which provides more biographical information on the investors.

if one looks at the names, it seems that they have German origins. Looking at the foreign places in more detail, it is obvious that they come from places where the MG has industrial holdings and subsidiaries,[16] for example, in Great Britain (British Metal Corporation), the U.S. (American Metal Company), Switzerland (Schweizerische Gesellschaft für Metallwerte), South Africa (African Metal Company).

Table 2.3: Regional Distribution of the Investors

Place of residence	Men	Women	Institutions	Total
Prussia	32	31	22	85
Baden	3	1	0	4
Bavaria	2	2	0	4
Wuerttemberg	1	1	1	3
Bremen	0	0	2	2
Hamburg	1	1	1	3
Hesse	0	2	0	2
Thuringia	1	0	0	1
Germany	40	38	26	104
England	6	0	0	6
France	1	2	0	3
USA	2	0	0	2
Switzerland	1	1	0	2
Spain	1	0	0	1
South Africa	1	0	0	1
Netherlands	0	0	1	1
Luxembourg	0	1	0	1
Italy	1	0	0	1
Belgium	1	0	0	1
Australia	1	0	0	1
Foreigners	15	4	1	20

Source. Own illustration using HWA 119/393.

[16] For a detailed description of the industrial holdings and subsidiaries, see Appendix of chapter 4.

This again refers to the fact that the investors are employees or industrial involvements/partners as well as subsidiaries of the MG, so that the probability is higher that they are located near to the respective headquarters.

Although the focus is on stocks, Table 2.4 highlights that the data are more complex than that, since in total, I observe 1,017 securities that include stocks, obligations, bonds, covered bonds, treasury bonds and debt securities.

Table 2.4: Portfolios of the Metallbank und Metallurgische Gesellschaft AG in Numbers

Portfolio	Men	Women	Institutions	Total
Stocks	146	73	67	286
Obligations	52	54	85	191
Bonds	34	23	26	83
Covered Bonds	155	147	60	362
Treasury Bonds	17	16	24	57
Debt securities (of land banks)	18	7	13	38
Total	422	320	275	1,017

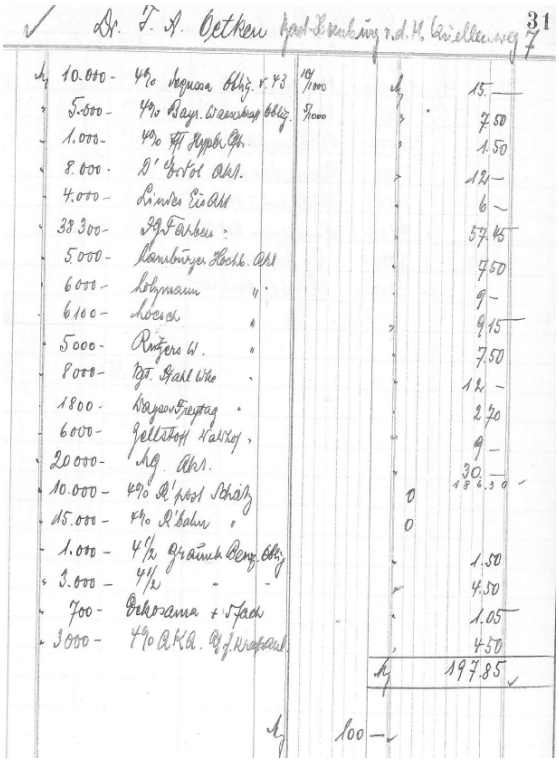
Source. Own illustration using HWA 119/393.

To get further confirmation of the hypothesis that mostly employees and subsidiaries of the MG appear in the shareholder book, I look at every single entry of investors in more detail and try to acquire data on their biographies.

Figure 2.6 shows a sample portfolio of Dr. Ing. F. A. Oetken,[17] which is taken from the shareholder book. It contains obligations, stocks, bonds and treasuries. Looking at the biographical information, Dr. Ing. F. A. Oetken joined the MG in 1920, and from 1922 onwards, he was an authorized representative at the Metalllurgische Gesellschaft AG (hereafter referred

[17] For a further description, see HWA 119/1772 and Däbritz (1931).

to as Lurgi), department "Heat." Later, he was responsible for all Lurgi companies. From 1937, he was a deputy board member of the MG (see HWA 119/1772 and Däbritz 1931).



Source. Shareholder book of the Metallbank und Metallurgische Gesellschaft AG, page 31 (around 1925), HWA 119/393.

Figure 2.6: More Portfolio Information (Dr. F. A. Oetken)

For further analysis of the investors in the shareholder book, see the Appendix of this chapter. It shows that mostly employees owned an account at the MG, which clearly aligns with the hypothesis that this shareholder book contains portfolio information about the employees and subsidiaries/industrial holdings of the group of the MG. The female investors were in many cases the wives of the male employees since the last names of male and female investors are identical. In some cases, the notation "Herr" was used in front of the name of the

female investor. For example, the wife of Alfred Petersen, who was an employee at the MG, was noted as "Herr Rosemarie Petersen." Behind some names in the book the annotations "Lurgi" and "im Hause" appear, which also suggests that these persons are employees at the group of the MG.

2.2.3 Shareholder Book of the Mittelschwäbische Überlandzentrale Giengen AG

The shareholder book[18] of the Mittelschwäbische Überlandzentrale Giengen AG (hereafter referred to as MÜAG) contains information about 1,319 individual investors, holding in total 2,500 shares at 100 Reichsmark (RM) and 3,500 shares at 20 RM, which means that overall shares in the value of 320,000 RM are noted. According to the Handbuch der deutschen Aktiengesellschaften (1925), the overall share capital of the firm was 1,280,000 RM, so the shareholder book contains information about 25 percent of the shareholders. Nothing is known about the other 75 percent of the shareholders of the firm. Furthermore, I extract the name and the gender (male/female/institutional) of every single shareholder. In 529 cases, there is also information about the title and the occupation of the investors. In addition, the city of residence is known.

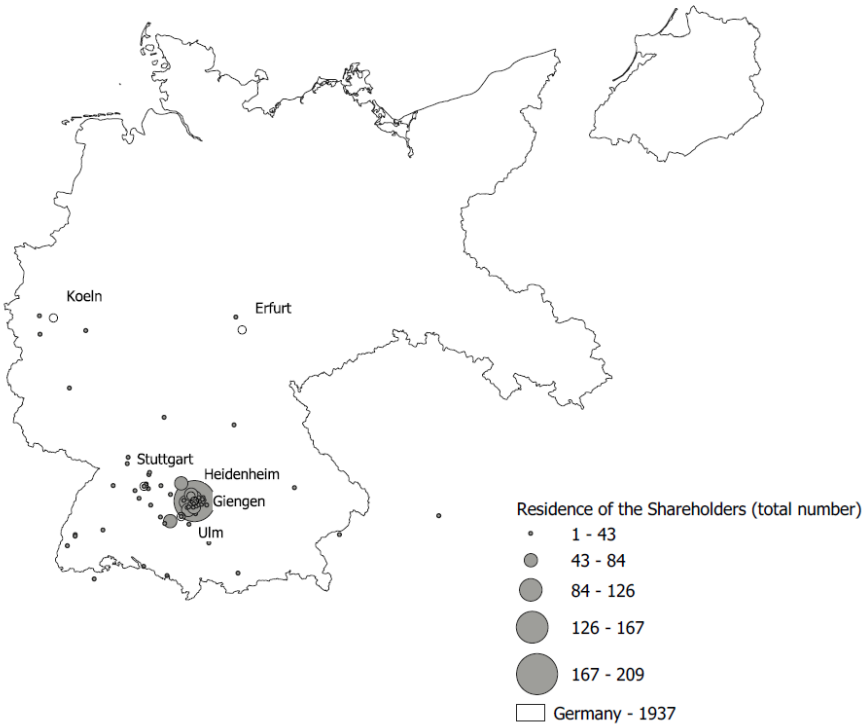
From the company data, I take the name of the company, the industrial sector, the location of the headquarters and the stock exchanges on which the company's shares were listed.

As Figure 2.7 shows, the majority of investors are within a very narrow radius of Giengen's head office of MÜAG. However, some investors are further away from Giengen. This part represents a very small portion of investors. Only 7.7 percent of the investors are not within

[18] Source: WABW B2007/649.

100 kilometers of the MÜAG.

Table 2.5 shows the descriptive statistics of the investors divided into gender and social classes. In total, the sample contains 1,319 investors for which we have information about gender. For 529 investors, there is also information on their occupation. Overall, we observe 108 female investors, 1,161 male investors and 50 institutional investors (Panel A).



Note. The map depicts the German Reich with the state borders of 1937.

Source. Own illustration, using WABW B2007/649.

Figure 2.7: Regional Distribution of the Investors

Looking closer at the institutional investors, mostly the surrounding communities and the regional industries were involved at the MÜAG. This is not surprising because the MÜAG

supplied the surrounding communities with electricity and the supply network in the region was constantly expanding (Überlandzentrale AG 1958).

Panel B shows the class affiliation of the individual shareholders. Above all, it can be seen that the main component of the shareholders lies between the working class (31.2 percent) and the higher middle class (24.4 percent). The largest share of shareholders came from the lower middle class (33.6 percent). The upper class accounted for only 7.2 percent, only a few shareholders. The most common occupations among shareholders are farmers, traders and craftsmen. Scholars are few, but four people have a doctoral degree. One shareholder is ennobled with a count's title.

Table 2.5: Gender and Social Classes 1925—Descriptive Statistics

Panel A: Totals and in percent (gender)			
Women	Men	Institutional investors	Total
108	1161	50	1,319
8,19	88,02	3,79	100

Panel B: Totals and in percent (social class)					
Upper class	Higher middle class	Lower middle class	Working class	Not assignable	Total
38	129	178	165	19	529
7.2	24.4	33.6	31.2	3.6	100

Source. Own calculations using WABW B2007/649.

Comparing the results with the numbers in Figure 2.3, it is somehow surprising since Figure 2.3 lists mostly shareholders from the upper class. Also, the shareholder structure of the MG was completely different because the MG also had supra-regional shareholders located in Europe or in the U.S. Nevertheless, this shows the regional character of the MÜAG, in

which the middle class was starting to hold shares. The MÜAG listed its shares on a regional stock exchange and had also a regional shareholder structure. This shows that many of the shareholders were locals and had middle-class jobs. Of course, one has to be careful with interpretation, because only 25 percent of the shareholder structure are listed in the book. Checking the names of the investors reveals that some of them were also employees of the MÜAG, e.g. the "Betriebsleiter" Wilhelm Bosch or the "Elektromonteur" Berthold Klein. The shares of both men were with 80 Reichsmark, only a fraction of the total share capital.

Since the MG and the MÜAG are only two companies and the information on investors is not complete, a generalization of the findings is not possible. The question of whether regional companies have a different investor structure compared to large companies is left open for further research.

2.3 Individual Portfolio of a Private Banker[19]

Another source for studying investment behavior at that time is portfolio data from individual investors. Intense archival research revealed that data of this type are very scarce. In many cases, portfolio data are available only for certain years or months and not for longer time periods. Furthermore, they are often incomplete and contain only selective information about investments in equities. Therefore, it is difficult to make comparisons between investors because often the period of observation does not match.

However, I hand-collected one unique dataset about historical investors from the Baden-Wuerttemberg Economic Archive. This source describes the individual portfolio of the private banker Joseph Frisch from Stuttgart. In the filings of the archive, the portfolio is de-

[19] For a detailed analysis of the portfolio, see chapter 5 of this dissertation.

scribed as Depotbuch des Bankhauses Joseph Frisch und des Bankhauses Joseph Frisch Nachfolger.[20]

The private banker Joseph Frisch was born in Gaggenau in Baden, in 1881. He married Emma Frisch (born Offermann) and had two daughters (Hesselschwerdt 2015, pp. Iff.).

In 1922, Joseph Frisch founded the private bank Joseph Frisch in Stuttgart. (Hohmann 2009, pp. 312f.). It was one of many new private banks that were founded in the early 1920s in Wuerttemberg and was one of few private banks to survive over many years (Bergner 1993, pp. 204ff.).

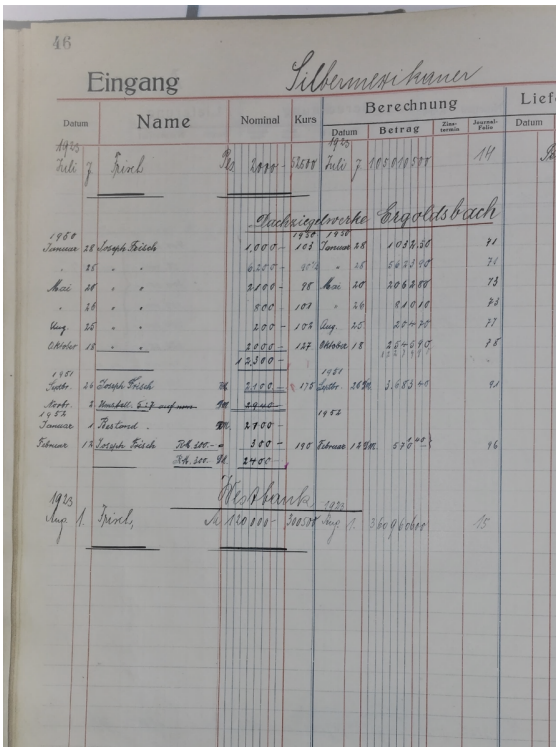
The bank profited very much from the liquidation of the Jewish banks and was ranked 22 in a list of important German private banks in 1938 (in 1933: rank 121) (Ziegler 2003, p. 44). Joseph Frisch died in April 1953, but the leadership of the bank remained in the hands of his widow and his two daughters. In 1955, the Kapitalverwaltungsgesellschaft Zavelstein took over the business activities and the name of the bank changed to Joseph Frisch Nachfolger. The bank then was dissolved in 1966 (Hohmann 2009; Heselschwerdt 2015).

Figure 2.8 shows a sample page of the portfolio of Joseph Frisch. The transactions are handwritten and sorted by asset. The portfolio covers the period from 1923 to 1955 and contains more than 6000 transactions of stocks, bonds, obligations and debt securities.

The portfolio lists the name of the stock, the nominal value, the price and sometimes the profit and the amount that was paid for the shares. Most of the transactions were carried out on behalf of Joseph Frisch, but there are some transactions for other parties, for example, the partner Otto Essele. The transactions took place from 1923 until Frisch's death in 1953. After

[20] Baden-Wuerttemberg Economic Archive (Wirtschaftsarchiv Baden-Württemberg, WABW). Depotbuch des Bankhauses Joseph Frisch und des Bankhauses Joseph Frisch Nachfolger, 1923-1957. Archive collection WABW B166/268 (hereafter WABW, B166/268).

his death, there are some further transactions that are carried out by a successor named Frisch Nachfolge. It remains unclear whether the portfolio is Joseph Frisch's private portfolio or a record of transactions by the bank, but since the bank and the person Joseph Frisch cannot be separated, this fact is not relevant. For the analysis, the focus is only on the transactions, because the prices and profits are not always available, which makes it difficult to calculate profits and losses.



Notes. For a further detailed description, see also chapter 5.

Source. WABW, B166/268, page 46.

Figure 2.8: Sample Page of the Portfolio of Joseph Frisch

Frisch traded not only with stocks, which can be seen in Table 2.6, but also with obliga-

tions, bonds and debt securities. Apart from stocks, these securities are only a small part of the portfolio.

Table 2.6: Portfolio of Joseph Frisch in Numbers

Portfolio 1923–1955	Total Transactions
Stocks	4592
Obligations	156
Bonds	495
Covered bonds	71
Treasury bonds	44
Debt securities (of land banks)	2

Source. Own calculations using WABW, B166/268.

2.4 Diary Entries of Investment Behavior of a Private Investor

Since portfolio data of investors for longer time periods are very scarce, finally, another opportunity to learn more about investors from the late 19th century is provided by a historical record on Gustav Schlott, which his great-grandson made available to the German Archive for Diaries (Deutsche Tagebucharchiv in Emmendingen).[21] Schlott's diary entries provide interesting insights into the investment behavior of an investor from the late 19th century and early 20th century. This dataset includes, among other things, three diaries in which he noted his investments in different securities over time. The first diary begins in 1878,[22] the second covers the period from 1884 to 1892 and the third diary dates from 1892 to 1926.

Gustav Schlott was born on 4 March 1852 in Hirschbach near Schleusingen and probably

[21] German Archive for Diaries (Deutsches Tagebucharchiv Emmendingen), DTA 3768, 1, 2, 3 (hereafter DTA 3768; 1, 2, 3). The numbers 1, 2 and 3 stand for the three diaries.

[22] From the data, it can only be seen that the first diary begins in 1878. It is incomprehensible which period of time it covers.

died in Braunschweig in 1925/26[23] (DTA 3768; 2). With his wife Johanne Schlott, he had four children, Johannes, Ludwig, Gretchen and Gertrud (Ibid., p. 8). He began his professional career in 1872 as an assistant teacher at the Weißenfelser Taubstummenanstalt with an initial salary of 200 thaler[24] and an apartment he received from the Taubstummenanstalt (Ibid. and DTA 3768; 3, p. 32). Due to his successfully completed training, his salary increased gradually to 1,800 marks. In 1879, he accepted a job offer from the institution in Braunschweig, with an annual salary of 2,700 marks. He successfully passed the Vorsteherprüfung für Taubstummenanstalten and was appointed in 1882 as the school inspector at the local institution. The job was associated with an initial salary of 3,300 marks, which was gradually raised until 1,900 to 4,800 marks (DTA 3768; 2, p. 8 and 15). In addition, he gave students private lessons to increase his income. As a school inspector, Schlott belonged to the upper class of society. This is also illustrated by a diary entry in which he mentions that acquaintances from his home village asked him for a loan (DTA 3768; 3, p. 17). Consequently, he has managed to grow out of the poverty of his parents and his hometown (DTA 3768; 2, p. 6). He was member of various clubs (Ibid.).[25]

In his diaries, Schlott noted his investments in varying degrees of detail. For example, in the first diary, he describes only the family's assets of July 1878, which includes cash reserves

[23] The diary records only mention that the third diary covers the period from 1892 to 1926. In addition, a note "half a year before his death" is included. Therefore, I assume that he probably died around 1926. He moved to Braunschweig in 1879 and reported only once about a move within Braunschweig. For this reason, I assume that he also died there.

[24] 1 thaler equals 3 marks. For the sake of comparability, all information from thaler to mark will be converted and given below.

[25] He was a member of the board of the Church of St. Katharinen, the Beamten-Konsum-Verein and the Brunonia Foundation. In addition, he worked in caring for the poor and was member of the Herbartkränzchen, the Leopoldstiftung and the Beamten-Kollegium der Loge Carl zu gekrönten Säule. His honorary offices illustrate his social involvement and social position. In addition, he published essays in schoolbooks and published the book "Illustrierte Biblische Geschichten," which expresses his Christian education and way of life.

and different types of securities. He writes in more detail about his investments in the second diary. In total, he made investments of 46,480 marks from 1884 to 1892. Half of the investments were in covered bonds, consols and private mortgages. From the last diary, which covers the period from 1892 to 1926, Schlott noted investments of 1,728.40 marks in covered bonds and consols, 800 marks in bank deposits and 53,000 marks in mortgages.

If one compares the investment activity of the different diaries, one notes that he invested relatively evenly between covered bonds/consols and mortgages and then shifted significantly in favor of mortgage lending. The capital used for mortgages was mainly given to small entrepreneurs. It is surprising that Schlott did not invest in any shares in the given time period.

Critically, not all entries were noted in detail. For example, the family received securities from an inheritance, but no further details are given on how many and which titles they include. In 1894, Schlott notes that some of the income is invested, but here too the amount and the titles invested in are missing. It is also unknown whether Schlott always wrote down all his transactions. As a result, it is not possible to fully understand the composition of his total portfolio over time. Furthermore, Schlott does not note his reasons for investing in different securities, which also limits the analysis.

Compared to the portfolio of Joseph Frisch, the portfolio of Gustav Schlott is not that detailed, and no statistical analysis could be performed, since only a small number of transactions is known. However, since I know the names of the securities, it is possible to analyze whether Schlott invested in regional securities or in those that were located further away.

3

The Persistence of Ownership Inequality-Investors on the German Stock Exchanges, 1869-1945*

Rising inequality is one of the most recognized and debated issues of our times, and

*This chapter is co-authored with Sibylle Lehmann-Hasemeyer (University of Hohenheim). The candidate's individual contribution focused mainly on the hand-collection and processing of the data and the literature research. The empirical analyis and the writing was split equally between the authors. An earlier version is published as working paper of the Priority Programme 1859 "Experience and Expectation Historical Foundations of Economic Behaviour" No. 8, October 2018 (Lehmann-Hasemeyer and Neumayer 2018a) and as Hohenheim Discussion Papers in Business, Economics and Social Sciences No. 20-2018 (Lehmann-Hasemeyer and Neumayer 2018b).

this debate tends to focus on income inequality (see, for instance, Piketty and Saez 2003 or Piketty 2015). Capital, however, was always more unequally distributed than labor in all countries and periods for which data is available. Piketty (2014, p. 244) gives some idea of the order of magnitude: The upper 10 percent of the labor income distribution generally receives 25–30 percent of total labor income, whereas the top 10 percent of the capital income distribution always owns more than 50 percent of all wealth, and in some societies, this is as much as 90 percent. While the bottom 50 percent of the wage distribution always receives a significant share of the labor income, the bottom 50 percent of the wealth distribution mostly owns nothing at all.

Yet, the interwar period saw great changes in wealth distribution: The capital/income ratio and the share of private capital as a percentage of the national income were higher before World War I than they are today (Piketty 2014, pp. 144–146). In the interwar period, both rates declined severely, and capital worth nearly a year and a half of national income was destroyed. The budgetary and political shocks of two wars proved far more destructive for capital than the actual combat. According to Piketty (2014, p. 148), the main factors explaining the fall in the capital/income ratio were the collapse of foreign portfolios, low savings rates, and the Great Depression, during which many stock- and bondholders were ruined as firm after firm went bankrupt. Moreover, low growth, repeated recessions, and the high inflation resulting in the hyperinflation of 1923 led many wealthy people to lose vast amounts of their assets even before the Great Depression unfolded.

However, it also brought about new opportunities for people from lower social classes because shares became cheaper in the interwar period. The ubiquitous characteristic of shareowners shortly before the outbreak of World War I was their wealth: Before 1884, the mini-

mum face value of a share was 300 marks – only 40 percent of which had to be paid before the IPO. With offerings below par being prohibited, the minimum investment to buy one share was thus 120 marks. Stock market shares were therefore still well within the reach of the middle classes. After 1884, however, the corporate law increased the minimum face value of a share to 1,000 marks, and an IPO was only possible for fully paid shares. Thus, the minimum investment increased by a factor of eight (Burhop 2011, p. 16). This can be compared to the average annual wage of a German industrial worker in 1913 of 1,300 marks (authors' calculation based on Bry 1960). Thus, it is unlikely that workers or even middle class employees held shares in this period. However, the post-war inflation dramatically changed access to stocks. The journalist Sebastian Haffner (2002, p. 56) describes in his memoirs that with hyperinflation and the fading away of savings, mortgages and other conservative investments, many people started to buy shares on the stock market. He describes how shares seemed to be an island of security able to maintain pace with inflation. He writes that low-level civil servants, ordinary employees and even shift workers became shareholders. The whole population was following the exchange reports. Stock market recommendations were exchanged in shops, factories and schools. However, Aron (1927) shows that although about 53 percent of capital of joint-stock companies were shifted among groups of investors, firms made sure that most shares were traded among large shareholders by granting them special conditions such as buying shares on account.

Thus, motivated by research on wealth inequality, we aim at contributing to this literature by extending the term 'inequality' to 'equality of opportunities' by studying capital ownership among different social groups in the period of 1869 to 1945. Therefore, we hand-collected a new dataset, covering all shareholder lists from general meetings available at the

archives of Deutsche Bank, Commerzbank, the Hessian Economic Archive, the Baden Wuerttemberg Economic Archive and the Bavarian Economic Archive. Altogether, we collected 785 shareholder lists from 276 companies, covering basic information for 10,017 individual investors. Especially after 1913, usually more than 50 percent of capital was represented at the meetings. Thus, although we only observe the characteristics of investors that attended the general meetings, we observe a substantial part of all investors and especially those that influenced the company's fate. Thus, our research also contributes to the literature on corporate governance.

Based on our unique dataset, we are able to show that while, in the German Empire, shares of joint-stock companies were only available to a small group of rich investors, after the hyperinflation of 1923, shares became more widely available to the middle class. Lower social classes, however, did not own shares in our observation period. Moreover, we are particularly interested in the gender perspective. Women's rights drastically improved in 1919. In the constitution of the first German democracy, women officially received equal rights, which is mostly reflected in the fact that they were now allowed to vote (Art. 109 Abs. 2 Weimar Constitution (Verfassung des Deutschen Reichs vom 11. August 1919)). However, the National Socialists again restricted these rights. After 1933, women were confined to the roles of mother and spouse and were excluded from all positions of responsibility, notably in the political and academic spheres. These developments are also reflected in the ownership structure. During the Weimar Republic, women had a much stronger representation at general meetings than before, but their overall ownership of shares remained low, and 98 percent of female investors that we observe were engaged in only a single firm. Overall, despite our observation of greater participation among women after 1919, their increased political power

was clearly not equally accompanied by a rise in economic power. It is also possible that the higher attendance of women at general meetings does not actually represent a larger share of capital ownership but rather the fact that women started to use their power by attending the meetings. This may be supported by our observation that, after 1919, we observe more women holding smaller numbers of shares.

To our knowledge, our work is the first that provides insights into investors' characteristics, such as their social class and gender, in the period of 1869 to 1945. While surveys provide good information about who holds and trades shares nowadays, very little is known about investors in earlier periods and how the composition of investors changed over time. Occasionally, we find published lists of applicants for shares – such as, for instance, the list of the first buyers of shares of Deutsche Bank (Pohl 1987 or Bol 2018b) or other selected samples (Fohlin 2007, pp. 120–124). Franks et al. (2006) provide the largest sample. They collected 156 lists of general meetings during the same period we cover, but they focus on ownership concentration and the share of founding-family ownerships. Burhop and Lehmann-Hasemeyer (2016) also provide some insights from lists of general meetings. They study the geography of German stock exchanges and show that there seemed to be a preference for local shares on regional stock exchanges. Neumayer (2018) also studies the home bias based on a selected sample, showing that the home bias disappears if a general meeting did not take place close to the headquarters of the firm. However, none of the research above studies investors' social characteristics.

Learning more about the shareholders is important not just in terms of inequality and social history, it is also interesting from a finance perspective. As Markowitz (1952) already pointed out in the 1950s, portfolio theory assumes that investors form expectations about returns and risks of securities, and they select portfolios according to their expectations and risk

preferences. In consequence, rational economic actors should diversify portfolios and trade very little. However, at least for modern periods, private investors have been shown to hold under-diversified portfolios (Goetzmann and Kumar 2008), to trade frequently (Odean 1998 or Barber and Odean 2000), to take on high idiosyncratic risk (Calvet et al. 2007), and to gamble (Kumar 2009). Clearly, socioeconomic characteristics matter a great deal here. Goetzmann and Kumar (2008) show, for instance, that the level of under-diversification of portfolios is greater among younger, low-income, less-educated, and less-sophisticated investors. Barber and Odeon (2011) show that men take higher risks than women, and younger investors take more risks than older ones. Studies testing reactions to historical events on stock markets can therefore only infer whose reactions they are actually testing.[1]

However, knowing who actually traded on the stock market, who influences decisions of joint-stock firms and how the composition of investors changed over time is crucial for the understanding of stock market development and determinants of the success and failure of firms.

3.1 Overview of Sources and Shortcomings of the Data[2]

Information on share ownership of investors is, in large parts, unavailable, because most of the shares were bearer shares (Burhop 2011, p. 15). Furthermore, there are also no complete shareholder records of firms, which we could use for our analysis. Therefore, we take another source of shareholder information into account using the fact that under the Stock Exchange

[1] To name a few, Lübbers (2008) and Kling (2006) study investor reaction to firm mergers in the 19th century and the interwar period, Lehmann-Hasemeyer et al. (2014) study how suffrage extensions to the working class affected stock market prices, and Opitz (2017) tests reactions to riots and wars.

[2] The following paragraph draws heavily on Neumayer (2018). For a detailed description and discussion of the data see chapter 2 of this dissertation. Furthermore, chapter 2 presents a broader review of the literature on historical investors in Germany.

Act of 1896, companies were legally bound to submit information about their shareholder structure to the respective stock exchange on which their shares were listed (Franks et al. 2006, pp. 542 and 554). Besides a company's prospectus, extracts from the register of commerce, the current company status and the annual management reports, lists of shareholders attending the general assembly had to be provided to the stock exchange operator of the respective stock exchange. For example, this was often the case if the general assembly voted to increase or reduce equity.

The data on individual firms were collected from the Hessian Economic Archive (Hessisches Wirtschaftsarchiv), the Bavarian Economic Archive (Bayerisches Wirtschaftsarchiv) and the Baden-Wuerttemberg Economic Archive (Baden-Württembergisches Wirtschaftsarchiv), as well as from the Historical Archive of Deutsche Bank AG and from the Historical Archive of Commerzbank AG.[3] The data includes filings of the Berlin, Hamburg, Cologne, Düsseldorf, Essen, Augsburg, Frankfurt, Munich, and Stuttgart stock exchanges. We extract the name of the company, the industrial sector, the location of the headquarters and the place where the general assembly took place. Data on the share capital of a company and the stock exchanges on which the company's shares were listed is from the Handbuch der deutschen Aktiengesellschaften. The Handbuch der deutschen Aktiengesellschaften only exists since 1896, but based on the included information, we are able to calculate the share capital for earlier periods for general meetings that took place before 1896. The information of the shareholder data includes gender or institution, name of every shareholder and his/her city of residence. In the vast majority of cases, however, these hand-collected databases of shareholder information are incomplete due to different protocols and layouts, which reduces the num-

[3] For an overview and a description of the data and the signature, see Appendix of chapter 3.

ber of usable observations depending on the requested information. In many cases, only the name and residence of the shareholders are reported, and furthermore, there is no information on occupation or branches of shareholders. In some cases, the address was left blank. For 4,175 shareholders, we also have information on title and occupation. For those observations, we classify the investors into social classes.[4] Data on the number of shares, the share capital of the investors and how many votes were cast are also taken from the shareholder attendance lists. In addition, we calculate the distance between a company's headquarters and the residences of every single shareholder to obtain a distance measure. Distances are calculated as straight lines.

Another bias in the data is that the information only covers investors attending the meetings or general assemblies. Those investors who did not attend the assemblies remain unknown. In addition, many investors are represented in these meetings and assemblies by, for example, banks or bank directors. In many cases, there is only information on the authorized representative, but not on the represented investors. There is also no data on how shareholders exercised their voting rights, only information on how many votes are cast. We do not use lists in which we observe too many outliers or missing values. Furthermore, the probability of investors attending such assemblies is higher for those who live in the same region in which the general assembly took place (see Neumayer 2018). However, since we observe the characteristics of investors that attended a general meeting, we observe those that actually influenced a company's fate.

Table 3.1 reports the number of companies, the number of general assemblies and the number of investors distributed into six time periods, where the economic conditions and/or the

[4] The classification into social classes follows Schüren (1989) and is discussed in more detail in section 3.3.

political system significantly changed. The period of 1869 to 1913 covers the meetings that took place during the German Empire, 1914 to 1918 covers the meetings during World War I, and 1919 to 1923 covers the meetings in the first years of the Weimar Republic, with high levels of inflation resulting in the hyperinflation of 1923. The period of 1924 to 1928 covers the meetings that took place during the middle period of the Weimar Republic, which was characterized by relative economic and political stability but ended with the Great Depression in the subsequent years of 1929 to 1933. Our last period covers the dictatorship of Adolf Hitler and World War II. We do not treat World War II separately, because trading became very restricted during the Nazi regime until 1945.

Table 3.1: Sample Characteristics - Distribution by Period

Decade	Number of companies	Number of general assemblies (GAs)	Number of investors	Average share of present capital
1869–1913	44	112	1,858	36.51
1914–1918	16	27	340	53.03
1919–1923	139	277	3,127	51.15
1924–1928	103	152	3,360	70.76
1929–1933	85	144	1,958	71.03
1934–1945	39	73	804	64.85
Total	276	785	10,017	59.75

Source. Various, please see Appendix of chapter 3.

Overall, our sample contains 276 companies with 10,017 investors attending 785 general assemblies. The number of meetings in our dataset varies with periods. In the first period, we observe 112 general assemblies of 44 firms with 1,858 investors. The number of general meetings drops in the period of World War I and rises to 103 firms, with information on 3,360 investors attending 152 general assemblies, in the period of the Golden Twenties. This num-

ber drops again after 1933 to 39 firms, with information on 804 investors and 73 general assemblies. Overall, about sixty percent of the share capital was represented at the meetings.

However, in the Empire years, the attendance was much lower than in the period of the Weimar Republic. This fits the observations by Fohlin (2007, pp. 122–124) and Franks et al. (2006). However, the attendance significantly increased during the Weimar Republic after 1923, when, on average, more than half of the capital was represented. Fohlin (2007, p. 124) also cites Richard Passow (1922), a contemporary observer, who lists some explanations for the low attendance rates at shareholder meetings. She summarizes his ideas as "rational apathy" among small shareholders: cost of travelling to locations where the meetings took place, insufficient time to attend, the sense that news coverage provided sufficient information for the small shareholders, and the presumption among small shareholders that their influence was limited. Passow (1922) also mentioned that women would not attend the meetings, since they were not believed to be able to handle them. Thus, the fact that more investors attended the meetings during the Weimar Republic could be driven by a higher concentration and therefore a lower share of smaller shareholders, cheaper transport costs, a greater desire for first-hand information and an increasing acceptance of female capital owners.

Table 3.2 provides information about the branches of the firms in our sample. The branches are divided into 10 categories: banking, insurance, mining, heavy industry, light industry, food processing, transportation, chemical industry, public utilities and diverse. Our sample consists mainly of banks, firms from the heavy and light industries, and breweries. The highest number of firms comes from the light-industrial sector. This category includes textiles, paper, glass and rubber.

Table 3.2: Sample Characteristics - Distribution of General Meetings by Industry

Industry	1869–1913	1914–1918	1919–1923	1924–1928	1929–1933	1934–1945
Banking	47	8	19	19	8	5
Insurance	0	0	5	6	0	1
Mining	4	2	12	3	7	3
Heavy Industry	2	2	29	11	19	17
Light Industry	23	8	93	36	53	29
Food Processing	23	3	47	11	13	6
Transportation	1	1	6	12	8	6
Chemical Industry	3	0	3	4	1	0
Public Utility	5	0	18	23	13	3
Diverse	4	3	45	26	22	3
Total	112	27	277	151	144	73

Notes. The heavy industry category contains: engineering firms, metal working, and railway requirements. Light industry contains: textile sector, paper industry, glass industry, and rubber industry. Food processing contains: breweries and mills. Public utility contains: electricity, and gas and water. Diverse contains: hotel companies, terrain companies, and mortgage banks.
Source. Various, please see Appendix of chapter 3.

Furthermore, there is a high number of hotel companies, terrain companies and mortgage banks in the sample.

Table 3.3 reports some further descriptive characteristics about the number of meetings we observe per firm. Overall, we observe, on average, 2.84 meetings per company over an average period of 4.19 years.

Table 3.3: Sample Characteristics - Descriptive Statistics

	Mean	SD	Median	Min	Max
Number of general meetings per company	2.84	3.31	2	1	24
Duration for which firms are included in the sample	4.19	6.42	1	0	35.06

Source. Various, please see Appendix of chapter 3.

To see whether our sample is representative or not, we compare it to the actual number of the listed firms per sector listed on the Berlin stock exchange in 1913, 1925 and 1938, as documented by the Handbuch der Deutschen Aktiengesellschaften, a stock market manual and Opitz (2018) (see Table 3.4 and Table 3.5 and Table 3.6). We calculate t-tests for the different firm characteristics (age, share capital, distance to the stock exchange) by industry and by time periods if we have more than 10 firms in our sample for the given time period and industry. If the mean difference between the pairwise variables for the respective panels (A1, A2, B1, B2 and C1, C2) is statistically significantly different from zero on one percent, we mark the column with a brighter grey shading. If the mean difference between the pairwise variables for the respective panels is statistically significantly different from zero on five percent, we mark the colum with a darker grey shading.

Starting with the period 1913 the table reveals that our sample is overall not representative for the firm characteristics firm age and distance to stock exchange. However, the total share capital of both samples are not statistically different. The t-tests of panel B reveal also that our sample is not representative in terms of share capital and distance to the stock exchange. The higher share capital in our sample is due to the hyperinflation in 1923. Leaving out the year 1923 still shows a higher share capital which is not representative compared to the sample of 1925. The t-test of panel C shows that our sample is representative for the firm characteristic share capital, but not for firm age and distance to the stock exchange. However, since we observe most of the important greater-sized companies our sample is valide and suitable to analyze.

Table 3.4: Firm Characteristics by Sector and Period (1913 vs. 1869-1918)

	Panel A1: Firm characteristics by sector 1913				Panel A2: Firm characteristics by sector 1869-1918			
Industry	Firm age in years	Joint stock capital in million M/RM	Distance to Berlin in km	Number of firms	Firm age in years	Joint stock capital in million M/RM	Distance to closest stock exchange in km	Number of firms
Banking	31.8	42	259	63	25.21	66	2	12
Insurance	53.5	6.3	207	49	0	0	0	0
Mining	32.5	17.8	321	103	18.36	4.4	0	4
Heavy Industry	20.9	5.1	252	178	23.42	9.1	79	3
Light Industry	24	3.5	267	123	23.08	3.7	78	11
Food Processing	25.2	2.8	255	86	17.62	1.7	74	10
Transportation	25.2	13	216	70	5.5	2.1	206	2
Chemical Industry	25.7	9.3	258	36	36.67	4.5	31	3
Public Utility	21.2	30.1	206	34	20.93	20	140	4
Diverse	22.7	6.9	185	133	10.81	5.7	0	6
Total	29.8	13.68	242	875	18.16	12.83	61	55

Notes. The distance of the companies which were also listed in Berlin is on average 403 km.
Source. Handbuch der Deutschen Aktiengesellschaften, Opitz (2018) and various, please see Appendix of chapter 3.

Table 3.5: Firm Characteristics by Sector and Period (1925 vs. 1919-1932)

	Panel B1: Firm characteristics by sector 1925				Panel B2: Firm characteristics by sector 1919-1932			
Industry	Firm age in years	Joint stock capital in million M/RM	Distance to Berlin in km	Number of firms	Firm age in years	Joint stock capital in million M/RM	Distance to closest stock exchange in km	Number of firms
Banking	47	16	186	51	52.3	200	32	19
Insurance	64.88	4.8	221	43	25.91	9.5	106	9
Mining	39.71	27	287	86	23.52	140	39	11
Heavy Industry	28.2	5.4	254	245	25.55	41	96	26
Light Industry	30.44	4.9	278	200	31.79	13	64	51
Food Processing	37.14	4	305	77	30.84	16	51	31
Transportation	37.88	13	217	67	23.82	17	48	13
Chemical Industry	32	17	244	53	33.71	15	71	7
Public Utility	27.63	21	214	63	21.25	43	38	22
Diverse	29.6	3.8	194	179	24.15	33	63	36
Total	37.45	11.69	240	1064	29.29	52.75	61	225

Notes. The distance of the companies which were also listed in Berlin is on average 271 km.
Source. Handbuch der Deutschen Aktiengesellschaften, Opitz (2018) and various, please see Appendix of chapter 3.

Table 3.6: Firm Characteristics by Sector and Period (1938 vs. 1933-1945)

	Panel C1: Firm characteristics by sector 1938				Panel C2: Firm characteristics by sector 1933-1945			
Industry	Firm age in years	Joint stock capital in million M/RM	Distance to Berlin in km	Number of firms	Firm age in years	Joint stock capital in million M/RM	Distance to closest stock exchange in km	Number of firms
Banking	58.94	24	265	50	47.25	51	106.14	2
Insurance	72.43	3.8	243	37	102	2	40.84	1
Mining	46.57	58	258	37	49.17	110	26.36	6
Heavy Industry	40.11	6.9	286	79	24	17	47.51	7
Light Industry	44.07	12	225	94	35.73	6.7	73.05	17
Food Processing	47.72	5.4	294	65	46.87	6.5	45.9	6
Transportation	52.32	32	238	50	39.95	13	55.65	6
Chemical Industry	43.06	333	191	31	0	0	0	0
Public Utility	40.77	37	264	26	38.33	23	0	4
Diverse	40	6.5	153	52	30.65	12	59.74	5
Total	48.6	21.86	242	521	41.4	24.12	45.52	54

Notes. The distance of the companies which were also listed in Berlin is on average 335 km.
Source. Handbuch der Deutschen Aktiengesellschaften, Opitz (2018) and various, please see Appendix of chapter 3.

3.2 Concentration

In this section, we examine the concentration of ownership. There are only few studies on ownership and control in historical perspective. For Germany, the pioneering study is from Franks et al. (2006), which analyzes the ownership structure of 55 companies based on 156 shareholder lists and finds that ownership concentration was quite high and even increased slightly over time. Their findings are in strong contrast to the UK. Acheson et al. (2015) analyze corporate ownership in their comprehensive historical study for the second half of the 19th century in the UK, and they find evidence that, first, ownership tends to disperse over time and that firms headquartered in London and with shares listed at multiple stock exchanges had more widely dispersed ownerships. Second, generally, ownership concentration was lower in the Victorian Britain of 1900 than in modern Britain. Foreman-Peck and Hannah (2012) study the divorce of ownership and control in pre-World War I Britain. They look at the ownership structure of 337 listed companies and found evidence of a divorce of ownership and control. Manager-owners and board members controlled little capital and few votes.[5]

Table 3.7 shows the descriptive statistics of our sample. In contrast to Franks et al. (2006), our values do seem particularly stable over time. Before 1913, the mean number of shareholders was 26.6. This falls to 18.3 for the meetings during World War I, rising again in the period after the hyperinflation and before the Great Depression, before dropping to about 18 under the Nazi reign. However, the median do not change much over time, remaining between

[5]Further studies by Franks et al. (2009) and Hannah (2007) also deal with the development of the ownership structure of British companies over time. For US corporations, there is still debate regarding the extent to which ownership and control were separated (for a review, see Cheffins and Banks 2009). Moreover, several studies analyze ownership and control for the US in more detail (see, for instance, Hilt 2008 or Holderness et al. 1999).

10 and 20 over the whole period, which is equal to Franks et al.'s (2006) calculations. Similar to Franks et al. (2006), the maximum number of investors is mostly above 100, showing that the method is perfectly capable of identifying large numbers of shareholders. The largest number of shareholders appears at the 1932 general meeting of Mannesmannröhren-Werke, a large steel producer headquartered in Berlin and with a share capital of 6 million Reichsmark. At this meeting, 582 investors were present, representing 46 percent of the company's share capital.

Table 3.7: Number of Shareholders Attending the Meetings

Decade	Mean	Median	Min	Max	Percent of capital present	Number of general meetings
1869–1913	26.6	20	2	248	36.51	112
1914–1917	18.3	13	2	153	53.03	27
1918–1922	17.3	12	2	249	51.15	277
1923–1928	29.3	13	2	582	70.76	152
1929–1933	20.3	10	2	282	71.03	144
1934–1945	17.9	10	2	97	64.85	73
Total	21.6	13	2	582	59.75	785

Note. This table reports the number of shareholders in the sample.
Source. Various, please see Appendix of chapter 3.

In Table 3.8, we report different measures of ownership concentration. We use the same measures as Franks et al. (2006) in their seminal article. These are C1, C3, and C5 – the combined votes of the largest, the three largest, and the five largest shareholders, respectively. Cthreshold is defined as the minimum number of shareholders necessary to cast 25 percent of the present votes, and Herfindahl is the overall distribution of represented capital/votes cast. For a better comparison with the findings of Franks et al. (2006), we include their calculations (Panel C) and our calculations grouped into the similar periods (Panel B). Similar

to Franks et al. (2006), we find no reduction of concentration over time. Indeed, if anything, concentration seems to slightly increase. On average, the largest shareholder held about 47 percent of shares, which means that, in most cases, this investor alone could provide more than 25 percent of the votes. The Herfindahl index also increases from 32 to 35 during the Weimar Republic. Overall, however, we find a much lower rise than Franks et al. (2006), but higher overall values. The average Herfindahl calculated by Franks et al. (2006) ranges between 23 and 29 in the period 1900–1920, whereas we measure average levels of 33.5 percent. Given that the median number of investors is fairly stable, the fact that more capital was represented at the shareholder meetings rather reflects the rising concentration in the form of rising shares of the attending investors, not a rise in the number of smaller shareholders attending the meetings.

Table 3.9 shows the percentage of shareholdings of inside shareholders. Inside shareholders are classified as members of the management board (Vorstand) and the supervisory board (Aufsichtsrat) as well as members of founding families. We calculate the share capital of inside shareholders in relation to the total share capital (in percent), which was present at the general meetings. The numbers vary between the six different time periods. The share capital of management shareholders was highest during the period of World War I (31.14 percent) and in the period after the hyperinflation (19.73 percent). After 1913, the share capital of the supervisory board did not change much over time, remaining between 10 and 12 percent over the whole period. In total, family founders accounted for the most of the share capital of inside shareholders at the general meetings. On average, about 40 percent of the share capital was held by inside shareholders at the general meetings over time. We then calculate the share capital in relation to the total share capital of the companies (in percent). In total, about 17.1

Table 3.8: Ownership Concentration Over Time

	C1	C3	C5	Cthreshold	Herfindahl	Number of general meetings
Panel A: Periods according to historical structural breaks						
1869–1913	0.45	0.66	0.75	1.4	0.32	112
1914–1917	0.46	0.6	0.72	1.04	0.31	27
1918–1922	0.47	0.7	0.81	1.18	0.34	277
1923–1928	0.48	0.69	0.8	1.12	0.35	152
1929–1933	0.48	0.7	0.78	1.27	0.35	144
1934–1945	0.46	0.71	0.82	1.28	0.32	73
1869–1945	0.47	0.69	0.79	1.22	0.34	785
Panel B: Periods in decades according to Franks et al. (2006)						
1870	0.28	0.65	0.79	1.5	0.18	2
1890	0.46	0.79	0.89	1.17	0.34	6
1900	0.42	0.66	0.76	1.55	0.31	45
1910	0.46	0.64	0.73	1.26	0.32	68
1920	0.47	0.7	0.81	1.17	0.35	353
1930	0.47	0.69	0.78	1.23	0.34	280
1940	0.49	0.76	0.86	1.23	0.35	30
all	0.28	0.65	0.79	1.5	0.18	785
Panel C: Calculations from Franks et al. (2006, p. 564)						
1890	0.33	0.6	0.71	1.88	0.18	8
1900	0.42	0.7	0.8	1.32	0.23	19
1910	0.46	0.73	0.83	1.21	0.27	29
1920	0.47	0.75	0.86	1.32	0.29	41
1930	0.44	0.75	0.86	1.22	0.23	36
1940	0.58	0.82	0.9	1	0.37	17
1950	0.51	0.76	0.86	1	0.31	6
all	0.46	0.74	0.84	1.26	0.27	156

Note. Panel B: Firm observations are allocated to the nearest corresponding decade.
Source. See Appendix of chapter 3, authors' own calculations.

percent of the share capital was held by inside shareholders. Family founders accounted

for the most of the total share capital of the companies (8.19 percent), whereas members of the management board held on average 5.21 percent of the total share capital and members of the supervisory board held on average 3.89 percent of the total share capital. Taking the shareholdings of the members of the management board, then from 1929 onwards there is a separation between executive power and partnership in shares.

Table 3.9: Share Capital of Inside Shareholders

	Share capital in relation to the share capital at the General Meeting (in percent)			Share capital in relation to total share capital (in percent)		
Decade	Management	Supervisory board	Family founder	Management	Supervisory board	Family founder
1869–1913	5.87	4.62	22.8	0.94	0.6	9.07
1914–1918	31.14	10.97	14.26	8.2	1.51	5
1919–1923	9.47	10.05	17.59	3.17	3.2	4.89
1924–1928	19.73	9.02	26.21	9.55	4.06	20.82
1929–1933	9.96	12.99	17.21	5.63	7.23	8.19
1934–1945	7.87	12.84	2.57	3.77	6.72	1.14
Total	14.01	10.08	16.77	5.21	3.89	8.19

Source. See Appendix of chapter 3, authors' own calculations.

In contrast to Franks et al. (2006), our values are lower. For example, Franks et al. find that in 1890, members of the supervisory board exercised about 50 percent of the votes at the general meetings (see Franks et al. 2006, pp. 565-568.). In total, the values show a decline of the vote shares of inside shareholders from 62 percent in 1890 to 29 percent in 1940.

Bol (2018b) also finds lower values of inside shareholders of the Deutsche Bank for the period from 1870 to 1930. In total 8 percent of the share capital (in relation to the total share capital) was held by inside shareholders. Moreover, about 25 percent of the inside shareholders represented the share capital which was present at the general meetings. About 5 percent

of the share capital was held by members of the supervisory board. Members of the management board held a lower proportion of the share capital (about 2 percent).

3.3 Gender, Social Classes and Institutional Investors – Descriptive Statistics

In this section, we provide information about how many men, women and institutional investors were present at general assemblies and how this composition changed within the nearly 50 years of our observation period. Further, we analyze the distribution of investors categorized into social classes over time. This is the first study that investigates social classes and gender distribution of investors on German stock exchanges before 1945. Despite rare studies on individual investors, such as those by John Maynard Keynes (Chambers et al. 2013, 2015, 2016) and Joseph Frisch (see Lehmann-Hasemeyer and Neumayer 2019 and chapter 5 of this dissertation), the only comparable studies covering our observation period were for England (Rutterford et al. 2017 or Sotiropoulos and Rutterford 2018).

We define gender and whether it was a private or institutional investor primarily named on the list. Following this procedure, we observe a total of 647 female investors, of which 24 were classified as widows. Furthermore, we observe 8,334 male investors and 992 institutional investors (see Table 3.10). In four cases, married couples were mentioned as investors. We assign these cases to female investors, assuming that the women had a say if they were mentioned. In 44 other cases, we only have information that a representative of a group of heirs or communities acted as investors. These are summarized in the category 'unspecific'.

Table 3.10: Gender – Descriptive Statistics

	Women	Men	Institutional Investors	Unspecific	Total
Panel A: Totals					
1869–1913	68	1,634	139	17	1,858
1914–1918	5	307	27	1	340
1919–1923	155	2,694	276	6	3,131
1924–1928	330	2,598	424	10	3,362
1929–1933	80	1,602	269	8	1,959
1934–1945	34	548	222	2	806
Total	647	8,334	992	44	10,017
Panel B: In percent					
1869–1913	3.66	87.94	7.48	0.91	100
1914–1918	1.47	90.29	7.94	0.29	100
1919–1923	4.95	86.04	8.82	0.19	100
1924–1928	9.82	77.28	12.61	0.3	100
1929–1933	4.08	81.78	13.73	0.41	100
1934–1945	4.22	67.99	27.54	0.25	100
Total	6.46	83.2	9.9	0.44	100
Panel C: Average share of votes per person					
1869–1913	5.79	2.92	9.48	0.94	
1914–1918	5.2	3.78	11.19	59.87	
1919–1923	3.94	4.51	11.06	1.52	
1924–1928	0.77	2.55	7.85	0.13	
1929–1933	3.4	4.01	9.3	2.04	
1934–1945	6.91	5.71	5.12	10.28	
Total	10.85	58.06	45.25	6.69	
Panel D: Average share of the whole group at general meeting (0 vote if nobody from the group present)					
1869–1913	4.6	63.95	25.83	0.14	
1914–1918	1.73	52.64	28.59	2.22	
1919–1923	2.51	58.86	29.31	0.05	
1924–1928	1.66	48.69	41.76	0.01	
1929–1933	2.43	52.21	36.31	0.08	
1934–1945	4.17	54.27	36.47	0.42	
Total	2.76	55.77	33.14	0.17	

Source. Various, please see Appendix of chapter 3. Authors' own calculations.

These total numbers certainly underestimate the impact of institutional investors, since

while most other investors only appeared once or twice, some institutional investors appeared every year for more than one firm and held larger shares. This is better reflected in the shares per period (Panel B). The share of male investors fell from 87.9 percent to about 67.9 percent under the Nazi reign. In comparison, the share of women drops from the first to the second period (3.7 percent to 1.5 percent), rising then to 9.8 percent in the period after the hyperinflation, but then falling again to about 4.2 percent in the period under the reign of the National Socialists. Regarding the institutional investors attending the meetings, we obtain a constant rise from 7.5 to 27.5 percent. Panel C shows the average share of votes for the different groups. In most cases, we have the number of votes for each investor. If we do not have the vote, we assume that the share of capital equals the share of votes. The share of female votes seems to have been lowest for all groups. The average share of men was the largest. However, this distribution is highly skewed. Panel D shows the average impact of women, if we include the meetings in which no woman was present with a zero vote. Thus, it reflects the actual average impact of women per period. As one can see, the share is very low and never reaches more than 5 percent. It is interesting that especially in the period 1924–1928, where we observe most women, the share declines. More women attended the meetings, but with smaller shares, whereas in the Empire years, only women with large shares attend. Any hesitations about attending a meeting seem to have declined, although the individual impact was low.

Panel A reveals another interesting feature: While men obviously appear in more than one period, the women seem to have appeared in one or two periods only, since the sum of individual investors per period nearly adds up to 647. However, this could be driven by a financial engagement in just one firm over a number of years, and thus we further investigate not just the number of meetings at which investors appear, but also the number of firms with

which investors were engaged (see Table 3.11).

Table 3.11: Degree of Involvement by Gender

Number of firms in which investors invested	Women	Men	Institutional Investors	Unspecific	Total
Panel A: Totals					
1	639	7,588	797	43	9,067
2	8	559	102	1	670
3	0	115	25	0	140
4	0	38	12	0	50
5	0	15	13	0	28
More than 5	0	19	43	0	62
Totals	647	8,334	992	44	10,017
Panel B: In percent					
1	98.76	91.05	80.34	97.73	90.52
2	1.24	6.71	10.28	2.27	6.69
3	0	1.38	2.52	0	1.4
4	0	0.46	1.21	0	0.5
5	0	0.18	1.31	0	0.28
More than 5	0	0.23	4.33	0	0.62
Panel C: Average engagement in years					
Mean	0.31	0.58	0.92	0.62	
Median	0	0	0	0	
Max.	22.04	35.06	26.06	35.06	

Source. Various, please see Appendix of chapter 3. Authors' own calculations.

Clearly, most of our investors invested in just one firm over time. However, while we observe that about 9 percent of the male investors and about 20 percent of the institutional investors invested in more than one company, almost all of the women invested in a single firm, and only eight held shares of two different firms.

Furthermore, we take a closer look at the female investors to understand why they held shares of the particular companies. However, due to the lack of information, we can only study few cases. It seems, however that the female investors were often members of the founding family. Anna Langheinrich, for instance, held shares of Graphitwerke Kropfmühl AG in 1925. In this year she was also the official director of this company and therefore one of the few female entrepreneurs of the time (see Handbuch der Deutschen Aktiengesellschaften 1925, p. 549). Two further, cases were the female shareholders of the Papierfabrik August Koehler AG in Oberkirch and the Papierfabrik Wilhelm Euler in Bensheim. With Anna Maria Goetz and Wilhelmine Rettner, it happened that two women of the founding family were members of the supervisory board of both companies, since both companies held holdings together (Krämer 2007).

To get a better idea of who the institutional investors are, we look at them in more detail in Table 3.12. Here, we divide the investors into different industrial branches following Lehmann-Hasemeyer and Opitz (2019). The branches are divided into 11 categories: banking, insurance, mining, heavy industry, light industry, food processing, transportation, chemical industry, public utilities, diverse, and not assignable if we could not assign the investors to a certain category. The highest percentage (70.26) of institutional investors comes from the banking sector. This does not necessarily mean that banks were the owners of the shares, as before WWI, banks held only a few major, long-term direct stakes in non-financial firms (Fohlin 2007, p. 120). However, they held substantial control over joint-stock firms through

Table 3.12: Institutional Investors – Descriptive Statistics

Sector	1896–1913	1914–1918	1919–1923	1924-1928	1929-1933	1934–1945	Total N	Total in percent
Panel A: Totals								
Banking	82	22	126	184	123	160	697	70.26
Insurance	1	1	4	14	0	3	23	2.32
Mining	0	1	5	14	11	3	34	3.43
Heavy industry	6	3	18	18	18	9	72	7.26
Light industry	10	0	13	32	10	9	74	7.46
Food processing	7	0	6	8	12	1	34	3.43
Transportation	2	0	3	4	6	5	20	2.02
Chemistry	0	0	4	6	2	0	12	1.21
Public utility	1	0	8	26	19	15	69	6.96
Diverse	9	0	77	92	59	13	250	25.2
Not assignable	21	0	10	26	8	2	67	6.75
Total	143	27	274	427	268	220	992	100
Panel B: In percent								
Banking	57.34	81.48	45.99	43.09	45.9	72.73	70.26	57.34
Insurance	0.7	3.7	1.46	3.28	0	1.36	2.32	0.7
Mining	0	3.7	1.82	3.28	4.1	1.36	3.43	0
Heavy industry	4.2	11.11	6.57	4.22	6.72	4.09	7.26	4.2
Light industry	6.99	0	4.74	7.49	3.73	4.09	7.46	6.99
Food processing	4.9	0	2.19	1.87	4.48	0.45	3.43	4.9
Transportation	1.4	0	1.09	0.94	2.24	2.27	2.02	1.4
Chemistry	0	0	1.46	1.41	0.75	0	1.21	0
Public utility	0.7	0	2.92	6.09	7.09	6.82	6.96	0.7
Diverse	6.29	0	28.1	21.55	22.01	5.91	25.2	6.29
Not assignable	14.69	0	3.65	6.09	2.99	0.91	6.75	14.69
Total	100	100	100	100	100	100	100	100

Notes. The sectoral classification is from Lehmann-Hasemeyer and Opitz (2019, p. 79). The heavy industry category contains: engineering firms, metal working, and railway requirements. Light industry contains: the textile sector, paper industry, glass industry, and rubber industry. Food processing contains: breweries and mills. Public utility contains: electricity, gas and water. Diverse contains: hotel companies, terrain companies and mortgage banks.
Source. Various, please see Appendix of chapter 3. Authors' own calculation.

proxy voting. In the pre-war era, proxy voting was established in two ways. The first is irrelevant to our study: a shareholder could transfer his/her voting rights to a bank ("Stimmrechtsermächtigung"), allowing the bank to cast votes in the shareholder's name. In these cases, the shareholders had to reveal their identity, and these details are available in the lists of the general meetings. The second way, which was more important in practice, was the so-called "Bankenstimmrecht" or "Depotstimmrecht". This is much trickier and explains the large share of banks as institutional investors in our sample. According to Fohlin (2007, p. 122), many banks required their customers to transfer their votes automatically upon opening securities accounts, granting the banks a widespread ability to control rights of equity stakes they did not own. Banks could do more or less whatever they wished with these voting rights (see Fohlin 2007, pp. 122–124). As one can see, the influence of large banks was indeed high with on average more than 50 percent.[6]

We then classify the investors into social classes depending on occupation and academic title. Thereby, we follow the existing classification of Schüren (1989).[7]

Schüren analyzes the history of social mobility in Germany in the 19th and 20th centuries, using a broad data set of thousands of occupational details. His work represents one of the largest and most comprehensive investigations of the socio-economic ascent and descent possibilities in two centuries of German social history. His classification is intertemporal valid and has consensus among social historians such as Hartmut Kaelble or Jürgen Kocka (see Schüren 1989, pp. 313ff.). Since we have information about the occupations of the investors, we can easily follow the existing classification of Schüren and classify our occupational investors' data into these social classes. Table 3.13 reports the classification scheme used by

[6] In the context of the "Depotstimmrecht", see also Planitz (1922, pp. 10-21).

[7] For the whole text of Schüren's classification scheme, see Schüren (1989, pp. 313ff.).

Schüren. He distinguishes the working class, the lower middle class, the higher middle class and the upper class based on occupations. The working class contains skilled workers, craftsman, skilled industrial workers, and lower civil servants and employees. The lower middle class contains small farmers, merchants, masters/hosts and middle civil servants and employees. The higher middle class contains full-time farmers, medium-sized entrepreneurs and senior civil servants and top officials. The upper class contains mostly landowners, large manufacturers, academics and upper senior officials.

We are aware of the fact that during our period of interest, political changes, wars and financial depressions, for example, led to changes in the social structure and occupational system of society. Therefore, occupations may have to be assigned to different social classes for different times. This is also already covered in the classification of Schüren. In instances where we only have information about the title of an investor (e.g., Prof., Dr., Ing.), we try to classify their occupation based on the title. For most cases, this was relatively easy, because most of the titles are academic titles that we can easily assign to the group of academics and the upper class. We also assign investors with a title of nobility (e.g., Exzellenz, Graf, Freiherr von) to the upper class, even if there was no indication of their profession in our data. Some of the investors owned an honorary title such as, for example, Geheimer Kommerzienrat, Geheimer Regierungsrat or Geheimer Medizinalrat. These investors were also assigned to the upper class, since these titles were awarded only to high-level personalities in the economy and after significant achievements for the common good of society.

Table 3.14 shows the descriptive statistics of the investors divided into social classes. In total, the sample contains 4,175 investors for which we have information on their occupation. The

majority come from the upper class (89.99 percent).[8]

Table 3.13: Social Classes – Classification Scheme

Social classes
I. Working Class
1. Skilled Workers 2. Craftsman 3. Skilled Industrial Workers 4. Lower Civil Servants and Employees
II. Lower Middle Class
1. Small Farmers 2. Merchants 3. Masters and Hosts (Master Craftsmen, Innkeepers, Shopkeepers, etc.) 4. Middle Civil Servants and Employees (Foremen, Assistants, etc.)
III. Higher Middle Class
1. Full-time Farmers 2. Medium-sized Entrepreneurs (incl. Men of Private Means, Wholesalers) 3. Senior Civil Servants and Top Officials (Engineers, Inspectors, Authorized signatories)
IV. Upper Class
1. Landowners, Large Manufacturers, Academics, Upper Senior Officials

Notes. Originally, Schüren distinguished six social classes. We have omitted the subdivision of the working class into the lower, middle and higher working class, because there are few observations of the working class.
Source. Schüren (1989, p. 35).

About 7.16 percent come from the higher middle class, 2.78 percent from the lower middle class, and only 0.07 percent from the working class. Looking at the changes over time, in the

[8]This observation may also be due to the fact that shareholders from lower social classes did not have the financial means, free time, and, given smaller share packages, probably simply a lack of motivation to attend these shareholder meetings. Looking at those investors who had their residence at a place different than the general assembly (more than 100 kilometer away), it is striking that about 93 percent of the shareholders attending the meeting came from the upper class. Only 7 percent came from lower social classes. This could be an indication that shareholders from lower social classes had no funding, or did not have the time to attend the assembly.

first period, we find 94.72 percent of investors from the upper class. In the second period, this rises to 96.70 percent, but then it continuously falls to 88.45 percent in the last period.

In comparison, the share of the investors from the higher middle class drops from the first to the second period (3.57 percent to 2.75 percent), before rising to 8.81 percent in the last period. We obtain a similar picture for the share of the lower middle class, where we see a rise from 0.55 percent from the second period to 3.25 percent in the fifth period, but then falling to 2.74 percent in the sixth period. The proportion of the working class is very low, and only in the third and fifth periods is it slightly higher than 0 (0.07 percent, and 0.22 percent). The table reveals that in the 19th century, most shares were in the hands of the men of the upper class. However, this slightly changes in the 1920s, when ownership became more and more available to lower social classes, which is also reflected in the higher shares of investors from the middle and working classes.

Altogether, rising democracy and price disturbances after the period of hyperinflation seem to be accompanied by a rising share of female investors and a rising share of investors from lower social classes. However, the shares of female investors and lower social classes remain relatively low, and we observe a rise in concentration at the same time. Thus, while these observations confirm our hypothesis, they also show that the joint-stock firms were still firmly in the hands of few investors from the upper class and institutional investors, which were mostly banks.

In the following section, we analyze the investors from the upper class in more detail. For a better overview, we classify the occupations of the investors into different categories. As a basis for the categorization, we follow the classification scheme of occupations according to Mathew (1978, p. 280). He distinguishes between different occupational classes (admin-

istration, military, church, trade and industry, lawyers, medicine, teaching, aristocracy and property and forestry). In addition to Mathew (1978), there will be an adjustment of the occupational classes. The existing categories have been expanded to include categories of academics, banking, directors, honorary title as well as agriculture and forestry. The group of academics includes all persons with a doctor and/or professor title who could not be further specified. The new category of directors has been included, as this has often been noted in the data as an occupational description, but usually is not specified in which type of company the director was active. Banking includes all shareholders who are employed in the banking sector (also bank directors). The group of honorary titles include persons of which we only have information of the title: Kommerzienrat, geheimer Kommerzienrat, or Ritter.

Table 3.15 shows the results. The professional class of the directors are represented the most with on average 20.37 percent. Academics are represented with 18.52 percent and bankers with 13.94 percent, followed by categories of administration and lawyers with 11.64 percent and 10.43 percent. All other occupational categories are rather underrepresented in the sample. Female investors were mostly from the aristocracy or had a honorary title. In three cases the female investors were the official directors of the company. Table 3.16 shows the percentage of shareholders by occupational groups and by industry. The percentage of bankers or bank directors who invested in the banking sector was relatively high compared to the other occupational groups, who invested in the banking sector (21.61 percent). The percentage of directors was highest in the heavy industry and the transportation sector (35.25 percent and 29.33 percent) and was in all other sectors also very high. Companies from the chemistry sector had a high percentage of shareholders from the occupational class of the academics. The percentage of shareholders from the aristocracy was large for the insurance sector.

Table 3.14: Social Classes – Descriptive Statistics

	Share of upper class	Share of higher middle class	Share of lower middle class	Share of working class	Total
Panel A: Totals					
1869–1913	664	25	12		701
1914–1918	176	5	1		182
1919–1923	1294	102	46	1	1,443
1924–1928	1184	102	36		1,322
1929–1933	793	68	29	2	892
1934–1945	291	29	9		329
Total	3,757	299	116	3	4,175
Panel B: In percent					
1869–1913	94.72	3.57	1.71	0	100
1914–1918	96.7	2.75	0.55	0	100
1919–1923	89.67	7.07	3.19	0.07	100
1924–1928	89.56	7.72	2.72	0	100
1929–1933	88.9	7.62	3.25	0.22	100
1934–1945	88.45	8.81	2.74	0	100
Total	89.99	7.16	2.78	0.07	100
Panel C: Average share of the whole group at general meeting (0 vote if nobody from the group present)					
1869–1913	38.48	10.95	8.99	0	
1914–1918	45.07	3.72	0.49	0	
1919–1923	38.94	8	13.13	0.03	
1924–1928	34.5	3.92	5.36	0	
1929–1933	39.92	8.2	6.13	0.05	
1934–1945	44.71	15.87	2.42	0	
Total	38.99	8.43	8.37	0.05	

Note. The classification scheme is from Schüren (1989, p. 35).
Source. Various, please see Appendix of chapter 3. Authors' own calculation.

Table 3.15: Number and Percentage of Shareholders by Each Occupational Group, by Period.

	N	%	N	%	N	%	N	%	N	%	N	%
Occupational Groups	1869–1913		1914–1918		1919–1923		1924–1928		1929–1933		1934–1945	
Aristocracy and Property	72	10.84	10	5.68	85	6.57	118	9.97	50	6.31	16	5.5
Academics	116	17.47	22	12.5	261	20.17	240	20.27	173	21.82	55	18.9
Banking	148	22.29	40	22.73	104	8.04	89	7.52	93	11.73	33	11.34
Directors	89	13.4	25	14.2	316	24.42	264	22.3	170	21.44	77	26.46
Honorary Title	91	13.7	20	11.36	134	10.36	89	7.52	41	5.17	15	5.15
Trade and Industry	13	1.96	5	2.84	62	4.79	47	3.97	60	7.57	18	6.19
Lawyers	51	7.68	24	13.64	105	8.11	93	7.85	92	11.6	40	13.75
Church	2	0.3	1	0.57	3	0.23	7	0.59	3	0.38	1	0.34
Agriculture and Forestry	0	0	0	0	3	0.23	6	0.51	1	0.13	2	0.69
Teaching	0	0	0	0	1	0.08	3	0.25	1	0.13	1	0.34
Medicine	4	0.6	2	1.14	17	1.31	25	2.11	11	1.39	5	1.72
Military and Marine	8	1.2	4	2.27	23	1.78	24	2.03	12	1.51	1	0.34
Administration	68	10.24	22	12.5	165	12.75	177	14.95	83	10.47	26	8.93
Diverse	2	0.3	1	0.57	15	1.16	2	0.17	3	0.38	1	0.34
Total	664	100	176	100	1,294	100	1,184	100	793	100	291	100

Notes. The classification scheme is from Mathew (1978, p. 280). The category aristocracy and property includes people from the aristocracy and landowners. Academics includes all persons with a doctor and/or professor title, who could not be further specified. The category of directors contains directors, who could not be further specified. Banking contains employers and employees in the banking sector (also bank directors). Honorary titles contains persons entitled with: e.g. Kommerzienrat, geheimer Kommerzienrat, or Ritter. Industry and commerce contains merchants, employers and employees in this area, business owners as well as engineers. The categories Lawyers and Church contain lawyers and pastors. Agriculture and Forestry contains tenant farmers and foresters. The category Teaching and Medicine includes teachers and medical doctors. Military and Marine contains high ranking officers and generals. The administration group includes mayors, members of parliament as well as administrative officials. The category Diverse includes reindeers, private individuals, authorized signatories and all not clearly assignable occupational classes.
Source. Various, please see Appendix of chapter 3. Authors' own calculation.

Table 3.16: Percentage of Shareholders by Each Occupational Group, by Industry.

Industry:	Banking	Insurance	Mining	Heavy Industry	Light Industry	Food Processing	Trans-portation	Chemistry	Public Utility	Diverse
Occupational Group										
Aristocracy and Property	7.52	17.39	6.38	7.31	7.37	6.46	4	7.06	10.39	3.51
Academics	14.93	21.98	23.4	23.24	14.74	20.36	16	43.53	16.85	28.57
Bank	21.61	1.21	14.89	7.57	11.43	6.46	12	4.71	10.39	8.77
Directors	14.82	23.91	17.82	35.25	21.62	20.52	29.33	23.53	20.43	24.06
Honorary Title	11.9	5.07	2.93	4.44	12.16	8.24	5.33	7.06	8.6	10.78
Trade and Industry	1.67	3.38	5.59	3.66	9.83	5.01	1.33	0	3.58	3.76
Lawyers	12.21	6.76	9.57	6.79	9.09	9.05	9.33	4.71	7.17	9.27
Church	0.42	0.24	0.27	0	0.86	0.16	0	0	1.08	0
Agriculture and Forestry	0.1	0.24	0	0.26	0	1.29	0	0	0.36	0
Teaching	0.1	0.24	0	0.26	0	0.32	0	0	0.36	0
Medicine	1.88	3.14	1.33	0	0.86	1.94	0	1.18	2.51	0.25
Military and Marine	0.52	2.17	1.6	0.78	2.21	3.72	1.33	1.18	1.43	0.5
Administration	12.11	12.56	15.69	10.44	8.72	15.19	18.67	7.06	16.85	10.53
Diverse	0.21	0.24	0.53	0	1.11	1.29	2.67	0	0	0
Total (in percent)	100	100	100	100	100	100	100	100	100	100
Total N	958	414	376	383	814	619	75	85	279	399

Source. Various, please see Appendix of chapter 3. Authors' own calculation.

3.4 Correcting for Selection Bias

The descriptive statistics confirm our hypothesis that the rising democracy and the price disturbances of hyperinflation go together with a rising share of other social classes as well as a rising share of female investors. However, these descriptive statistics might be biased by selection of available information on general meetings. In some periods, we observe more general meetings than in others, as well as different branches and different firm sizes. Thus, we aim at establishing our observations from the descriptive statistics in a more elaborate way.

First, we construct a dataset at the level of investors and years. Few investors appear more than once in the dataset. If, for instance, investor X attends a general meeting in 1900 and a meeting of the same firm in 1905, we would observe her twice. However, since we are interested in the probability of certain characteristics over time and most investors do not appear more than once, we stick with simple ordered logit and logit regressions and cluster the standard errors by investors. The dependent variables are social class rankings from 1 to 4 (regression 1 and 2), equal to one if the investor was a woman (regression 3 and 4) or an institution (5 and 6). Since we are mostly interested in how the probability of these characteristics changed over time, and especially in the period between 1924 and 1933, we add dummy variables for certain periods. We further control for the share of extraordinary meetings, because the incentive to attend these meetings might have been different. We also control for the average distance between an investor's residence and the location of the general meeting as a measure of transport cost as well as the total number of investors per year to account for potential selection bias. The results, shown in Table 3.17, clearly confirm our descriptive statistics. The probability of coming from a lower social class declines during World War I, but increases significantly after 1923 and 1933. The likelihood that women become investors also

Table 3.17: Probability of Appearance of an Investor's Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variables	Socialclass		Women=1		Institutional investors=1	
	Ordered logit		Logit			
1914–1917	-1.006**		-0.445		-0.272	
	(0.46)		(0.668)		(0.254)	
1918–1922	0.42		-1.015***		0.416***	
	(0.266)		(0.302)		(0.138)	
1923–1928	0.818***		0.19		0.813***	
	(0.249)		(0.224)		(0.142)	
1929–1933	1.040***		0.111		0.790***	
	(0.261)		(0.235)		(0.147)	
1934–1945	0.635**		0.142		1.539***	
	(0.294)		(0.297)		(0.139)	
1924–1933		0.627***		0.747***		0.327***
		(0.129)		(0.114)		(0.0855)
Share of extraordinary meetings	0.0839	0.0697	0.958***	1.005***	-0.168**	-0.136**
	(0.115)	(0.116)	(0.0972)	(0.099)	(0.0669)	(0.0656)
Distance from investor's residence to location of GM	-0.228***	-0.221***	0.0290**	0.0313**	0.0236**	0.0290**
	(0.078)	(0.0771)	(0.0128)	(0.0131)	(0.0114)	(0.0135)
Number of investors per year	6.92E-05	0.000230**	0.000972***	0.000485***	-0.000313***	-0.000367***
	(0.000145)	(0.000117)	(0.000156)	(9.97E-05)	(8.01E-05)	(6.39E-05)
Share of large firms	-0.667***	-0.626***	-0.368***	-0.371***	0.0187	0.0128
	(0.157)	(0.159)	(0.107)	(0.107)	(0.0919)	(0.0893)
Constant cut2	3.775***	3.646***				
	(0.242)	(0.17)				
Constant cut3	7.576***	7.447***				
	(0.643)	(0.623)				
Observations	6,354	6,354	14,032	14,032	14,032	14,032

Notes. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1, clustered by investors. All regressions included a constant which is not reported.

rises after 1923. The presence of institutional investors, however, seem to rise constantly over the whole period of observation.

One might argue that a logit is not able to trace the actual impact, since vote shares might have been very different. Thus we run OLS regressions in which the log of the vote share is the dependent variable. We control for gender and whether the investor was institutional. We also add dummies for the time periods and control for the share of extraordinary meetings, distance and number of investors per year, as above. The results are shown in Table 3.18. One can clearly see that the share of votes for men and women do not significantly differ. However, unsurprisingly, institutional investors have significantly more votes than ordinary investors. If we include the variable of social class, ranking from 1 (upper class) to 4 (lower middle class), it seems that the vote share of the lower class decline significantly. However, if we only add a dummy for investors from the middle class (the one that we used in the logit regressions), the voting share is not significantly different.

In a second step, we aggregate the data at the level of general meetings. More precisely, since we observe, on average, about six general meetings per firm, we construct an unbalanced panel, where the ID variable is the firm and the time variable is the date of the general meeting. Here, we focus first on the measures of concentration from section 3.2 and show whether they changed over time if we control for meeting specific characteristics and, additionally, for time-invariant firm characteristics with firm fixed effects. The results confirm the findings of the descriptive statistics and are shown in Table 3.19. Overall, the level of concentration is remarkably stable. Only C1 seems to significantly increase in the period of 1923 to 1933. However, the coefficients slightly increase over time. Thus, we re-estimate the regressions including only one time dummy for the period of 1924–1933.

Table 3.18: Vote Shares

	(1)	(2)	(3)	(4)	(5)
Dependent variable			ln(vote share)		
Sample	All investors that could be categorized		Only male and female investors	All investors that could be categorized	
Women	-0.321**	-0.0692	-0.0924		
	(0.154)	(0.152)	(0.155)		
Institutional investors			1.545***		
			(0.114)		
Social class				-0.172*	
				(0.104)	
Social class below upper class (<3)					-0.157
					(0.234)
1914–1917	-0.046	-0.139	-0.0198	-0.316	-0.309
	(0.2)	(0.21)	(0.196)	(0.29)	(0.29)
1918–1922	2.027***	2.261***	1.970***	2.414***	2.414***
	(0.108)	(0.112)	(0.107)	(0.165)	(0.165)
1923–1928	0.0783	-0.0939	-0.057	0.291*	0.287*
	(0.102)	(0.106)	(0.0991)	(0.161)	(0.16)
1929–1933	0.11	0.0243	0.000436	0.326*	0.318*
	(0.106)	(0.114)	(0.104)	(0.168)	(0.168)
1934–1945	0.0239	0.484***	-0.342**	0.814***	0.805***
	(0.138)	(0.163)	(0.153)	(0.216)	(0.216)
Share extraordinary meetings	-0.354***	-0.189***	-0.333***	-0.157*	-0.156*
	(0.0588)	(0.0611)	(0.0578)	(0.0806)	(0.0806)
Number of investors per year	-0.00155***	-0.00177***	-0.00151***	-0.00167***	-0.00167***
	(7.15E-05)	(7.50E-05)	(7.10E-05)	(9.86E-05)	(9.87E-05)
Distance from investor's residence to location of GM	0.0158*	0.0183*	0.00925	-0.0195*	-0.0184
	(0.0088)	(0.00941)	(0.00959)	(0.0115)	(0.0115)
Observations	12,911	11,142	12,911	5,886	5,886
R-squared	0.084	0.119	0.122	0.098	0.098

Notes. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1, clustered by investors. All regressions included a constant which is not reported.

Table 3.19: Concentration Over Time, Panel

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variables	ln(herfindahl)	ln(c1)	ln(c3)	ln(cthres)	ln(herfindahl)	ln(c1)	ln(c3)	ln(cthres)
		pooled				FE		
1914–1917	-0.00838	0.11	-0.0591	-0.354***	0.0998	0.444**	0.0717	-0.434***
	(0.0833)	(0.23)	(0.0788)	(0.126)	(0.0881)	(0.223)	(0.0912)	(0.119)
1918–1922	-0.0439	-0.154	-0.00271	0.0831	-0.00139	0.126	0.0167	-0.0672
	(0.07)	(0.22)	(0.0674)	(0.157)	(0.0721)	(0.236)	(0.0878)	(0.132)
1923–1928	-0.00332	0.0351	0.00577	-0.161	0.0973	0.359*	0.0688	-0.194*
	(0.0715)	(0.218)	(0.0634)	(0.141)	(0.0618)	(0.189)	(0.0702)	(0.117)
1929–1933	0.00109	0.0353	0.0172	0.000305	0.0797	0.327	0.078	-0.165
	(0.0683)	(0.213)	(0.0608)	(0.181)	(0.0676)	(0.209)	(0.0753)	(0.125)
1934–1945	-0.00511	0.0796	0.0372	-0.0673	0.0297	0.214	0.0445	-0.0414
	(0.0687)	(0.223)	(0.068)	(0.151)	(0.0777)	(0.254)	(0.0891)	(0.146)
Extraordinary	-0.0186	-0.0477	-0.0574*	0.0753	0.00157	0.0375	5.79E-05	-0.0777
meetings (=1)	(0.0218)	(0.0691)	(0.031)	(0.102)	(0.0266)	(0.0764)	(0.021)	(0.0623)
Overall share	0.00782	0.0253	0.00172	0.00233	-0.0169	-0.00999	0.00308	-0.00162
capital per year	(0.00884)	(0.0348)	(0.0133)	(0.0241)	(0.0115)	(0.0356)	(0.0123)	(0.0316)
Number of GMs	0.00074	0.00381	0.000846	-0.00505**	0.00193**	0.00304	0.0013	-0.00118
per year	(0.000827)	(0.00269)	(0.00108)	(0.00219)	(0.000847)	(0.00288)	(0.00107)	(0.0022)
Firm fixed effects	n	n	n	n	y	y	y	y
Observations	721	721	760	720	710	710	749	709
R-squared	0.012	0.019	0.016	0.032	0.033	0.037	0.029	0.045
Number of firms	257	257	272	257	257	257	272	257

Notes. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. All regressions included a constant which is not reported.

Table 3.20: Concentration Over Time, 1924–1933

	(1)	(2)	(3)	(4)
Dependent variables	ln(herfindahl)	ln(c1)	ln(c3)	ln(cthres)
1924-1933	0.0716**	0.201**	0.0505	-0.115
	(0.0305)	(0.1)	(0.0334)	(0.0809)
Extraordinary meetings (=1)	0.000655	0.0331	-0.00189	-0.0763
	(0.0258)	(0.0716)	(0.0205)	(0.0606)
Overall share capital per year	-0.0163	-0.0197	-0.000431	0.0019
	(0.0123)	(0.0348)	(0.0105)	(0.0307)
Number of GMs per year	0.00148*	0.0028	0.00128*	-0.000837
	(0.000815)	(0.00236)	(0.000699)	(0.00198)
Firm fixed effects	y	y	y	y
Observations	710	710	749	709
R-squared	0.022	0.02	0.024	0.015
Number of firms	257	257	272	257

Notes. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1, clustered at firm level. All regressions included a constant which is not reported.

As Table 3.20 reveals, this time dummy is significant for the Herfindahl index and the share of the largest investors. Thus, concentration do rise significantly in the period after hyperinflation until the Nazis took over.

We then run the same model, using the share of women and the mean of social class as dependent variables. The results are shown in Table 3.21. This regression reveals some interesting new aspects. First, the share of lower social classes does not change significantly over time; in fact, it seems to decline. Furthermore, the share of women rises after 1919, similar to our previous findings, if we estimate the panel without firm fixed effects. If we include firm fixed effects, the share of women falls significantly in our observation period. Since 98 percent of the women were only engaged in one firm, this reveals that some of these women

Table 3.21: Panel

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variables	Socialclass		Share of women		Socialclass		Share of women	
1914–1917	0.0227	0.0427	0.0064	-0.0133				
	(0.0917)	(0.0792)	(0.0166)	(0.0185)				
1918–1922	-0.0189	0.00277	0.0368*	0.0195				
	(0.0429)	(0.0626)	(0.0188)	(0.0179)				
1923–1928	-0.00445	-0.0149	0.0252	0.00077				
	(0.0315)	(0.0325)	(0.0163)	(0.0132)				
1929–1933	0.00395	-0.00934	0.0269*	-0.00444				
	(0.0344)	(0.0385)	(0.0142)	(0.0121)				
1934–1945	0.0274	0.00592	0.0298*	0.0151				
	(0.0404)	(0.0627)	(0.0157)	(0.0158)				
1924–1933					0.000382	-0.0188	0.00487	-0.0135**
					(0.0189)	(0.027)	(0.0132)	(0.00585)
Share of extraordinary	0.00261	0.00574	-0.00715	-0.000375	0.000968	0.00516	-0.00726	-0.000207
meetings	(0.0205)	(0.0191)	(0.00921)	(0.00574)	(0.0209)	(0.0193)	(0.00944)	(0.00568)
Number of GMs (year)	0.000471	-0.000207	-0.000397	-0.000229	9.80E-05	-0.00031	-4.24E-05	-4.81E-05
	(0.000577)	(0.00092)	(0.000298)	(0.000202)	(0.000397)	(0.000549)	(0.000144)	(0.000142)
Herfindahl	-0.051	0.0607	-0.0765***	-0.0415***	-0.0499	0.0651	-0.0774***	-0.0430***
	(0.0571)	(0.0735)	(0.0193)	(0.0133)	(0.0571)	(0.082)	(0.0195)	(0.0147)
Firm fixed effects	n	y	n	y	n	y	n	y
Observations	674	663	721	710	674	663	721	710
R-squared	0.007	0.013	0.058	0.068	0.004	0.01	0.048	0.053
Number of firms	244	244	257	257	244	244	257	257

Notes. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1, clustered at firm level. All regressions included a constant which is not reported.

withdrew their engagement in this period.

3.5 Conclusion

We study the ownership structure of joint-stock firms for the period of 1869 to 1945 based on a unique hand-collected dataset. The data covers a selection of 785 general meetings of 276 firms, covering the information of 10,017 individual investors over the period of 1869 to 1945. We can show that after the hyperinflation of 1923, when shares became cheaper, ownership among the lower social classes and women increased significantly. These results are robust to different approaches that aim at controlling for a potential selection bias. However, the despite the greater participation of women and the lower social classes after 1923, there remained a vast inequality of opportunities in terms of capital ownership and control. Thus, regardless of the political changes and new economic conditions, the control of the joint-stock firms largely remained in the hands of investors from the upper class and large banks.

4

There's No Place Like Home: Investors' Home Bias in Germany, 1898-1934*

The decision to buy and/or to hold stocks is complex and often takes place under considerable uncertainty. To reduce this uncertainty, investors build expectations about future returns and risks, using information on stock market projections, political forecasts and the macro economy. Furthermore, they seek information about certain firms, and observe and

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interpret other investors' decisions. Their expectations therefore depend on the available set of information and the knowledge and experience they bring to interpreting the information. Thus, investors make decisions based on rational expectations, but not every investor has the same information, knowledge and experience. Special knowledge about companies and regional exchanges is often only available locally.[1] Therefore, rational investors with different amounts of information also make different investment decisions. Furthermore, investment decisions are often influenced by psychological and sociological aspects[2], so investment decisions are a product of interactions between economic, psychological and sociological factors. Experience and the socioeconomic profile including level of education, age, gender and factors such as self-confidence play an important role in investment decisions (Goetzmann and Kumar 2008).

To improve interpretations of investor behavior over time, it is necessary to learn more about how much investors trust their own knowledge and how past experiences influence them. A well-documented behavior called home bias is the tendency for investors to overinvest in assets and shares from their home region (Coeurdacier and Rey 2013 or Wójcik 2011). However, even home bias has not been documented extensively for historical periods. So far there is little information about individual investors in Germany and there are only three analyses, none of which are extensive, of investors' home bias in the first half of the 20th century (Wormser 1919, Franks et al. 2006 or Burhop and Lehmann-Hasemeyer 2016). This article looks for evidence of historical home bias, leaving the question of why such bias might have existed for future research.[3]

[1] A broad literature deals with the information advantage of local investors compared to non-local ones. For an overview see for example: Lindblom et al. (2017, pp. 143ff.).

[2] See for instance: Rabin (2002), De Bondt and Thaler (1995) or Shiller (1999).

[3] A broad literature exists on the reasons for home bias at least for modern periods. However, historical

Existing studies use very small samples of local German investors' data in the first half of the 20th century. The major problem with these papers is that they presumably overestimate the effect, due to selection bias: their analysis is based on shareholder attendance lists of general assemblies. Within this data there might already be a bias towards people that live close to the meeting. It seems likely that the probability of investors attending a general assembly of a company based in e.g. Stuttgart is higher for those who reside in Stuttgart, compared to investors residing elsewhere.

This paper evaluates the home bias for historical periods in more detail, by using a larger dataset of 504 shareholder lists from 175 different companies between 1898 and 1934. These shareholder lists are, as already explained, mostly attendance lists of shareholders attending different meetings of the general assembly of the firms. To investigate local investment biases, I calculate the distance between the firm's headquarters and the investors' residence. In a second step, I then split the sample to separate those companies that organized their general assembly in a place other than their headquarters. The idea is to get a better view of the home bias and challenge the problem that these shareholder lists only show a particular selected share of attendant investors which gives rise to selection bias.

The descriptive analysis first shows that local investors were clearly important. A very high number of shareholders lived within 100 kilometers of company headquarters. Challenging these findings in more detail leads to the conclusion that they might be biased because they are mostly based on attendance lists. Analyzing different sub-samples shows a different picture. There is no home bias detected for companies that held their general assembly in a place other than their headquarters. This reveals a different sort of home bias, which has not been

studies have so far dealt more with the description and determination of the home bias phenomenon.

considered yet: a so-called "stock exchange home bias of investors". It seems that it mattered to investors which stock exchange the shares were listed on, and how far away from the investors' place of residence the stock exchange was located.

4.1 Home Bias – The Current State of Research

According to standard portfolio theory, rational investors should hold diversified portfolios of different listed assets (Markovitz 1952). Previous research has shown that this is not the case, at least for modern periods (Merkle and Weber 2014). Instead of diversifying their portfolios and holding domestic as well as foreign assets and shares, the home bias literature indicates that investors prefer assets and shares from their home country and home region.[4] Coeurdacier and Rey (2013) analyze portfolio holdings of investors in the U.S., Japan, and Britain and find evidence of an overinvestment in domestic markets. They look at miscellaneous explanations like hedging motives, asset trade costs and informational and behavior biases, whereas Wójcik gives a definition of different forms of home bias and in addition, a review of the literature. The term home bias focuses on two related behaviors. First, it refers to investors investing in firms located in the same city as their residence. Second, it refers to investors investing in firms located in their home region.[5] According to Wójcik (2011), a limit of 100 kilometers is most commonly used for differentiating between home-bias and supra-regional investments.

Using a sample of investors from the U.S., Japan and Britain, French and Poterba (1991) find evidence that investors hold mostly assets from their domestic market. They also exam-

[4] A recent review of investors home bias can be found in: Coeurdacier and Rey (2013) or Wójcik (2011).

[5] This is also often called "local bias"; see for instance: Wójcik (2011, p. 69). To ensure a uniform procedure only the term "home bias" is used in the rest of the article.

ine the reasons for this preference, which they divide into two categories. On the one hand, there may be institutional restrictions, e.g. taxes that favor a certain home bias. However, they do not find significant evidence for these kinds of institutional differences. They do find that individual expectations matter. In particular, unrealistically high expectations regarding the domestic market returns create a home bias in portfolios. Coval and Moskowitz (1999) investigate the same fact and come to the same results in the case of the strong preference for locally headquartered firms of US investment managers.

Apart from institutional constraints and investor expectations, geographic distance plays a major role in home bias. A small distance between investors' homes and the investment seems to work as a proxy for the local character of information, which then clearly influences the decision to buy shares. Portes and Rey (2005), for instance, find evidence that the geographical distance is an important component in international capital flows.[6]

For Germany, the home bias phenomenon has not been studied closely in a historical context.[7] There are two pioneering studies that focus on characteristics of investors by analyzing

[6]Other studies highlight also the importance of geographical distance and information asymmetries; see for instance: Hau (2001), Lampe and Ploeckl (2014) or Grote et al. (2002).

[7]Information on share ownership is in large parts unavailable for this period, because most of the shares were bearer shares (for the following text on share ownership see: Burhop 2011, pp. 15f.). Thus, there is little information about individual investors. The only characteristic which all shareholders had in common is that they were relatively rich, because the shares were increasingly expensive. Between 1870 and 1884, the minimum face value of a share was 300 Marks. This was only 40 percent that had to be paid before the IPO. With offerings below par being prohibited, the minimum investment to buy one share was 120 Marks. Stock market shares were therefore still well within reach of the middle classes. But in 1884 the corporate law increased the minimum face value of a share to 1,000 Marks and only fully paid shares were possible for an IPO. This was an extremely high minimum investment. If you compare this to the average annual wage of 1,300 Marks of a German industrial worker in 1913, it seems unlikely that workers or even middle-class employees held shares (calculations of the annual wage are based on Bry (1960). Occasionally published lists of applicants for shares exist, for instance the list of the first buyers of shares of Deutsche Bank in 1870 (see: Pohl (1987), or Bol (2018b), who analyzes the ownership structure of Deutsche Bank over time). The study of Pohl is without an analysis of investors' characteristics. First qualitative and quantitative studies of individual investor´s behaviour in a historical context, were recently published by Chambers et al. In a series of papers, they explore the investment behaviour of John Maynard Keynes between 1921 and 1946 (see: Chambers and Dimson (2013), Chambers et al.

the lists of shareholders attending the shareholders' meeting of different companies. The first, by Franks et al. (2006) investigates the ownership structure of German corporations from the 1880s to the 1950s, using 19 shareholder lists from 18 different companies listed on the Frankfurt and Munich stock exchange. They find evidence that in the first decade of the 20th century on average, 31.5 shareholders attend the meeting, holding nearly 70 percent of the capital of the firms (Franks et al. 2006, pp. 557, 563, 578). While they were the first to use shareholder lists in an empirical analysis, they fail to investigate the home bias and do not look at available information on, for example, the place of residence of the shareholders.

Following the approach of Franks et al., a second, empirical analysis of investors' home bias in Imperial Germany was carried out by Burhop and Lehmann-Hasemeyer (2016). They explore the geography of stock market listings in Imperial Germany in 1913 and distinguish between two forms of home bias. First, they find evidence for a home bias of companies' listing decisions on certain stock exchanges. Aside from the Berlin stock exchange (the biggest stock exchange in Germany at that time), regional stock exchanges like Augsburg, Stuttgart or Munich also played a major role in listing decisions. Smaller firms tended to get listed at regional stock exchanges, whereas larger firms with higher capital requirements tended to list at the Berlin stock exchange. The distance from the companies' headquarters to the stock exchanges played a major role in these listing decisions. The closer the companies' headquarters to a stock exchange, the higher the probability of being listed at this stock exchange. They explain their findings with asymmetric information between issuer and investor, and a home bias of investors investing more in well-known regional markets. In a second step, they demonstrate the home bias for the financial capital, Berlin, for a small sample of 32 shareholder lists from

(2015), Accominotti and Chambers (2016) or Chambers and Kabiri (2016).

16 different companies. They show that for companies based in Berlin, about 60 percent of shareholders representing about 60 percent of the capital also lived in Berlin, concluding that local investment was important and that something like an investors' home bias existed. In another study of the same period, Wormser (1919) shows that in Prussia, 30 percent of the financial wealth was concentrated in three cities (Berlin, Frankfurt and Cologne).

Rutterford et al. (2017) explore local investment bias in the UK from 1870 to 1935. Using a representative and unbiased database of nearly 30,000 shareholders based on 197 sets of share records, they present evidence of a strong local investment preference among investors. This home bias remained strong for London investors and declined for non-London investors over time. They explain their findings of local investment preference of investors with relation to the size and the age of the firm, and also with local informal trust networks between the investors and the directors of the firm. To describe investors' home bias in the first half of the 20th century, I follow the pioneering work of Franks et. al. (2006) and Burhop and Lehmann-Hasemeyer (2016). I use a larger dataset with more observations to give a clearer picture of investors' home bias. I also analyze a sub-sample to avoid and to reflect on the potential problems of a selection bias in the data towards people who live close to a meeting location.

4.2 Data Sources on Investors and Descriptive Statistics[8]

My analysis is based on 504 shareholder lists of attendance from 175 different companies. The investigation period starts in 1898 and ends in 1934. I collected data on individual firms from the Hessian Economic Archive (Hessisches Wirtschaftsarchiv), the Bavarian Economic

[8] For a detailed description and discussion of the data see chapter 2 of this dissertation.

Archive (Bayerisches Wirtschaftsarchiv) and the Baden-Wuerttemberg Economic Archive (Baden-Württembergisches Wirtschaftsarchiv), as well as from the Historical Archive of the Deutsche Bank AG and from the Historical Archive of the Commerzbank AG. The data includes filings of the Frankfurt Stock Exchange, the Munich Stock Exchange and the Stuttgart Stock Exchange. The 175 observed companies are not exclusively listed at the above-mentioned three stock exchanges. There are also listings at the Berlin, Hamburg, Cologne, Düsseldorf, Essen, and Augsburg stock exchanges. The data is available because under the Stock Exchange Act of 1896 companies were legally bound to submit shareholder information to their stock exchange operator. Companies also disclosed their prospectuses, an extract of the register of commerce, current company status, annual management reports, and lists of shareholders attending the general assembly. For example, if the general assembly voted to increase or reduce equity, this information had to be provided to the stock exchange operator.[9] I extract the name of the company, the industrial sector, the location of headquarters, the stock exchanges on which the company's shares were listed and the place where the general assembly took place. From the shareholder data, I take the name and title of every shareholder and his, her or its city of residence. In addition, I calculate the distance between company headquarters and the residence of every single shareholder, to obtain a distance measure allowing for the identification of the home bias. For all shareholders the address was reported down to city level, and those shareholders in the town center were located. The distances are as the crow flies.

In the vast majority of cases, however, these hand-collected databases of shareholder information are incomplete due to different protocols and layouts, which strongly limits the

[9] For the main legislative changes that occurred in the regulation of German capital markets in the 19th and 20th century see for instance: Franks et al. (2006, pp. 542ff., 554f.).

number of usable observations. In many cases, only the name and residence of the shareholders were reported without moreover any information on occupation or branch of the shareholder. In some cases, the address was left blank. Another bias in the data is that the information only includes investors attending the meetings or general assemblies. Those investors who did not attend the assemblies remain unknown. In addition, many investors were represented in these meetings and assemblies, for example by banks or bank directors. In many cases, there is only information on the authorized representative, but not on the represented investors. There is also no data on how shareholders exercised their voting rights, only information on how many votes were cast. Outliers and missing values have been removed from the data set.

Table 4.1, panel (a), reflects the sectoral distribution of the listed firms in my sample grouped into three time periods: 1889-1911; 1912-1923 and 1924-1934. The branches are divided into ten categories: banking, insurance, mining, heavy industry, light industry, food processing, transportation, chemical industry, public utilities and diverse. A lot of bank shareholder information is contained in the sample, so the banking sector is well represented. The highest percentage of firms comes from the light-industrial sector. This category includes textiles, paper, glass and rubber. Furthermore, as category six (food processing) illustrate, a large number of breweries are represented in the sample. Mining and heavy industry are under-represented.

Table 4.1, panel (b), highlights the total number of shareholders per firm in an industry based on the shareholder attendance lists in my sample. The total number of shareholders per firm in an industry is 9,651.[10] As already shown in panel (a), shareholders in the banking, light industry and food processing sectors are highly represented. To see whether the sample

[10] This is not identical to the actual individual number of investors, as it happened that investors held shares of different companies at the same time and therefore were present at several general meetings over time.

of listed firms is representative or not, I compare it to the actual number of the listed firms per sector listed on the Berlin stock exchange and the regional stock exchanges in 1913, as documented by Burhop and Lehmann-Hasemeyer (2016). This reveales that the sample is not representative. However, the analysis below still works, as having a representative sample is not essential. With 9,651 observations, the dataset seems suitable for analyzing local investment biases in more detail. Despite the possible shortcomings of the descriptive analysis, studying the characteristics of individual investors in this period remains a good starting-point to understand investors' decisions and the development of the German stock exchanges in general.

Table 4.1: Sectoral Distribution of Listed Firms and Shareholders, 1898 - 1934

	Panel (a)			Panel (b)		
	Number of firms in percent (total number)			Total number of shareholders per firm in an industry		
Industry	1898 - 1911	1912 - 1923	1924 - 1934	1898 - 1911	1912 - 1923	1924 - 1934
Banking	21.0 (5)	4.0 (4)	11.0 (12)	303	315	802
Insurance	-	3.0 (3)	4.0 (5)	-	149	852
Mining	8.0 (2)	4.0 (4)	5.0 (6)	24	96	615
Heavy Industry	-	8.0 (8)	6.0 (6)	-	236	77
Light Industry	25.0 (6)	32.0 (34)	24.0 (26)	112	1,086	759
Food Processing	17.0 (4)	14.0 (15)	11.0 (12)	55	624	636
Transportation	4.0 (1)	3.0 (3)	4.0 (4)	90	37	145
Chemical Industry	4.0 (1)	2.0 (2)	2.0 (2)	19	14	95
Public Utility	8.0 (2)	9.0 (10)	15.0 (16)	30	281	706
Diverse	13.0 (3)	21.0 (23)	18.0 (20)	197	776	520
Total	100.0 (24)	100.0 (106)	100.0 (109)	830	3,614	5,207

Notes. The heavy industry category contains: engineering firms, metal working, railway requirements; light industry contains: textile sector, paper industry, glass industry, rubber industry; food processing contains: breweries and mills; public utility contains: electricity, gas and water; diverse is divided into hotel companies, terrain companies and land banks.
Source. Own calculations using data from Hessian, Bavarian, Baden-Wuerttemberg Economic Archive, Historical Archive of the Deutsche Bank AG and from the Historical Archive of the Commerzbank AG, see also Appendix of chapter 4.

4.3 Descriptive Analysis of Investors Home Bias

Table 4.2 provides information regarding the distance between the residence of the investors and the company headquarters in which they held shares. The findings reveal a home bias over the whole period from 1898 to 1934. About 60 percent of the shareholders lived an average of 30 kilometers away from the company headquarters in question. About 65 percent lived within 50 kilometers of the company and about 73 percent lived within 100 kilometers of the company. This tendency also holds for the three sub-periods.

Table 4.2: The Regional Distribution of Investors 1898-1934 (Distance Between Company Headquarters and Investors' Place of Residence in km per Period)[a]

		Share of investors, who reside within 30, 50 and 100 kilometers of the headquarters (in percent)			Share of investors, who reside > 100 kilometers from headquarters (in percent)
Period	Observation	30 km	50 km	100 km	> 100 km
1898 - 1934	9,651	60.0	65.0	73.0	27.0
1898 - 1911	713	58.0	59.0	74.0	26.0
1912 - 1923	3,562	67.0	70.0	78.0	22.0
1924 - 1934	4,965	55.0	62.0	68.0	32.0

Source. Own calculations using data from Hessian, Bavarian, Baden-Wuerttemberg Economic Archive, Historical Archive of the Deutsche Bank AG and from the Historical Archive of the Commerzbank AG, see also Appendix of chapter 4.

[a]Running the analysis with the larger dataset leads to almost identical results. In order to save space, the analysis of this data is reported in the supplementary material A to this chapter.

Figure 4.1 and Figure 4.2 display the regional distribution of shareholders of different companies located in Berlin, Frankfurt (Main), Munich and Stuttgart. Companies located in these four cities are those with the highest number of shareholders in my sample, which provides a better picture of the regional distribution of the investors.[11] I calculate the distance

[11]The data provides 1,268 shareholders for companies from Berlin, 434 shareholders for companies from

between the investors' place of residence and company headquarters. The latter are marked with an arrow. The different places of residence of the shareholders are illustrated by grey circles. The bigger the grey circles, the more shareholders residing in the respective city.

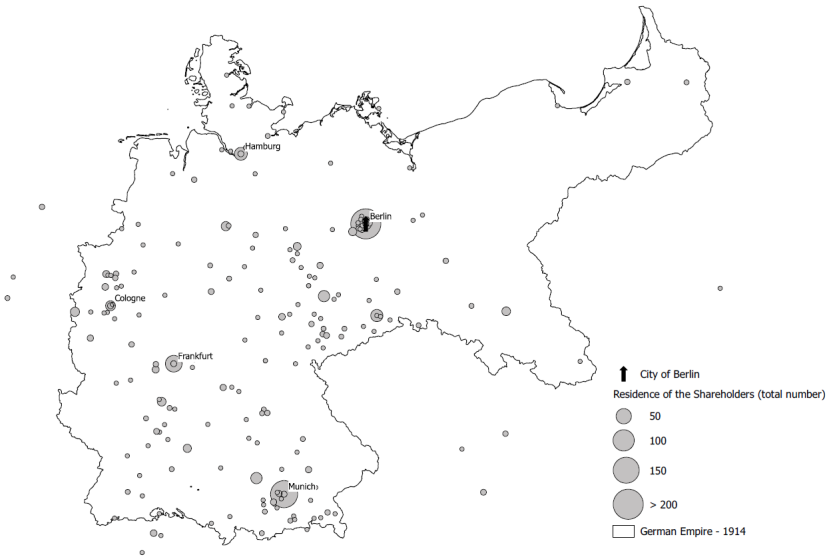
For companies with headquarters in Berlin, there is a wide distribution of the distance between investors' place of residence and headquarters. About 42 percent of the investors had their place of residence within 100 kilometers of the Berlin headquarters. A distance over 100 kilometers can be found in the case of about 68 percent of the investors. The result is not surprising, because Berlin was the financial center of Germany in the first half of the 20th century and the leading industrial city. This attracted many industrial companies, so that large, national companies with stock market listings at different stock exchanges had their headquarters in Berlin and operations throughout Germany. This led to a high number of non-regional investors, because the firms attracted share capital from across Germany (Lehmann-Hasemeyer and Burhop 2014). The picture for Frankfurt, in Figure 4.1, is different. About 88 percent of the investors had their residence within 100 kilometers of companies with headquarters in Frankfurt, with 12 percent of investors living more than 100 kilometers away. The results clearly reflect local investment behavior in the case of shareholders in Frankfurt. This is surprising, because Frankfurt was considered a financial center for southwest Germany, and foreign companies, especially from Austro-Hungary, were traded at the Frankfurt stock exchange. Frankfurt was also seen as a market for many regional firms which were located around Frankfurt, suggesting that there would be many regional shareholders. This is indeed suggested by the distributional graph. Munich and Stuttgart were considered regional centers, hosting the share registries of regional firms. For example, many Bavarian firms such

Frankfurt (Main), 1,692 shareholders for companies from Munich and 444 shareholders for companies from Stuttgart.

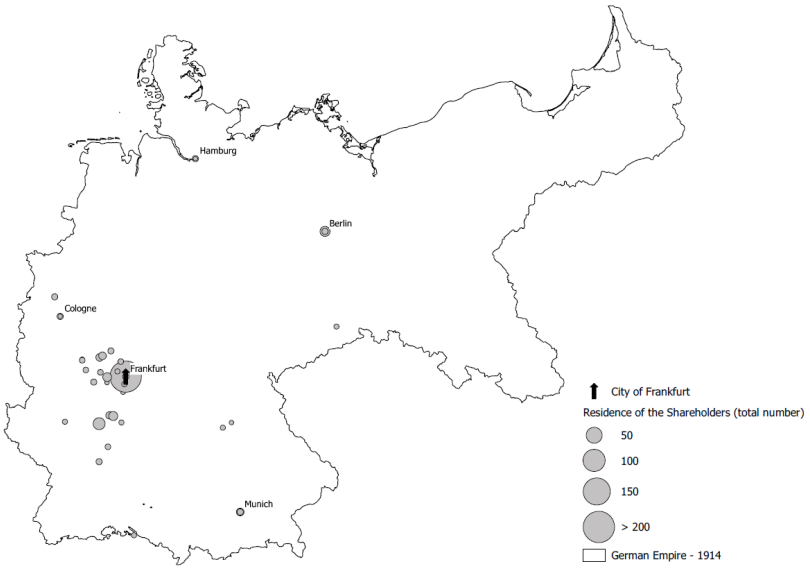
as breweries listed their shares in Munich. In Stuttgart, the firms were mainly from Wuerttemberg, which can be seen in Figure 4.2. About 82 percent of the investors in Munich-based companies also resided in Munich or within 100 kilometers of Munich. About 18 percent of the investors lived more than 100 kilometers away. For Stuttgart about 75 percent of investors lived within the 100-kilometer range, and 25 percent lived outside that range.

Table 4.3 can be read alongside Figure 4.1 and Figure 4.2. It shows the regional distribution of investors of the four different cities, Berlin, Frankfurt, Munich and Stuttgart.

I distinguish between three types of shareholders. Local shareholders, residing in the same place as company headquarters, regional shareholders, residing within 100 kilometers of company headquarters and non-regional shareholders, residing more than 100 kilometers from company headquarters. For companies based in Berlin, about 37 percent of shareholders also lived in Berlin. About 6 percent came from cities within 100 kilometers of Berlin and the highest proportion, 57 percent, lived more than 100 kilometers away.



(a) City of Berlin

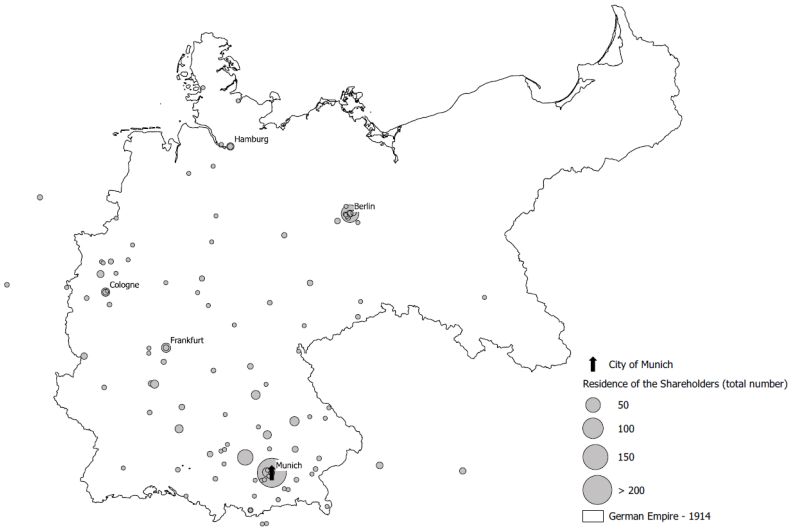


(b) City of Frankfurt

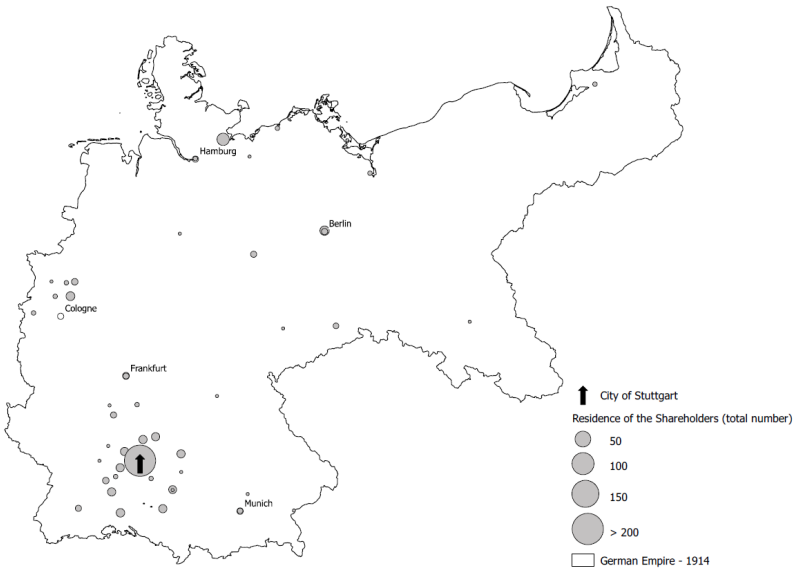
Notes. Own illustration. The maps depict the German Empire with the state borders of 1914. These examples are for illustration purposes. I'm aware that the border demarcations changed during my analytical period 1898-1934.

Source. Various, see Appendix of chapter 4.

Figure 4.1: Regional Distribution of the Number of Shareholders of Berlin and Frankfurt, 1898-1934



(a) City of Munich



(b) City of Stuttgart

Notes. Own illustration. The maps depict the German Empire with the state borders of 1914. These examples are for illustration purposes. I'm aware that the border demarcations changed during my analytical period 1898-1934.

Source. Various, see Appendix of chapter 4.

Figure 4.2: Regional Distribution of the Number of Shareholders of Munich and Stuttgart, 1898-1934

Table 4.3: The Regional Distribution of Investors 1898-1934 (Companies from Berlin, Frankfurt, Stuttgart, Munich)

	Company headquarters			
	in Berlin	in Frankfurt	in Stuttgart	in Munich
Residence at the base of the company (local investor)	37.0	62.0	46.0	74.0
From other places (<100km)	6.0	26.0	29.0	7.0
From other places (>100km)	57.0	12.0	25.0	19.0

Note. The depiction of the table is following Burhop and Lehmann-Hasemeyer (2016, p. 434).

Source. Own calculations using data from Hessian, Bavarian, Baden-Wuerttemberg Economic Archive, Historical Archive of the Deutsche Bank AG and from the Historical Archive of the Commerzbank AG, see also Appendix of chapter 4.

What proportion of share capital was owned by shareholders living in the same city as the headquarters of listed companies? This question is difficult to answer, because most shareholder lists provide incomplete information on the capital represented in the meetings and general assemblies. For companies based in Stuttgart, only eight shareholder attendance lists, covering three firms, provide complete information on the share capital. For those companies, I find that on average about 60 percent of the capital was represented at the meetings. Moreover, about 75 percent of the shareholders who attended the meeting also lived in Stuttgart. For companies based in Frankfurt, the picture looks similar. Only four attendance lists of two different firms provide complete information about share capital. Using this information, I find that 80 percent of the shareholders representing about 45 percent of the share capital at the meetings lived in Frankfurt. Using the same information for companies from Munich, about 70 percent of the share capital was represented at the general assemblies, with about 68 percent of the shareholders coming from Munich. Using the available information of seven attendance lists of four Berlin-based companies, about 69 percent of the shareholders representing about 45 percent of the share capital also lived in Berlin. These findings support the results of Table 4.3 and Figure 4.1 and Figure 4.2, showing an investors' home bias for investors in companies based in Frankfurt, Stuttgart and Munich.

Table 4.4 shows the regional character of the Frankfurt, Stuttgart and Munich stock exchanges in more detail by looking only at firms that were listed at those three stock exchanges. A distinction is made between firms with headquarters in Frankfurt, Stuttgart or Munich and those located outside these cities. In addition, a further distinction is made between shareholders residing close to the company, shareholders residing in Frankfurt, Stuttgart or Munich and shareholders from other places. Shareholders from other places are separated into

shareholders residing within 100 kilometers and shareholders residing more than 100 kilometers away. For firms located in Frankfurt, I find that 68 percent of the shareholders also lived in Frankfurt. About 21 percent lived within 100 kilometers of Frankfurt, and 11 percent lived more than 100 kilometers away. For firms located outside Frankfurt, 37 percent lived close to the company. Moreover, about 6 percent of the shareholders lived in Frankfurt. A further 20 percent of the other shareholders resided within 100 kilometers and 37 percent of the shareholders were non-regional. Regarding firms located in Stuttgart, only 19 percent of the shareholders also lived in Stuttgart. About 81 percent lived within 100 kilometers, showing clearly the regional character of the Stuttgart stock exchange. For firms located outside Stuttgart, 23 percent lived close to the company and about 24 percent of the shareholders lived in Stuttgart, 28 percent of the other shareholders resided within 100 kilometers and 25 percent of the shareholders were non-regional.

The picture for the Munich stock exchange is similar. Firms with headquarters in Munich had 75 percent of their shareholders also living in the city. About 7 percent lived within 100 kilometers of Munich and 18 percent lived more than 100 kilometers away. Firms with headquarters outside Munich had 48 percent of the shareholders living close to the company and about 7 percent lived in Munich, 24 percent of the other shareholders resided within 100 kilometers and 21 percent of the shareholders were non-regional.

Table 4.4: The Regional Distribution of Investors 1898-1934 (Companies Listed at the Frankfurt, Stuttgart or Munich Stock Exchanges)

	Company headquarter					
	outside Frankfurt	in Frankfurt	outside Stuttgart	in Stuttgart	outside Munich	in Munich
	Proportion of shareholders					
Residence at the base of the company (local investor)	37.0	68.0	23.0	19.0	48.0	75.0
From Frankfurt, Stuttgart, Munich	6.0		24.0		7.0	
From other places (<100km)	20.0	21.0	28.0	81.0	24.0	7.0
From other places (>100km)	37.0	11.0	25.0	0.0	21.0	18.0

Note. The depiction of the table is following Burhop and Lehmann-Hasemeyer (2016, p. 434).

Source. Own calculations using data from Hessian, Bavarian, Baden-Wuerttemberg Economic Archive, Historical Archive of the Deutsche Bank AG and from the Historical Archive of the Commerzbank AG, see also Appendix chapter 4.

Table 4.3 and Table 4.4, as well as Figure 4.1 and Figure 4.2, show that local investors were important in Germany in the first half of the 20th century.

However, these findings have to be treated with caution as the analysis is based on attendance lists which only include information on shareholders attending the meetings. Hence, my results may be challenged as the findings might be biased. There is no information on investors who did not attend the meetings, and investors living close to the meeting location were more likely to attend meetings than those living further away. For this reason, I decide to carry out a sub-sample analysis on companies that held their general assembly at a location other than headquarters.

4.4 Sub-sample Analysis: Location of Headquarters Differs from Location of General Assembly

The idea behind this section is as follow: If the general assembly took place at or close to the company headquarters, investors living close by were more likely to be those attending the meeting. To be more precise, the presence of an investors' home bias could be biased due to this. Therefore, it is more accurate to look at companies that held their general assembly at a place other than their headquarters. For example, if the firm's headquarters was in Berlin and the general assembly was held in Frankfurt, an investors' home bias would suggest that mostly investors from Berlin and its surrounds would attend the meeting. Thus, I analyze only those companies that held their general assembly somewhere other than their headquarters. The results are in Table 4.5. The sample includes in total eight companies based in eight different cities with 813 shareholders who were present at the general assembly. I calculate the distance between the headquarters and the location of the general assembly and distinguished between

companies with headquarters within 100 kilometers of the general assembly and companies with headquarters more than 100 kilometers from the general assembly. The stock exchanges on which the companies were listed at the time of the general assembly are also included. Furthermore, the regional distribution of the investors is reflected by a calculation of the distance between headquarters and investors' place of residence. I distinguish between investors residing within 30, 50, 100 and more than 100 kilometers of headquarters. The upper part of Table 4.5 analyzes four companies which held their general assembly within 100 kilometers of their headquarters: The Bleicherei, Färberei und Appreturanstalt (BFA) in Uhingen; the Vereinigte Kapselfabriken AG in Nackenheim; the Hanfwerke Füssen-Immenstadt AG based in Füssen and the Rheinische Stahlwerke based in Duisburg-Meiderich. The general assembly of BFA Uhingen took place in Stuttgart, about 31 kilometers from its headquarters; the general assembly of the Vereinigte Kapselwerke AG was held in Frankfurt, about 33 kilometers from its headquarters; the general assembly of the Hanfwerke Füssen-Immenstadt AG was held in Kaufbeuren, 35 kilometers from its headquarters and the general assembly of the Rheinische Stahlwerke was held in Essen, 18 kilometers from its headquarters.

First of all, the analysis of the upper part shows that the investors' home bias holds for these four companies. Mostly regional investors residing within 100 kilometers of headquarters attended the general assemblies. For example, in the case of the BFA Uhingen 79.2 percent of the shareholders resided within 30 kilometers of headquarters (and 85.7 percent within 50 kilometers and 86 percent within 100 kilometers). Non-regional investors were the exception. Only 14 percent of the shareholders in BFA Uhingen lived more than 100 kilometers away. The results are very similar for the other three firms, emphasizing the role of regional investors.

The picture differs for those companies holding their general assembly more than 100 kilometers from headquarters (see bottom part of Table 4.5). Here the regional distribution of the shareholders of the following four companies is illustrated: Klöckner-Werke AG located in Berlin, Mannesmannröhren-Werke based in Düsseldorf, and Zuckerfabrik Offstein and Commerz- und Diskontobank in Plauen.

If headquarters were more than 100 kilometers away, it seems that the investors' home bias vanishes. The results indicate that the majority of investors no longer come from the area near headquarters and that the share of regional investors is smaller. Moreover, it seems that in this case the investors resided near the location of the general assembly, which is indicative of a high share of non-regional investors. For example, in the case of the Klöckner Works about 72 percent of the shareholders came from places more than 100 kilometers away and only 18 percent can be seen as regional investors. The same holds even more for Commerz- und Diskontobank where only one percent of shareholders lived near the branch office in Plauen and 99 percent resided near Hamburg, where the shares were also listed.

Table 4.5: The Eight Companies Holding Their General Assemblies at Locations Other Than Headquarters

Company	Headquarter	Place of the general assembly	Distance headquarters - general assembly (in kilometers)	Number of investors	Stock exchange where the firms were listed	Share of investors, who reside within 30, 50 and 100 kilometers to the headquarters (in percent)			Share of investors, who reside > 100 kilometers away from headquarters (in percent)
						30 km	50 km	100 km	> 100 km
Headquarters within 100 km									
Bleicherei, Färberei und Appreturanstalt	Uhingen	Stuttart	~ 31 km	246	Stuttgart	79.2	85.7	86.0	14.0
Vereinigte Kapselfabriken AG	Nackenheim	Frankfurt a.M.	~ 33 km	85	Frankfurt a.M.	38.8	97.6	99.0	1.0
Hanfwerke Füssen-Immenstadt AG	Füssen	Kaufbeuren	~ 35 km	84	Augsburg, Frankfurt a.M., Munich	13.1	66.6	95.0	5.0
Rheinische Stahlwerke	Duisburg	Essen	~ 18 km	98	Frankfurt a.M., Berlin	64.2	72.4	83.0	17.0
Headquarters > 100 km									
Klöckner-Werke AG	Berlin	Duisburg	~ 471 km	97	Berlin, Essen, Hamburg, Cologne, Düsseldorf, Frankfurt a.M.	27.8	27.8	18.0	72.0
Mannesmannröhren Werke	Düsseldorf	Berlin	~ 478 km	83	Berlin, Frankfurt a.M., Hamburg, Cologne, Düsseldorf, Essen, Munich	24.0	39.7	42.0	58.0
Zuckerfabrik Offstein	Offstein	Hannover	~ 325 km	65	Munich, Berlin, Frankfurt a.M.	24.6	33.8	42.0	58.0
Commerz- und Diskontobank (office Plauen)	Plauen	Hamburg	~ 370 km	55	Berlin, Hamburg, Frankfurt a.M.	1.0	1.0	1.0	99.0

Source. Own calculations using data from Hessian, Bavarian, Baden-Wuerttemberg Economic Archive, Historical Archive of the Deutsche Bank AG and from the Historical Archive of the Commerzbank AG, see also Appendix chapter 4.

Now the question arises why the companies held their general assemblies at a place other than headquarters. One reason might be the location of the stock exchange where the companies were listed. A firm located close to Stuttgart with listings at the Stuttgart stock exchange might be more likely to hold the general assembly in or near Stuttgart. This approach applies to all eight companies. For example, Hanfwerke Füssen-Immenstadt AG had listed its shares at the Munich, Augsburg and Frankfurt stock exchanges and held its assembly nearer to the Bavarian stock exchanges in Kaufbeuren. Similarly, Vereinigte Kapselfabriken AG from Nackenheim held the general assembly in Frankfurt, because the shares were listed at the Frankfurt stock exchange. The same holds for Mannesmannröhren Werke, which was located in Düsseldorf but also listed at the Berlin stock exchange.

This result suggests a new form of home bias: a "stock exchange home bias of investors". It seems that it was not only important for an investor to be located near to company headquarters and thus get easier access to firm-specific information and the latest news, but also to be located near the stock exchange where the shares were listed. Better access to, and understanding of, the local stock exchange seems to have influenced the investment decision. There appears to be an information advantage to living near the stock exchange. Investors may have benefitted from interaction and conversations with other traders, stockbrokers or bankers and they may have had better access to information about the stock exchange.

Another important point is that companies had the important goal of attracting new capital by issuing new shares on other stock exchanges. Holding general assemblies in alternate financial centers improved the prospects of attracting new capital (Burhop and Lehmann-Hasemeyer 2016).

4.5 Conclusions and Further Research

I provide data on shareholder information based on attendance lists of general assemblies in order to study local investment biases. The descriptive analysis first shows that local investors were clearly important. A very high number of shareholders lived within 100 kilometers of the company headquarters in which they held shares. In many cases, shareholders lived in the same city as company headquarters. However, these findings seemed biased because the lists examined here were mostly attendance lists. It seems likely that the probability of attending a meeting was higher for investors residing near to the location of the general assembly. For example, the probability of attending a meeting in Stuttgart was higher for investors from Stuttgart than for investors from Berlin. The analysis of different sub-samples then reveals a different picture. The home bias does not hold for those companies that organized their general assembly in a place other than headquarters. This might be because companies were trying to attract new capital by issuing new shares on other stock exchanges. My analysis reveals another form of home bias, which has not yet been considered. It seems that it was no longer important where company headquarters were located. Moreover, it seems that the location of the stock exchange mattered and whether the company in which the investors held shares was listed in that location.

Looking beyond these findings, this article has made several contributions. First, it narrows the gap in our knowledge of investors in historical periods, providing evidence for and a description of a home bias. Second, it shows another form of investors' home bias. The location of the stock exchange affected the investment decision. Thus, the stock exchange on which the shares were listed was important. Third, it can be presumed that previous studies of local investors in Germany in the first half of the 20th century overestimated this effect.

Further research has to deal with two issues. First, other sources, such as shareholder books[12] or portfolios of individual investors[13] should be utilized. The advantage of these sources is that the information on shareholder characteristics would be independent of the shareholder attending the general assembly, which would eliminate the problem of investors' attendance at meetings. It might be possible to get a clearer picture of investors' home bias using these kind of sources. Second, the reasons for an investors' home bias should be investigated closely. According to Merton, one key variable in investing is the local character of information: "Investors buy and hold only those securities about which they have enough information" (Wójcik 2011, p. 70). Before investing, the investor has to know something about a company. Consequently, willingness to invest in the shares is higher among those investors with more information about a firm. For instance, the probability is higher that investors from Stuttgart have better knowledge giving them an informational advantage of the firm-specific characteristics of a firm located in Stuttgart, than non-local investors. Local investors can use different sources of information: they can talk to employees of the firm; they have access to information from local newspapers; they possibly know the products and services of the company better, and they may benefit from the interaction with other local investors.[14]

Given the communication and transport technology in the period examined, such informal, local knowledge would have been much more valuable than today. In this sense the information advantage of local investors was even larger than it is today. However, it should be noted that due to the introduction of the telegraph and telephone, information costs for investors were also falling. In addition, financial papers like the Berliner Börsenzeitung were

[12] For the analysis of home bias using three shareholder books see supplementary material B and C to this chapter.

[13] For the analysis of an individual portfolio see chapter 5 of this dissertation

[14] For a recent literature review, see Wójcik 2011, pp. 72ff. as well as Lindblom et al. 2017, pp. 143ff.

founded, which also reduced information costs (Weigt 2005, p.20). Nevertheless, the information advantage of local investors remained. So the presence of an investors' home bias might have been driven by asymmetric information between issuer and the investors. Moreover, it seems plausible that investors located nearer to the stock exchange had an advantage regarding information on the stock exchange and their transactions processes. Anecdotal evidence about the Amsterdam stock exchange provided by de la Vega relates that it was normal practice for many investors to go to the stock exchange from day-to-day doing their business (de La Vega 1994, pp. 136ff.). Of course, there was the possibility of being represented by stockbrokers or bankers, but this was costly (Weigt 2005, pp. 17ff.). It made sense for investors to buy shares that were traded at their closest stock exchange, to avoid information asymmetries and reduce information costs.

4.6 Supplementary Material A: Investors' Home Bias Using the Broader Sample

As a supplementary material, I conduct the home bias analysis with a broader sample, since I had collected additional lists of shareholders attending general assemblies.

Table 4.6 provides the results, using about 7,000 observations more than before. I calculate the distance between the residence of the investors and the company headquarters in which they held shares for the different time periods. I first use the same six time periods as in section 4.3 of this chapter. Regarding the period from 1869 to 1945, on average, 55.78 percent lived within 30 kilometers of the company headquarters. About 62 percent of the shareholders lived an average of 50 kilometers away from the company, and about 68 percent lived within 100 kilometers of the company, whereas about 32 percent lived more than 100 kilometers away.

This tendency also holds when using the same four time periods (1898–1934/1889–1911/1912–1923/1924–1934) as in section 4.3. The findings confirm the results of Table 4.2 and show a home bias over the whole period from 1898 to 1934, as well as for the different sub-periods. Compared to Table 4.2, the numbers are only slightly different. In Table 4.6, for the period from 1898 to 1934, on average, 70 percent of the shareholders lived within 100 kilometers and about 30 percent lived more than 100 kilometers away of the company's headquarters. This is slightly lower than in Table 4.2, but still reveals the investors' home bias (in Table 4.2, 73 percent lived within 100 kilometers and 23 percent more than 100 kilometers away).

Table 4.6: The Regional Distribution of Investors (Distance Between Company Headquarters and Investors' Place of Residence in km per Period)

		Share of investors, who reside within 30, 50 and 100 kilometers of the headquarters (in percent)			Share of investors, who reside > 100 kilometers from headquarters (in percent)
Period	Observation	30 km	50 km	100 km	> 100 km
1869 - 1945	16,356	55.78	61.41	61.41	31.18
1869 - 1913	2,801	59.69	67.01	76.58	23.42
1914 - 1923	5,025	64.82	68.70	76.60	23.40
1924 - 1928	4,377	52.11	55.20	60.13	39.87
1929 - 1933	2,865	47.61	58.43	66.21	33.79
1934 - 1945	1,288	42.55	48.45	56.99	43.01
1898 - 1934	15,426	56.83	62.33	69.64	30.36
1898 - 1911	2,378	59.88	66.06	75.53	24.47
1912 - 1923	5,328	64.94	69.20	77.05	22.95
1924 - 1934	7,720	50.30	56.44	62.71	37.29

Source. Own calculations using data from Hessian, Bavarian, Baden-Wuerttemberg Economic Archive, Historical Archive of the Deutsche Bank AG and from the Historical Archive of the Commerzbank AG; see also Appendix of chapter 4.

4.7 Supplementary Material B: Investors' Home Bias of the Metallgesellschaft AG and the Metallbank und Metallurgische Gesellschaft AG

In this section, I use the two shareholder books of the MG and the Metallbank to conduct a further analysis of historical home bias. The advantage of these sources is that they are unbiased in terms of travel cost that might lead to a home bias toward people who live close to the meeting, as is probably the case when analyzing the shareholder lists of attendance (see chapter 4, section 4). A brief classification of the company is to be carried out before presenting the analysis of home bias.

On 1 January 1881, the Metallgesellschaft AG (hereafter referred to as MG) was founded in Frankfurt/Main by Wilhelm Merton, Leo Ellinger and Wilhelm Merton's father, Ralph Merton.[15] The purpose of the newly founded MG was the trading and production of metals. Wilhelm Merton was mainly responsible for all the business strategies, whereas Ellinger was responsible for operations and the cousin of Merton, Zachary Hochschild, for marketing activities. Thus, the key positions were in the hands of family members or long-time loyal friends.

At the end of the 19th century, the MG became more and more involved in the international metal markets, since Europe and Germany became more reliant on important metals. Therefore, Merton's intention was to put the existing trading activities on a broader basis and to supplement them with other business fields to be able to also internationally trade metal.

For this reason, the Metallurgische Gesellschaft AG (hereafter referred to as Lurgi) was founded in 1897. The aim was to bundle the industrial activities in a subsidiary of the MG.

[15] For the text of the history of the Metallgesellschaft AG and Metallbank und Metallurgische Gesellschaft AG, see Däbritz (1931, pp. 61ff.); Knetsch (1998, pp. 23ff.); Weichel (2000, pp. 148ff.) and Reichel (2008, pp. 27-71).

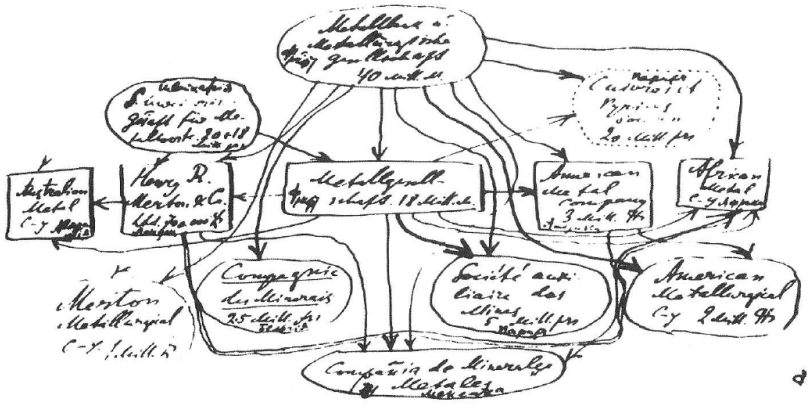
The purpose of the Lurgi was mainly mining and the extraction, the processing and the use of metals. The MG and the Lurgi developed very well over time and expanded into foreign companies and participations. Therefore, in 1906, the incorporate bank of the MG, the so-called Berg und Metallbank AG, was founded by Wilhelm Merton, since these expansions had to be financed and the expanding MG had high capital procurements. Merton intended a division of labor with respect to trade (MG), industry (Lurgi) and finance (Berg- und Metallbank AG).

Due to its numerous investment companies and subsidiaries in all major industrialized countries, the MG controlled a significant portion of the global metal trade. A first attempt to graphically depict the organizational form of the MG was carried out by Robert Liefmann in 1913 (Liefmann 1913, p. 120.). Figure 4.3 shows the organizational form by Liefmann in a handwritten organizational chart by Wladimir I. Lenin. Lenin came across the remarks on the organizational chart of Liefmann and traced them by hand.[16]

Over the years and due to further growth of the MG, it has become clear that a complete separation between industry (Lurgi) and finance (Berg- und Metallbank AG) was not practical anymore. Consequently, in 1910, there was a merger between the two companies to the Metallbank und Metallurgische Gesellschaft AG (hereafter referred to as Metallbank) to avoid duplication of work.

The First World War hit the MG and the Metallbank hard. Thereafter, it lost a large part of its foreign participations. After the break-up of the foreign raw material base, the metal company initially turned to the domestic processing sector.

[16] For detailed discussion of the organizational form of the Metallgesellschaft AG, see also Knetsch (1998, pp. 227ff.).



Source. Reichel (2008, p. 49). A printed organizational chart can also be found in Knetsch (1998, p. 233).

Figure 4.3: The Group of the Metallgesellschaft AG—Handwritten Organizational Chart by Wladimir I. Lenin

In the mid-twenties of the 20th century, the business situation of the MG improved considerably. In the international expansion, it reached a similar extent as it had before the First World War. Nonetheless, to streamline the organization, the MG and the Metallbank merged in 1928. From then on, the company traded as Metallgesellschaft AG. The leadership of the company remained in the hands of the founding family. The sons of Wilhelm Merton, Alfred and Richard, hold the chair of the management as well as the supervisory board.

Regarding the first shareholder book of the MG in 1919, I measure home bias by again calculating the distance between the corporate headquarters of the MG in Frankfurt/Main and the investors' residences since these are the main usable data. Figure 4.4 shows that about 83 percent of the investors lived within 100 kilometers of the companies headquarter, whereas only 17 percent were located farther away than 100 kilometers. The analysis of the distance clearly indicates a home bias. Nevertheless, this result has to be treated carefully because until

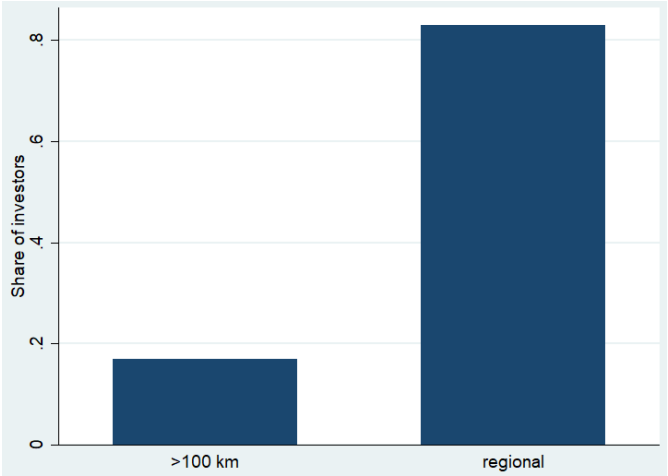
1922, the MG issued only registered shares that could not be bought and traded on the stock market (Reichel 2008, p. 28). Reichel (2008) states that until 1922, most of the shares lay in the hands of the founding family, close friends of the founding family, within the MG concern itself and in the hands of industrial participations (Ibid.). Thus, the probability is high that many investors lived in close proximity to the MG because they were employees or close friends of employees of the MG. Therefore, the results are not representative and an interpretation of the investment behavior is difficult. This becomes even more clearer when checking the entries and names in the shareholder book. First, the names belong to the founding family, like the families of Merton, Hochschild and Ellinger. Second, many of the investors were employed at the MG, like e.g. Eduard Zintgraff, Otto Fellner or Eduard Ladenburg.[17] Moreover, the institutional investors in the book are all from the MG concern itself, e.g. industrial participations like the Schweizerische Gesellschaft für Metallwerte. The result that 17 percent of the investors lived further away than 100 kilometers of the headquarter of the MG in Frankfurt/Main is driven due to the location of the foreign investors. Since the foreign investors lived in most cases near the foreign industrial holdings and participations of the MG, it still indicates the importance of the MG on the metal markets even in foreign countries.

Therefore, to evaluate home bias in more detail, I concentrate on the second shareholder book of the Metallbank because it also shows the portfolio of the investors. For a detailed description of the shareholder book, see chapter 2.

As mentioned in chapter 2, it remains unclear who bought the shares and who opened the accounts. However, to proceed, a crucial assumption has to be made. I am assuming that the investors listed in the book opened their accounts on their own and also bought

[17] For a further overview, see Appendix.

their shares on their own, whereas the Metallbank acted as an intermediary in the process of buying the shares. To evaluate the home bias, first of all, the theory and the hypothesis have to be provided.



Source. Own calculations, using HWA 119/392.

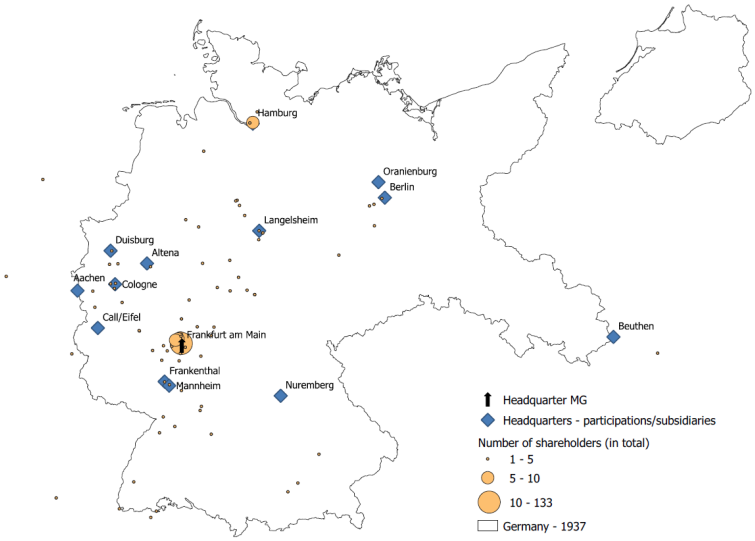
Figure 4.4: Distance Between Corporate Headquarters and Investors' Residences (in Percent)

For the theory, I follow Wójcik (2011, p. 71), who cites Merton (1987): "Investors buy and hold only those securities about which they have enough information." Thus, the willingness to invest in the shares is higher among those investors, who know the firm's characteristic better. Local investors can use different sources of information, like e.g. they can talk to employees of the firm; they have access to information from local newspapers; they possibly know the products and services of the company better; and they may benefit from the interaction with other local investors. Therefore, firms are more recognizable to local investors than to non-local ones. The geographic distance as a proxy for the local character of information is a very important variable that is highlighted in many papers (Hau 2001; Grinblatt, Mark, and

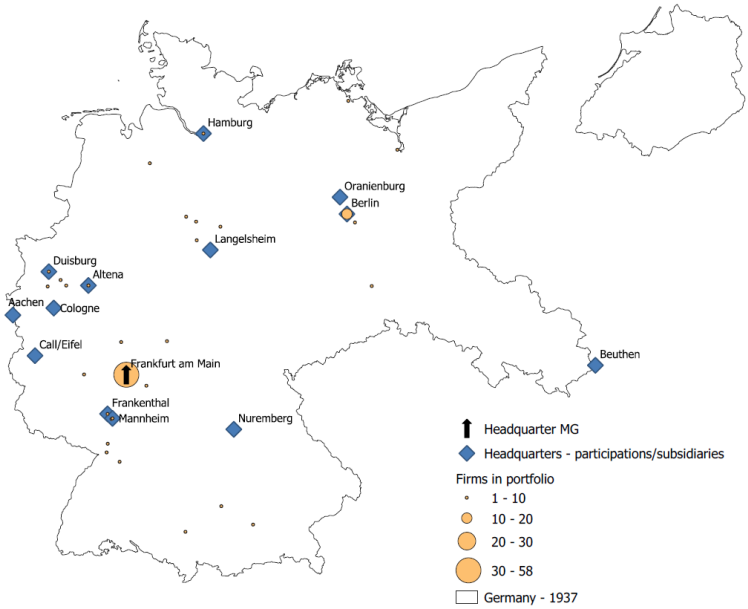
Matti Keloharju 2001; Grote et al. 2002; Seasholes and Zhu 2010; Bernile et al. 2015). The underlying hypothesis is that these information asymmetries increase with distance. Thus, the home bias that investors tend to buy shares of local companies simply reflects these information asymmetries.

As a starting point, I first calculate the distance between the headquarter of the Metallbank and the residents of the shareholders to get an impression of the regional distribution of the investors. About 46 percent of the investors lived within a range from 0 to 10 kilometers of the headquarters. About 19 percent lived within a radius of 10 to 50 kilometers of the headquarters, and 3 percent lived within an area of 50 to 100 kilometers away from the headquarters. About 30 percent of the shareholders were located more than 100 kilometers away. What is striking is that many investors either lived close to the headquarters of the Metallbank, resided in near proximity to the branches of the Metallbank or were domiciled near to the industrial participations and holdings of the MG and Metallbank (especially the foreign investors). Figure 4.5 highlights this for the German investors. The figure encompasses three parts. In the first part, the headquarters of the Metallbank is marked with a black arrow. Second, most of the important German industrial holdings and branches of the MG and the Metallbank are highlighted as diamonds. And third, the residents of the shareholders are depicted as dots.[18] In fact, the Metallbank did not just have regional investors, but rather the non-regional or foreign investors were still all German, or at least, the names sound German. For example, the foreign investors came from London, Melbourne, New York, Mailand, Wien and Amsterdam. The probability is high that they lived in these cities because the MG operated from there. Also, the firms that show up at

[18] A detailed list of the industrial holdings can be find in the Appendix.



(a) Regional Distribution of the Investors of the Metallbank



(b) Firms that at least show up in one investor's portfolio

Source. Own illustration, using HWA 119/393.

Figure 4.5: Regional Distribution of the Investors of the Metallbank

least in one investor's portfolio are not particularly regional. Moreover, they are closely located to the Metallbank or to industrial holdings of the Metallbank, as shown in Figure 4.5.

The descriptive pattern indicates that the possibility is high that there is a home bias to the headquarters of the MG in Frankfurt/Main and to the locations of the branches of the MG. What is interesting is whether there is a home bias within the investors' portfolios referring to the fact that local investors also buy shares of local companies.

After showing the descriptive patterns, I conduct the home bias analysis by using different empirical methods. The observational unit is at the level of every single investment i in the portfolio of investor c of the Metallbank. For the analysis, I only consider the investment in stocks. The first empirical approach (columns (1) to (4)) is estimating the following OLS model:

$$\begin{aligned} Homebias_{i_c} = \alpha + \beta' Geography_{i_c} + \gamma' InvestorsCharacteristics_c \\ + \delta' StockCharacteristics_{i_c} + \lambda' Politics_{i_c} + \mu_{i_c} \end{aligned} \tag{4.1}$$

where two different dependent variables $Homebias_{i_c}$ are used. First, I calculate the value of regional investments made by the investors. This means that the distance between the investor and the headquarters of firms that show up in the portfolio is less than 50 kilometers.[19] The second dependent variable is the above average investment in stocks made by every single investor in the shareholder book.[20]

There are different sets of independent variables. $Geography_{i_c}$ is a set of geographic char-

[19] A ratio that indicates the average investment in companies located within 50 kilometers to the investor.
[20] A ratio that indicates the above average investment. The variable has the mean of one.

acteristics of investment i of investor c. It includes the distance between the firm's headquarters that shows up in the portfolio and the investor's residence. Moreover, I use the information about whether the investor lives within a radius of 50 kilometers to the headquarters of the firms that shows up in the portfolio. $InvestorsCharacteristics_c$ is a set of independent variables that contains information about the characteristics of investor c. It includes whether the investors have a doctorate or whether the investors are male, female or institutional.

Third, $StockCharacteristics_{i_c}$ is a set of indpendent variables that include information about the number of stocks in investor's portfolio and the number of stock exchanges on which the stocks are traded. Last, some political indicators $Politics_{i_c}$,like whether there is a state border between the firm's headquarters and investors' residences, are included as control variables.

The second empirical approach (columns (5) and (6)) estimates the following logit model F:

$$P(INVESTMENT_{i_c} = 1) = F(\alpha + \beta' Geography_{i_c} + \gamma' InvestorsCharacteristics_c + \delta' StockCharacteristics_{i_c} + \lambda' Politics_{i_c} + \mu_{i_c}) \tag{4.2}$$

where the dependent variable $INVESTMENT_{i_c}$ of investor c is used. The dependent variable takes the value 1 if the stock in the portfolio is listed on the closest stock exchange, and 0 otherwise. For the control variables, I include the distance of the investor to the closest stock exchange and whether the stock exchange is located within 50 kilometers of an investor's

residence. The rest of the control variables are the same as in the first estimation procedure.

Table 4.7 shows the result of the OLS (model (1) to (4) and logit regression (5) and (6)), where the observation is on the level of the investment and only the German-based investors in the shareholder books are considered. It shows that there is a negatively significant relationship between the distance of the firm's headquarters that shows up in the portfolio to the investors and the value of investment in regional firms. The higher the distance between the firm and the investors, the lower the regional investment (column (1)). If an investor lives within 50 kilometers of the firm's headquarters, the value to invest in regional firms is significantly higher (column (2)).

If the distance between the headquarters of the firm in the portfolio and the investor is higher, than the average investment of a single investor is significantly lower. If an investor lives within 50 kilometers of the firm's headquarters, the average investment of a single investor is significantly higher (columns (3) and (4)).

Column (5) and (6) refer to the fact that also the location of the stock exchange could matter for the investment decision. If the distance between the residence of the investors to the closest stock exchange is higher, than the probability that this stock is listed at this respective closest stock exchange is significantly lower. If the stock exchange is within 50 kilometers of an investor, then the probability is higher that this stock is also listed at this respective stock exchange (model (8)).

According to the results of Table 4.7, it seems that home bias decreases with the distance of the investors to the headquarters of the firms. The more local the investors are, the higher the interest in local shares. In some cases, the firms that show up in the portfolio were also investors of the Metallbank itself, which makes it clear that there was an information

Table 4.7: Regression Results, Investors' Home Bias (German-based Investors)

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variables	Value of investment in regional firms (<50 km to investor)		Above average investment of single investor		Stock is listed on the closest stock exchange	
Estimation	OLS				Logit regression	
Distance between investor and firm's headquarters	-0.000639**		-0.000755**			
	(8.94e-05)		(0.000305)			
Investors live within 50 km of the firm's headquarters		0.347***		0.196*		
		(0.0433)		(0.104)		
Distance from investor to the closest stock exchange					-0.0154***	
					(0.00418)	
Stock exchange within 50 km of an investor						1.770***
						(0.536)
Investor has a doctorate	-0.127*	-0.135**	-0.0196	-0.0485	-0.178	-0.278
	(0.0647)	(0.0626)	(0.0472)	(0.0389)	(0.599)	(0.602)
Male investor (vs. institutional)	-0.00382	0.00337	-0.0365	-0.0114	-0.687	-0.498
	(0.0749)	(0.0736)	(0.0449)	(0.0428)	(0.599)	(0.577)
Female investor (vs. institutional)	-0.0377	-0.038	0.0193	0.0155	-0.182	-0.272
	(0.0649)	(0.0655)	(0.0349)	(0.0337)	(0.623)	(0.593)
Number of stock exchanges in investor's portfolio	-0.0203***	-0.0203***	-0.00115	-0.000744	0.0454**	0.0490***
	(0.00477)	(0.00472)	(0.00204)	(0.00187)	(0.0193)	(0.0187)
Number of stock exchanges on which the stock is traded	-0.00186	-0.00388	0.0265	0.0195	0.529***	0.471***
	(0.00501)	(0.00482)	(0.0162)	(0.0162)	(0.11)	(0.0912)
Investor and firm are in different states	0.03	0.0432	-0.0273	-0.0224	-1.091***	-1.214***
	(0.0387)	(0.0395)	(0.0792)	(0.077)	(0.386)	(0.397)
Observations	228	228	228	228	232	235
R-squared	0.313	0.505	0.052	0.033		

Notes. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. All regressions included a constant which is not reported.

advantage. Investors prefer shares of local companies because they have more relevant information about these companies. Moreover, the shares of local companies are traded on local stock exchanges, about which local investors are better informed.

Also the fact that shares were often held by the founding family of the company, close friends of the manager of the company, and employees might explain the observed home bias of the shareholders of the Metallgesellschaft.[21]

As a further point, the question often arises of why such a decentralized system of financial centers existed in Germany with its multiple regional stock exchanges and large network of banks with a large number of branches. There is already some contribution to that question by Klagge and Martin (2005), who compare the decentralized German system of stock exchanges and the centralized system in the UK in 1996 and 2001 and argue that regional markets have an important information and network function between regional firms and national markets and therefore are necessary in terms of efficiency. In addition, Arnold et al. (1999, p. 1085) argue that regional stock exchanges were important for local firms because they tended to list their new shares at regional stock exchanges. Lehmann (2014) argues that large universal banks (D-banks) during this time often worked closely with smaller regional private banks. For example, the smaller local banks often did not have the necessary size, market power, connections or branches at the stock exchange and could thus not organize their customers' IPOs by themselves, so the large banks placed the shares for the local banks. The regional banks thereby played an important intermediary role in the underwriting process because they had reliable information about local firms, which was also valuable for the larger banks.

[21] This finding is also in line with the study of Rutterford et al. (2017). They find an increasing home bias among those investors who have trust networks with the respective managers or company directors.

Related to this, financial theory suggests bundling stock trading in one place to increase liquidity and prices. According to this, investors might have the incentive to centralize their trading activities because this reduces information and transaction costs. But in reality, this is not the case (Amihud and Mendelson 1986).

This analysis might also contribute to the question of why such a decentralized system of financial centers existed. This should not be highlighted too much because the analysis comes with some crucial assumptions. One may argue that the Metallbank as a regional financial center reduces information asymmetries for these local investors and thereby increases liquidity of firms that tend to list on the stock exchange. This might also explain why many firms listed on more than one stock exchange.

4.8 Supplementary Material C: Investors' Home Bias of the Mittelschwäbische Überlandzentrale AG

This section analyzes the investment behavior of the shareholders of the Mittelschwäbische Überlandzentrale AG (MÜAG) in more detail and evaluates whether there is a home bias effect of investors. After providing a short history classification of the company, i will show the results of the analysis.

The Mittelschwäbische Überlandzentrale Giengen AG[22] (hereafter referred to as MÜAG) was formed in 1920 by a merger of two electricity companies: the Elektrizitätswerk Genossenschaft für die Heidenheimer und Ulmer Alb from Heuchlingen, which was founded in 1908, and the Elektrizitätswerk für das Bach- und Egautal from Bachhagel founded in 1909. The former name of the MÜAG was Überlandwerke Heuchlingen-Bachhagel eGmbH and it was

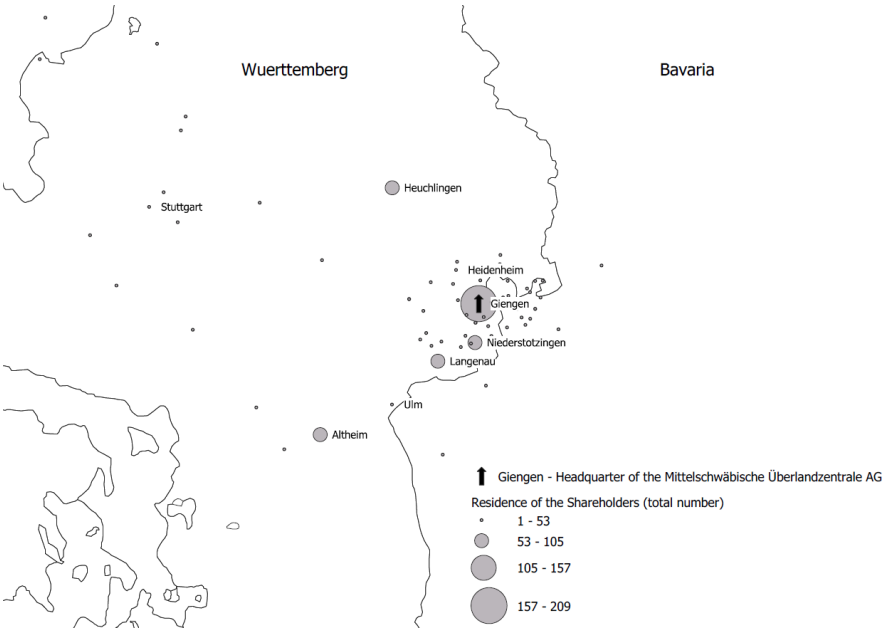
[22] For the text of the history of the Überlandzentrale AG, see Überlandzentrale AG (1958, p. 10ff.).

based in Giengen an der Brenz. The supply area was comprised of 19 Bavarian and 4 Wuerttemberg communities. As the supply network continued to grow, the company needed funding. Therefore, in 1923, the company finally went public and was converted into an AG. In 1924, the name was changed to MÜAG. The power supply was directed mainly to the city of Stuttgart and the resident state water supply, as well as their area. For this purpose, the new high-voltage transmission line from Niederstotzingen-Untertürkheim was used. In 1919, the power stations in Gerstetten, Giengen and Steinheim were taken over, and from the 1920s, the electricity was purchased mainly from the interconnected grid. From 1932, water companies were brought into the company to increase production capacity. The coverage at the time of the Second World War was about 50 percent. After the war, the out-of-town plants outside the utility were no longer economically viable. These were sold, and the electricity was from 1973 about 98 percent of the Energieversorgungservice GmbH (EVS) and two percent from private hydroelectric power plant. The EVS GmbH bought more and more shares of the MÜAG, so that they held, around the year 1998, 85.2 percent of the shares. In 1999, the MÜAG was merged with the Überlandwerk Jagstkreis AG to form the present-day Ostwürttemberg Donau Ries AG and the Energie Baden-Württemberg (EnBW).

Because the MÜAG was a regionally based company that supplied mostly the region with electricity, the hypothesis is that the company had a mostly regional shareholder structure with shareholders coming from the surrounding areas. To figure out whether there was an investors' home bias, I calculate the distance (as the crow flies) between the investors' residences and the headquarters of the company. As mentioned in chapter 2, the analysis should be treated with caution, because in total, only 25 percent of the shareholders are considered. Figure 4.6 and Table 4.8 depict the regional distribution of the shareholders.

Figure 4.6 supports the hypothesis and graphically shows that many investors came directly from the city of Giengen, where the headquarters was located. Moreover, many investors came from the surrounding area of Giengen. They lived in Heuchlingen, Niederstotzingen, Langenau and Altheim. In cities such as Ulm and Heidenheim, investors also had their residences, but much fewer than in the four cities mentioned above.

This is also in line when one looks at Table 4.8. Panel A shows that about 93 percent of the investors lived within 100 kilometers of the headquarters in Giengen. Only 7 percent lived more than 100 kilometers away. This is a strong positive correlation between the residence of the investors and the proximity to the headquarters of the MÜAG. The smaller the distance to the company, the higher the number of investors. It seems that most shareholders have entered the company with their capital to support a regional company, since the MÜAG was well known among the people in the region.



Source. Own illustration, WABW B2007/649.

Figure 4.6: Regional Distribution of the Shareholders of the MÜAG

Because the location of the stock exchange also mattered for investing, Panel B calculates the distance between the residence of the investors and the Stuttgart stock exchange, where the shares of the MÜAG were all listed. Here also one finds a clear home bias with respect to the Stuttgart stock exchange. About 90 percent of the investors lived within 100 kilometers of the Stuttgart stock exchange.

To sum it up, and only looking at 25 percent of shareholders of the MÜAG, the data clearly show that mostly investors from the area in and near Giengen bought shares. This is also confirmed by the fact that the shares were only traded on the Stuttgart stock exchange. Regarding the MÜAG, the probability is high that regional companies that listed their shares at regional stock exchanges also have a regional shareholder structure. To provide a generalization of this

argument, further research needs to be done.

Table 4.8: Regional Distribution of Investors of the Mittelschwäbische Überlandzentrale AG in 1925

Panel A: Distance between company's headquarters and investors' place of residence in km				
	Share of investors, who reside within 30, 50 and 100 kilometers of the headquarters (in percent)			Share of investors, who reside > 100 kilometers from headquarters (in percent)
Observation	30 km	50 km	100 km	> 100 km
1,319	79.23	87.49	92.57	7.43

Panel B: Distance between the Stuttgart stock exchange and investors' place of residence in km				
	Share of investors, who reside within 30, 50 and 100 kilometers of the headquarters (in percent)			Share of investors, who reside > 100 kilometers from headquarters (in percent)
Observation	30 km	50 km	100 km	> 100 km
1,319	79.23	87.49	92.57	7.43

Source. WABW B2007/649.

5

Does the Preference for Investment in Local Firms Rise in Turbulent Times? Evidence From the Portfolio of Joseph Frisch, Private Banker (1923-1955)*

*This chapter is co-authored with Sibylle Lehmann-Hasemeyer (University of Hohenheim). The candidate's individual contribution focused mainly on the hand-collection and processing of the data and the literature research. The empirical analyis and the writing was split equally between the authors. An earlier version of this chapter appeared in Zeitschrift für Unternehmensgeschichte 2019/1, pp. 1-18, (Lehmann-Hasemeyer and Neumayer 2019). URL: https://www.degruyter.com/view/j/zug.2019.64.issue-1/zug-2018-0007/zug-2018-0007.xml. DOI: https://doi.org/10.1515/zug-2018-0007. It is printed with kind permission of Walter de Gruyter GmbH, Berlin/Boston.

The preference for local investments is well-known. The home bias literature shows that investors prefer assets from their home country and home region to a diverse portfolio of domestic and foreign assets. Although home bias has been documented in previous centuries, (Burhop and Lehmann-Hasemeyer 2016 or Neumayer 2018) factors that determine the degree of the home bias were not studied before 1945. Explanations for modern economies have drawn on individual psychological biases, different institutions and cost structures, and information asymmetries.[1] Nicolas Coeurdacier and Hélène Rey (2013, pp. 68ff.), for instance, look at a number of explanations such as hedging motives, asset trade costs, and informational and behavioral biases. Still, although part of the preference for local shares can be attributed to psychological or sociological factors, another part can certainly be explained by economics. The contribution of information asymmetries seems particularly compelling.[2] In the 19th and early 20th centuries, it was much easier to obtain information about firms that were closer to investors. These information asymmetries may have had significant economic consequences. News about a change in fortunes for a firm would reach neighbors sooner than investors, who were further away and dependent on other sources of information. Local investors had a clear advantage in being able to buy or sell shares ahead of a change in the share price. The harder it was to get reliable, timely information, the greater the advantage of local investors.

We have a new and unique source of data, the private portfolio of a Stuttgart private banker, Joseph Frisch[3] which enables us to study home bias in the years 1923 to 1955. Frisch made his first documented transaction when he was 42 years old and the last one shortly be-

[1] For an overview of the literature, see Coeurdacier and Rey (2013) or Wójcik (2011).

[2] For an overview of recent studies regarding information asymmetries, see Lindblom et al. (2017, pp. 141ff.).

[3] Depotbuch des Bankhauses Joseph Frisch und des Bankhauses Joseph Frisch Nachfolger, 1923-1957, Wirtschaftsarchiv Baden-Württemberg (hereafter WABW, B166/268).

fore he died at the age of 72. We, therefore, study his investment decisions within this period. To our knowledge, this is the longest time series of individual investment decisions that has been analyzed with a focus on the preference for local shares. David Chambers et al. recently published the first qualitative and quantitative study of an individual investor's behavior with an equally long sample period. They study the investment behavior of John Maynard Keynes between 1921 and 1946; however, they do not analyze a particular preference for local shares but rather focus on his overall investment strategy.[4]

Our analysis reveals that Frisch's preference for local shares was correlated with the stock market. His home bias appears to increase in years in which the overall stock market experienced low returns or was in recession, particularly during the Great Depression. We also show that the home bias was significantly lower during the Nazi regime during which Frisch benefited greatly from the expulsion of his Jewish competitors from business life in Nazi Germany and the territories it controlled. With this novel case study, we show that the preference for local investments varies over time and is strongly correlated with economic circumstances. It also seems to be influenced by politically driven action.

5.1 Joseph Frisch – A Private Banker

In 1881, Joseph Frisch was born in Gaggenau in Baden. He married Emma Frisch (born Offermann) and had two daughters, Hertha and Irmgard, and six grandchildren, Bettina and Verena Meeh, and Angelika, August, Franz Claudius and Joseph Alexander von Demblin. Both Frisch daughters married into prosperous families. Hertha married director Walter Meeh, and Irmgard married Dr. Ing. Count Karl von Demblin, becoming the Countess von Dem-

[4]Chambers and Dimson 2013, Chambers et al. 2015, Accominotti and Chambers 2016 or Chambers and Kabiri 2016.

blin (Hesselschwerdt 2015, pp. Iff.).

In 1922, Joseph Frisch founded the private bank Joseph Frisch in Stuttgart, located in Königsstraße 19a. According to the entry in the commercial register, the merchants Eugen Zimmermann and Otto Essele were granted procuration. Owners and authorized representatives remained unchanged over 24 years, which was above average for this time (Hohmann 2009, pp. 312f.).

Joseph Frisch was one of many start-ups in the early 1920s. The fast devaluation overloaded the credit apparatus, and more than 40 new private banks were founded in Wuerttemberg between 1917 and 1925. Unsettled by inflation, more and more people sought advice from private bankers. This and the increased demand for equities brought customers and spurred economic growth for private banks. For most of the small private banks, however, the good times were short-lived. Joseph Frisch was one of the few houses to survive the hyperinflation and subsequent currency stabilization (Bergner 1993, pp. 204ff.).

The bank was ranked 121 in a list of the most important German private banks in 1933; however, when its main competitors – the Jewish banks – were liquidated, it rose to 22 on that list within five years (Ziegler 2003, p. 44). In 1949, Otto Essele became a partner, and the bank became a general partnership (Offene Handelsgesellschaft). After Joseph Frisch's death in April 1953 at the age of 72, his widow and both daughters joined the company as limited partners, so that leadership of the bank remained with the family. The limited partners resigned in March 1955 and united their interests in the Kapitalverwaltungsgesellschaft Zavelstein. Also in 1955, the name was changed to "Joseph Frisch Nachfolger", and the limited partnerships were replaced by the Kapitalverwaltungsgesellschaft Zavelstein. The business activities of the bank ended in 1965, and the company was dissolved in 1966. The Kapitalverwaltungsak-

tiengesellschaft Zavelstein, which in the meantime called itself Verwaltungsaktiengesellschaft Stuttgart, was dissolved in April 1978 (Hohmann 2009 or Heselschwerdt 2015). Thus, the bank founded in the early 1920s' boom survived hyperinflation, currency stabilization, the banking crisis in 1931, and the Second World War.

5.2 The Home Bias Related Literature and Hypotheses

Previous research has identified a large gap between what finance models predict for individual investment behavior and observed behavior (Merkle and Weber 2014, p. 372). As Harry Markowitz (1952) pointed out in the 1950s, portfolio theory assumes that investors form expectations about return and risk securities and select portfolios according to their expectations and risk preferences (see also Merkle and Weber 2014, p. 372). Economically rational actors should diversify portfolios and trade very little. However, at least in modern periods, private investors have held under-diversified portfolios (Goetzmann and Kumar 2008). There is also evidence that investors trade too frequently (Odean 1998 or Barber and Odean 2000), take high idiosyncratic risks (Calvet et al. 2007), gamble, and speculate (Kumar 2009).

The 'home bias' phenomenon is a further contradiction between model predictions and observed behavior. Kenneth R. French and James M. Poterba explain the over-weighting of home securities in the portfolio by institutional factors such as income taxes that favor a certain home bias, which would raise the cost of investment abroad. However, they do not find significant evidence for these kinds of institutional differences and emphasize the behavioral aspect of investment decisions. Investors tend to be risk-averse towards foreign investments because they believe they know the domestic market better (French and Poterba 1991). French

and Poterba's findings are consistent with other studies on the topic.[5] Ted Lindblom et al. (2017), for instance, also emphasize that home bias is a result of information advantages of local investors over non-local ones[6] and claim that investment decisions are somehow emotionally rooted.

Choi et al. (2017) test international diversification and find evidence that in situations of uncertainty, investors tend to hold a disproportionate share of familiar or well-known shares. They argue that investors who are sufficiently uncertain about foreign securities prefer shares with which they are familiar. The results confirm a higher profit for this strategy, which is also justified by information asymmetries.

Altogether, previous research of modern markets reveals that the home bias is influenced by the institutional setting, information costs that cause information asymmetries, and beliefs of investors that regional investments are less risky and, therefore, preferable in times of economic and political turmoil.

There have not been many studies on home bias in earlier periods. For Germany, Burhop and Lehmann-Hasemeyer (2016) analyze 32 shareholder lists from 16 different companies based in Berlin and showed that shareholders, who also lived in Berlin, owned about 60 percent of the share capital of these companies.[7] They concluded that local investment was important and that there is evidence for an investors' home bias. The authors further investigate

[5] For a comprehensive review, see Ian Cooper et al. (2013), who also focus on home bias.

[6] Coval and Moskowitz (1999) also call information asymmetries a significant factor in explaining domestic investment, but they expanded the concept of distance. First understood only as a purely geographical term, they introduce the term "economic distance". As an example, they measure the distance from Los Angeles to El Paso (Texas) to New York. Of course, El Paso (Texas) is geographically closer to New York, but the "economic distance" is much lower from Los Angeles to New York (e.g. better transport and communications infrastructures, such as railways or air links, or other similarities between the two cities). This "economic distance" is also clearly reflected in investors' portfolio decisions.

[7] Julian Franks et al. (2006) also analyze shareholder lists on a broader scale but do not study the home bias in particular.

home bias when it comes to listing decisions of companies at certain stock exchanges, finding that smaller firms were listed at regional stock exchanges whereas larger firms with higher capital requirements were listed at the Berlin stock exchange. They explain their findings with asymmetric information between issuer and investors and with the home bias of investors investing more in well-known regional markets.[8]

Neumayer (2018) studies the home bias based on a larger sample, showing that the home bias vanishes if the general meeting did not take place close to the headquarters of the firm. Moreover, it mattered to investors which stock exchange the shares were listed on.

For Britain, Janette Rutterford et al. (2017) explore local investment bias from 1870 to 1935. Using a representative database of nearly 30,000 shareholders based on 197 sets of share records, they present evidence of a strong local investment preference. This home bias effect remained strong for London investors and declined for non-London investors over time.

However, all the above-discussed historical studies deal with the description and determination of the home bias phenomenon with less focus on the reasons for home bias. This study seeks explanations for home bias across time by looking at Joseph Frisch's preference for local shares under four different economic and political regimes: The Weimar Republic, the Nazi regime, World War II, and the post-1945 recovery. We are interested in whether the home bias was influenced by economic circumstances, market performance, or Frisch's activity on the stock market. Moreover, we are also interested in whether and how the political regimes influenced the degree of his home bias.

It is relatively easy to study whether general economic circumstances influenced Frisch's bias towards regional investments. We measure the overall market performance with a stock

[8] Wormser (1919), a contemporary observer, further states that in 1919 in Prussia, 30 percent of the financial wealth was concentrated in three cities (Berlin, Frankfurt and Cologne).

market index and study the correlation between this index and Frisch's home bias. Studying the impact of the political circumstances is more difficult; thus, we compare the number of transactions and the share of regional investments of all investments in four different periods that probably influenced Frisch's investment decisions differently.

The first period, between 1924 and 1928, was a rather stable economy; thus, we expect the home bias to be relatively large at the beginning shortly after the hyperinflation and then to decline over time. With the onset of the Great Depression banking crisis in 1929, the home bias is likely to rise with a potential rise in information asymmetries and a preference for familiar firms in times of economic distress. In this period, we find that many private bankers financially supported regional companies that were traditionally associated with them. A well-documented case is the financial renovation of the Bamag-Meguin AG by the private banks Sal. Oppenheim and A. Levy (Ulrich 1998, p. 201).

After 1933, when the National Socialists took power, the 'Aryanization' process of Jewish private bankers offered extraordinary investment opportunities for 'non-Jewish' private bankers like Frisch.[9] The 'Aryanization' of the Salamander AG is a good example. Joseph Frisch was one of the bankers who sold shares, which were in possession of the family of the Jewish company founder Max Levi (James 2001, p. 86). Frisch was involved in many other 'Aryanization' transactions and was, in fact, considered a professional aryanizer ("gewerbsmäßiger Ariseur") (Finger et al. 2013, p. 244). Wixforth and Ziegler (1997, p. 219) further point out that Frisch gained importance after 1931 because he specialized in providing standstill funds ("Stillhaltegelder") to first-class industrial debtors. This resulted in 18 supervisory board mandates, which Frisch held in 1938. Thus, we expect a dramatic rise of Frisch's in-

[9] For a description of the ‚Aryanization' process of Jewish private banks, see, e.g. Köhler (2005).

vestment activities during the Nazi period, widening the regional range of activity (decrease of home bias), which came along with the 'Aryanization' process of Jewish private bankers. However, between 1933 and 1939, we expect the number of transactions to decline because of the National Socialists' policy to dry out capital markets. Overall, the relevance of stock exchanges was dramatically reduced in this period,[10] which can also be seen in revenue from the stock exchange tax that fell from 72 million Reichsmark in 1913 to 16 million Reichsmark in 1937/1938 (Henning 1992).

After World War II, the activities of banks were restricted, and until 1958, capital mobility was limited. Thus, lower overall activity is likely, which might be accompanied by a higher share of regional investments. On the other hand, the stability of the economy after 1945 and the rising number of investment opportunities might have caused the home bias to decline.

Furthermore, we expect strong path dependence over the whole time period because we assume that past experiences of investors have an impact on their investment behavior. In a seminal paper, Malmendier and Nagel (2011) find evidence that investors' risk attitudes are closely related to the returns experienced during their lifetime. Individuals who have experienced low returns on the stock market over their lifecycle are less willing to take financial risks. Formative experiences, such as the Great Depression, however, can still influence investment behavior decades later.

Age certainly has an impact on investment decisions, although we have no expectations in what way it influences the home bias. Malmendier and Nagel (2015) also investigate how individuals' subjective perceptions about future inflation rates are shaped. Their analysis

[10] In 1934, a law was passed that reorganized the structure of the German stock market. Overall, the number of stock exchanges was reduced from 21 to nine and firms were forced to de-list or list on the closest stock exchange. The law also made it harder to list on a stock exchange. For an overview, see Lehmann-Hasemeyer and Burhop (2014).

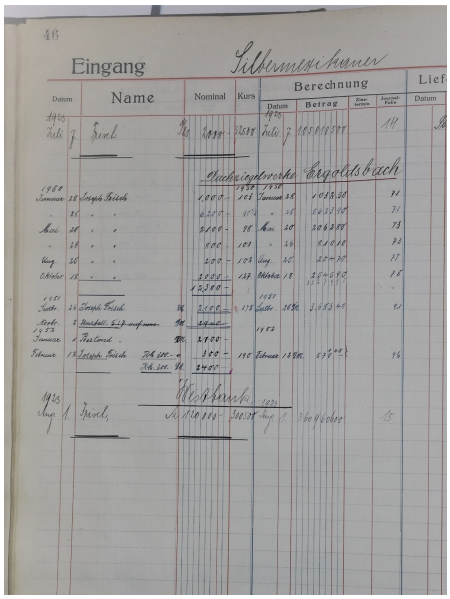
shows that experience of inflation over the course of a lifetime has a significant impact on inflation expectations. The authors explain the heterogeneity in the inflation expectations of the different age groups by using the experienced average inflation. Young people have less life experience compared to older people, so their expectations are mainly based on recent observations. Greenwood and Nagel examine the investment decisions of mutual fund managers during the technology bubble in the late 1990s to find out whether inexperienced investors contribute to bubble formation (Greenwood and Nagel 2009, pp. 239f.). Using managers' age as a proxy for their investment experience, they find that inexperienced managers are constantly expanding their investments as the bubble develops, while more experienced managers do not. Thus, more experience over time might reduce the home bias because information asymmetries decline. However, it is also possible that stable returns of regional investments and a rising risk aversion cause a rise in regional investments over time.

5.3 The Portfolio Over Time

The portfolio is in the Baden-Wuerttemberg Economic Archive (WABW B166/268) and is described as Depotbuch des Bankhauses Joseph Frisch und des Bankhauses Joseph Frisch Nachfolger (stock register).[11] It contains transactions of stock, bonds, and obligations for the period 1923-1955. The 190 pages of the book document more than 6,000 transactions, including the name of the stock or asset, the nominal value, the price, and sometimes the profit or the amount that was paid for the shares. Most transactions were carried out on behalf of Joseph Frisch, but there are some transactions for other parties, for example, the partner Otto Essele. The first recorded transaction took place a year after Joseph Frisch founded the

[11] WABW, B166/268. In the supplementary material to this chapter, I analyze investments of Gustav Schlott, who was an investor from the late 19th century.

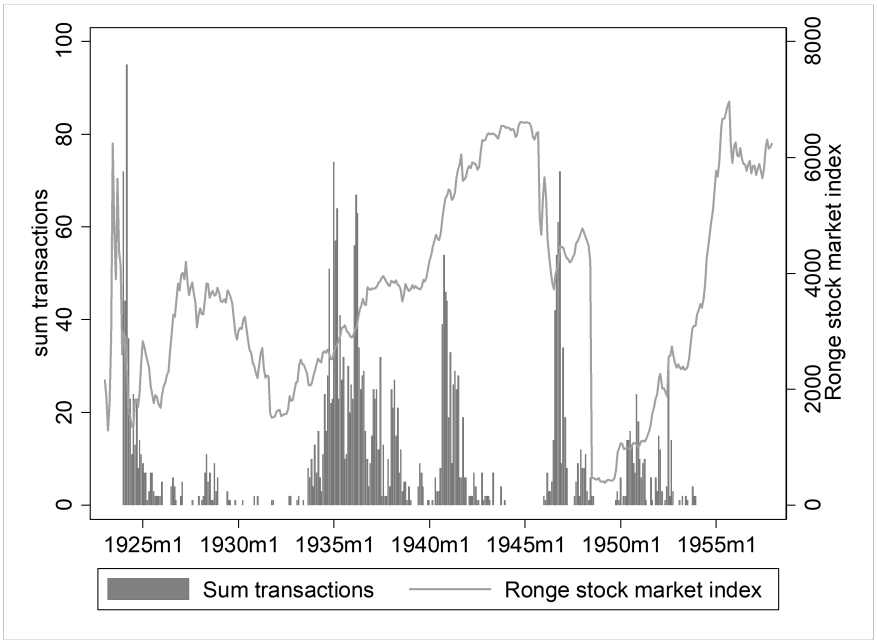
bank, at the age of 41, and they continued until his death. After 1953, there are some further transactions carried out by a successor, («Frisch Nachfolge»). The transactions are sorted by stock or asset and are handwritten. Figure 5.1 shows a page of the source. It remains unclear whether the portfolio is Joseph Frisch's private portfolio or a record of transactions by the bank. However, this is not relevant for our purposes, as the bank and the person, Joseph Frisch, cannot be separated. As stated above, prices and profits are not always available and are not always conclusive because different abbreviations were used for the units and currencies. It is therefore difficult to calculate the profits and losses accurately. We, therefore, focus only on the transactions and the relative volume of transactions and not on the profits or losses.



Source. WABW, B166/268.

Figure 5.1: Sample Page of the Source

Figure 5.2 shows all transactions, aggregated by month. It also provides the general performance of stocks using Ulrich Ronge's stock market index (Ronge 2002). The figure reveals that Frisch was constantly buying and selling shares over his life cycle but was, as we expected, more active in some periods than in others. His most active year was 1923 during the hyperinflation period when he made more than 800 transactions. He bought and sold shares within days and made great profits but also great losses. He regularly neglected to report losses or gains and often just gave rough (rounded) prices. In the 1920s, he traded very occasionally and started trading more when Hitler and the National Socialists took over in 1933. However, shortly before the outbreak of World War II, he traded less, probably because of the National Socialists' policy to dry out capital markets. After the war, he again traded regularly until his death in 1953. Transactions carried out by a successor continued until 1955.

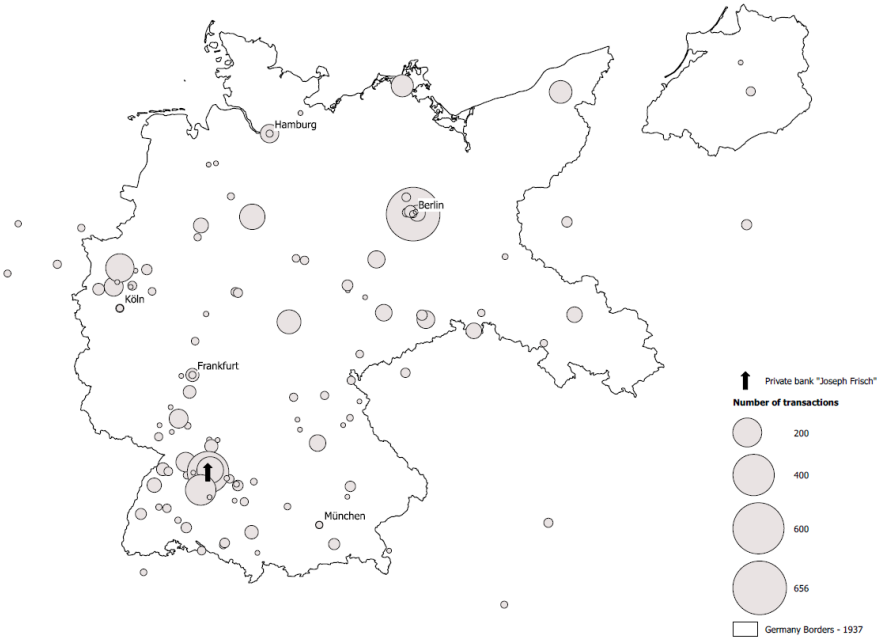


Source. Own calculations using WABW, B166/268 and the stock market index by Ronge (2002).

Figure 5.2: Overview of Transactions Over Time, Aggregated by Month

Overall, 42 percent of all investments were in firms within 100 km and about 33 percent within 50 km of Stuttgart. These included investments in regional electricity firms such as the Württembergische Elektrizitäts AG and in smaller firms such as the Wolldeckenfabrik in Weil der Stadt, a manufacturer of wool blankets, or the Andreas Koch Harmonica factory in Trossingen, which made harmonicas. Frisch also invested in large regional firms such as Daimler AG and Salamander AG. Many of the firms in his portfolio still exist and are known to have a strong and important influence on development in the region (Kollmer 1979 and Kollmer-von Oheimb-Loup 2005). However, a significant share of Frisch's investments was not regional, for example, he held shares in Mannesmann Röhrenwerke, IG Far-

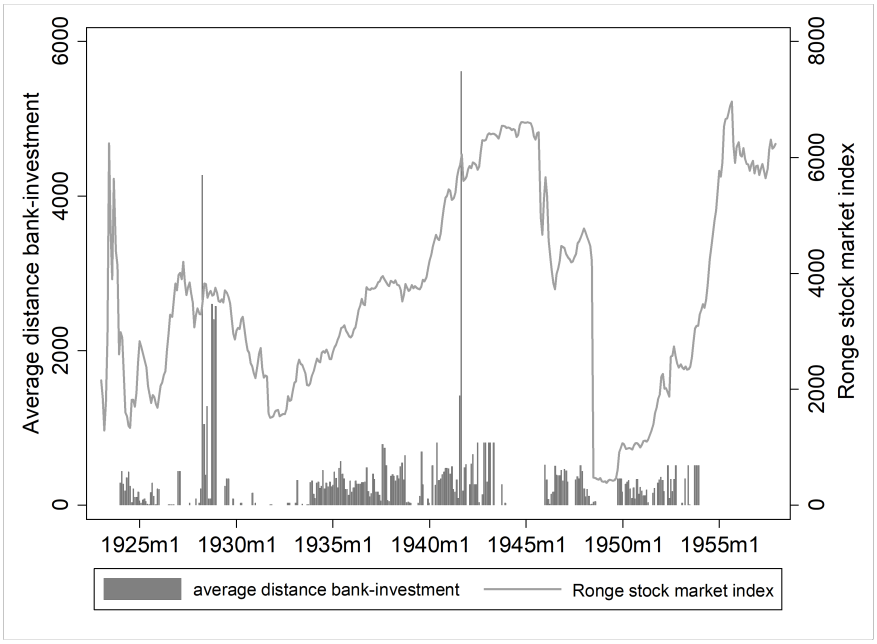
ben in Mannheim, and in many different railway companies. Figure 5.3 maps the distribution of all Frisch's transactions from 1923 to 1955, showing his investments in and around Stuttgart, throughout Germany, for example, in Berlin and the Ruhr area, and in firms from the Netherlands, Poland, and Czechoslovakia.



Source. Own illustration using WABW, B166/268.

Figure 5.3: Regional Distribution Transactions, 1923-1955

Figure 5.4 shows that Frisch's home bias varied over time. At first glance, it seems to be correlated to the overall stock market performance. In months in which the Ronge index indicates substantial returns, the average distance of Frisch's transactions also seems larger. However, we will study this relationship more closely below.



Source. Own calculations using WABW, B166/268 and the stock market index by Ronge (2002).

Figure 5.4: Average Monthly Distance Between Headquarters of Firms in Which Frisch Invested and Stuttgart

5.4 Explaining the Preference for Local Shares

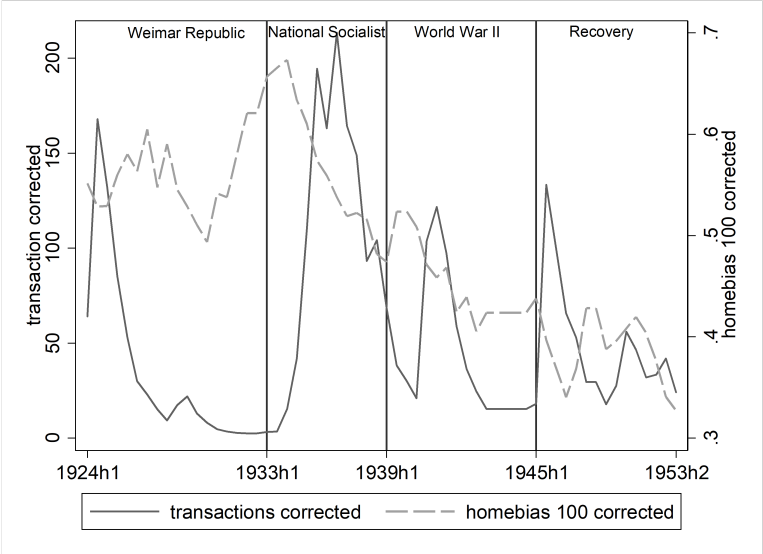
In order to perform a more elaborate analysis, we aggregate the time series to a half-year series, as there were no transactions in some months. We also omit the year 1923, as it was an exceptional year that would bias our results, and we exclude the few transactions that occurred after Joseph Frisch's death. Additionally, the distance variable is adjusted to prevent bias from transactions such as the 1928 purchase of shares in a Tennessee, USA based firm. Therefore, a more comprehensive variable is used to measure regional preference that is most commonly used in previous analyses (Wójcik 2011, p. 70). We calculate the share of invest-

ments in firms within 100 km of Stuttgart (home bias 100) of all transactions per year and a stronger home bias variable that only considers investments within 50 km of Stuttgart (home bias 50) of all transactions per year. We then use exponential smoothing to achieve stationarity. Exponential smoothing can be viewed either as an adaptive-forecasting algorithm or, equivalently, as a geometrically weighted moving-average filter.[12] The Dickey-Fuller test for unit roots reveals that the home bias time series and the transaction and stock market indices are stationary after the smoothing.

Figure 5.5 provides an overview of the transformed time series on the share of investments within 100 km of Stuttgart as well as the overall number of transactions, which fits our expectations very well. First, the corrected time series clearly shows that the home bias varied over time. It shows that the share of investments within 100 km of Stuttgart was relatively stable in the early years of the Weimar Republic and increased as expected after 1929 with the Great Depression. Frisch mainly bought shares of regional companies such as the Himmelwerke AG in Tübingen or the Friedrich Hesser Maschinenfabrik in Stuttgart, Bad Cannstatt, but we do not know whether this is caused by a rise in risk aversion or because he wanted to support his long-term clients. At the beginning of the Nazi regime, the regional bias diminished, and Frisch's overall investment activity increased, which supports our argument of 'Aryanization'. However, the number of transactions declined as we expected due to the Nazis' dislike of the stock market, which caused an overall decline in trading volume. The home bias also declined and remained stable during the war. After 1945, the overall number of transactions increased again but was far from earlier activities during the Nazi period, as most private banks were subject to strict property monitoring by the Allied administration

[12] Bowerman et al. (2005) provides an excellent introduction to single-exponential smoothing.

in these years. The home bias also slightly declined, but overall one can see that the scope of action was limited.



Source. Own calculations using WABW, B166/268 and the stock market index by Ronge (2002).

Figure 5.5: Corrected Time Series

Since all variables are stationary, we can test the impact of the overall market performance on the home bias variable with a simple OLS setting by estimating the following equation:

$$\begin{aligned} Homebias_t = \alpha + \beta_0 Homebias_{t-1} + \beta_1 Transactions_t + \beta_2 Ronge_t \\ + \beta_3 perioddummies_t + \epsilon_t \end{aligned} \tag{5.1}$$

where home bias and transactions cover the variables described above. Ronge is the stock market index calculated by Ulrich Ronge (2002). For the time variables, we use either period

dummies that are supposed to show structural changes between the different regimes or we use a time trend, since it seems that the home bias had a negative trend after 1933. ϵ_t is the error term. We estimate this regression with ordinary least squares and robust standard errors. The results are shown in Table 5.1. Overall, the regressions confirm our results. The first interesting thing to note is that the home bias was slow to change. If the share of regional investments was high in the previous six months, then it was also high in the following six months. This results fit well our hypothesis that investment decisions are determined by previous decisions (path dependence). Furthermore, the home bias declines over time, as Frisch grew older and more experienced. This supports the arguments given by Malmendier and Nagel (2011, 2015) and Greenwood and Nagel (2009).

Second, Frisch's preference for regional shares was significantly lower in periods in which the overall stock returns were higher and when he was active on the stock market. Thus, the general economic circumstances strongly influenced Frisch's bias towards local shares.

Third, there seems to be no significant difference in regional investments during the Weimar Republic, the Nazi regime, and World War II. The only significant difference is revealed for the years after 1945. Here the home bias was significantly lower in the years after 1945 when the economy recovered, and returns and growth were high. The lack of significance between the regimes is probably due to the fact that we observe changes within the regimes.

Table 5.1: Regression Results, Determinants of the Home Bias

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	homebias 100 (share of transactions within 100km of Stuttgart of all transactions per year)			homebias 50 (share of transactions within 50km of Stuttgart of all transactions per year)		
Homebias 100 lagged	0.809***	0.794***	0.590***			
	(0.103)	(0.137)	(0.167)			
Homebias 100 lagged (2 periods)			0.220			
			(0.153)			
Homebias 50 lagged				0.876***	0.900***	0.704***
				(0.0994)	(0.114)	(0.166)
Homebias 50 lagged (2 periods)						0.230
						(0.187)
Number of transactions		-0.000242***	-0.000166**		-0.000198**	-0.000133*
		(7.58e-05)	(7.50e-05)		(7.78e-05)	(7.76e-05)
Number of transactions (lagged)		0.000107			0.000109	
		(9.58e-05)			(8.63e-05)	
Ronge stock market index	-1.05e-05**	-9.69e-06**	-1.02e-05**	-1.20e-05**	-1.19e-05**	-1.21e-05**
	(4.31e-06)	(4.36e-06)	(4.06e-06)	(4.66e-06)	(4.48e-06)	(4.65e-06)
Ronge stock market index (lagged)	-1.15e-06	-9.33e-07	-1.39e-06	7.96e-07	1.49e-06	5.98e-07
	(4.60e-06)	(4.91e-06)	(4.47e-06)	(4.29e-06)	(4.22e-06)	(4.38e-06)
Nazi regime (1933-1938)	-0.00193	0.00792	0.00509	0.00261	0.00788	0.00662
	(0.0120)	(0.0135)	(0.0129)	(0.0117)	(0.0122)	(0.0127)
WW II (1939-1945)	0.00581	0.00469	0.00653	0.0187	0.0195	0.0243
	(0.0156)	(0.0161)	(0.0154)	(0.0157)	(0.0160)	(0.0171)
after 1945	-0.0470**	-0.0471*	-0.0490**	-0.0300	-0.0249	-0.0230
	(0.0194)	(0.0239)	(0.0192)	(0.0194)	(0.0214)	(0.0196)
Constant	0.140**	0.150*	0.146**	0.0858*	0.0757	0.0654
	(0.0623)	(0.0822)	(0.0635)	(0.0503)	(0.0576)	(0.0522)
Observations	50	50	49	50	50	49
R-squared	0.928	0.937	0.939	0.920	0.925	0.927

Note. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

5.5 Conclusion

The preference for local investments is a well-documented and time persistent phenomenon; however, there is not much empirical research explaining this bias. With this unique historical source of portfolio choices over the lifetime of the private banker Joseph Frisch in Stuttgart, we are able to show that the bias towards local investments can, to a large extent, be explained by the overall economic circumstances, the general performance of the market, and the level of activity of the investor. Frisch's preference for local shares was highest in times of economic distress, during the Great Depression and the subsequent years in which the returns were low and he only made a few investments. The preference for local shares diminished in times of high returns, when the economy was stable and growing and when Frisch was older and more experienced. Thus, at least in this particular case, it is by no means an obscure preference for well-known areas but represents a clear economic motivation. Whether he benefited from the home bias is a question we cannot yet answer, as doing so would require a time-consuming process of constructing information on his gains and losses. Moreover, we would need to examine other, similar portfolios to determine whether our results can be generalized. Both questions, however, are a worthwhile focus for future research.

5.6 Supplementary Material: Investment Behavior of Gustav Schlott

In addition to the investment behavior of Joseph Frisch, the following section describes the investment behavior of another investor named Gustav Schlott. Compared to Joseph Frisch, he was an investor from the late 19th century. In what follows, I give a detailed overview of his investment behavior based on his diary notes.

In the first diary, there is only a family fortune of July 1878 (for the following text, see DTA 3768, 1, p. 5). Hereafter, the family owned the following cash reserves: 800 marks in cash, 700 marks in banknotes and 355 marks in gold. To call securities, they owned "Norddeutsche Grundpfandbriefe" (2,400 marks), diverse "Dividendenscheine" (3,600 marks), shares from the "Stargard-Posener railway-company" (1,007 marks) and further obligations of railway companies (1,500 marks) and "Westpreußische Pfandbriefe" (3,400 marks). This corresponded to a security share of 86.5 percent of total assets of 13,762 marks.

The second diary begins in 1885 with a preserved inheritance of 25,520 marks, of which 8,775 marks were granted as mortgages to the master smith Schneider and the widow Hanatsch from Weissenfels. The remaining money was invested in government securities and governed bonds, which were deposited at the Reichsbank in Berlin. He praised God for this: *"Gott sei Dank auch für diese Gnade!"* (DTA 3768, 2, p. 9). In February of the following year, Schlott sold covered bonds, a loan from the Wladikaswas Eisenbahngesellschaft and a change of London and Brasilian Bank with a total value of 4,000 marks to subsequently buy covered bonds from the Mecklenburg-Strelitzsche Hypothekenbank with 4 percent of interest (Ibid., p. 10).

In a later entry from this year, he sold eight consols[13] and covered bonds of various is-

[13] This refers to fixed-interest bonds without a maturity date (Delbaen 1993, p. 125).

suers and showed the date of purchase, surplus[14] and interest next to each item (Ibid., p. 11). For this Schlott recieved 30,700 marks from the Reichshauptbank in Berlin. In addition, the repayment of the mortgage over 4,500 marks by Mrs. Hanatsch took place. Of these, 35,000 marks were granted as a mortgage to Bolze's Fabrik and 500 marks to the local bank as loans. With the rest of the money, various bills and debts are settled. Again, he praised God: *"Der treue Gott schütze uns alle [...]"*. For 1888, he noted the surname of 860 marks for private lessons, which he immediately invested in covered bonds (Ibid., p. 15.). In addition, he redeemed a bill of 2,033 marks, investing 1,600 marks of it in covered bonds of the Braunschweig-Hannoverschen Hypothekenbank and paying several bills: *"Auch dafür sei Gott inniger Dank!"* (Ibid.). He also signed a term life insurance policy with Konkordia so that his family was covered in the event of his death (Ibid., p. 17). The next year, he gave the shoemaker Evers 10,500 marks on a mortgage. For the year 1890, he noted only the receipt of a change over 1,526 marks (Ibid., p. 17ff.).

In summary, it can be deduced from the second diary that Schlott invested a total of 46,480 marks in the period from 1884 to 1892. He invested almost half of them in covered bonds/consols and private mortgages.

In the third diary, Schlott noted interest income of 2,300 marks for the year 1893 (DTA 3768, 3, p. 7). In the following year, he noted revenues from various sources in the amount of 1,600 marks, which he partially invested. In 1895, he wrote down that the family was able to save 1,000 marks in April, of which 300 marks were deposited to the local bank and the remainder was invested in covered bonds of the Braunschweig-Hannoverschen Hypothekenbank (Ibid., p. 15). He also invested a received interest payment of 720 marks of a mortgagee

[14] These are probably price gains.

in covered bonds of the Braunschweig-Hannoverschen Hypothekenbank (Ibid., p. 17). The following year, Schlott received the repayment of a granted mortgage from Beddingen, increased it by 4,000 marks and lent the merchant Bokemüller in Königslutter thus a capital of 40,000 marks (Ibid.). In 1897, the family enjoyed again an inheritance of 63 marks in cash and 6,900 marks in securities (Ibid., p. 24). In the same year, they granted the baker Fischer from Königslutter a fully secured mortgage in the amount of 6,500 marks, which he paid back in 1898 (Ibid., p. 24 and 28). Schlott gave this capital back to the merchant Marheine (Ibid.). In addition, he noted for December 1897 the renewal of interest rates for two bonds, 250 marks investment at the credit institution, the redemption of a coupon and the purchase of consols for 308.40 marks and a bank deposit of over 250 marks (Ibid., p. 25f.). The last asset-related entry was made in May 1900. In that year, the family received an inheritance of 17,000 marks. From the last diary, which includes the period from 1892 to 1926, it can be deduced that Schlott invested 1,728.40 marks in covered bonds and consols, 800 marks in bank deposits and 53,000 marks in mortgages.

If one compares his investment activity from both diaries with one another, one notes that Schlott invested in the later period approximately 9,000 marks more than in the previous period. Also, the focus of investment, which was relatively balanced between covered bonds/consols and mortgages, shifted significantly in favor of mortgage lending. The capital used for mortgages was mainly given to small entrepreneurs who came from Weißenfels, Beddingen and Königslutter. The last two places are less than 30 kilometers away from his home residence in Braunschweig and in Weißenfels, where he lived and worked before moving to Braunschweig. This suggests a home bias effect on his mortgages because he only granted mortgages to people from the surrounding areas near his hometown. It is also striking that

according to the diary entries in the portfolio, the family did not hold any shares in the portfolio. Although he did not note anything about his reason to invest, he often thanks God for his successful investments, which clearly expresses his Christian way of life.

6

General Conclusions

This thesis examines investors' characteristics and investment behavior in Germany in the period of 1869 to 1955. It thereby closes the gap on what we know about historical investors in Germany in that period.

The dataset is hugely comprehensive, including information of more than 10,000 individual investors, using archival files such as shareholder lists of attendance of different general meetings, shareholder books of three different companies, portfolio information of a single investor from the 20th century and a diary entry that describes the investment strategy of an investor from the late 19th century. In this way we can give—to our knowledge—the first broader overview of historical investors in Germany during that period. Despite the short-

comings of the data, this thesis provides new insights into what we know about investors.

The descriptive pattern of chapter 2 confirms the hypothesis in the historical literature by showing that mostly men from the upper classes invested in shares during that time. Moreover, it shows that foreign investors from the neighboring countries of Germany were active at the German stock exchanges. They invested not only on the Berlin stock exchange, but also on regional German stock exchanges.

Chapter 3 brings in a new perspective in the concentration of ownership of German joint-stock firms. The choice of the six different time periods from 1869 to 1945 allows to compare different types of regimes and political events, like e.g. the hyperinflation of 1923, which was a shock to the economy and the stock market. It is shown that in the 19th century, joint-stock firms were in the hands of the men of the upper class and large banks. Ownership among lower social classes and women, then increased significantly after the hyperinflation of 1923. This probably came along with the fact that the shares became cheaper after the hyperinflation. However, the influence of investors from the upper class and large banks remained strong even after 1923, which also meant the persistence of a vast inequality of opportunities in terms of capital ownership and control.

Future research has to deal with the questions of whether different sized companies have different shareholder structures. Do smaller companies have a more regional shareholder structure compared to larger companies? Moreover, the particularities of shareholders could be studied in more detail. Were some social classes more likely to invest in specific industries than others?

Furthermore, the second part of this dissertation deals with investment behavior over time. Chapter 4 and chapter 5 study historical home bias in Germany over time.

The descriptive analysis of chapter 4 first shows that local investors were clearly important and that the existence of a home bias is present also in historical periods. Challenging these findings shows that investors' home bias is presumably overestimated. Moreover, it seems that it not only matters where company headquarters were located, but also the location of the stock exchange and whether the company listed its shares at this respective stock exchange were decisive facts for an investor to invest. However, the analysis of shareholder books of investors shows that local investment was present in historical times. Local shareholders invested mostly in local companies. The study of this phenomenon is very important, not only from a psychological perspective, but also for the economic perspective because it shows under which circumstances economic decisions are taken. Studying human decision-making will improve the understanding of human behavior. It not only contributes to the understanding of the decision-making process in general, but also to a better understanding of e.g. investment decisions. It could give major improvements to financial economic decision models in the future. With better financial models, the gap between financial economic theory and the actual behavior of economic actors in reality could be closed to some extent.

A worthwhile focus for future research is the question of whether the results for explaining the home bias can be generalized. Therefore, other data such as investment portfolios over time need to be collected, which is indeed very time-consuming.

Further questions for future research are whether the home bias was more present in historical periods compared to today and what could have triggered home bias. For example, in the years 1997 to 2005 home bias for the Eurozone was about 70 percent (Wójcik 2011, p. 68f.). This thesis shows that it was around 69 percent for historical Germany. Of course, these questions are hard to answer, but it seems that in the past, the home bias was promoted

by the fact that there were many transaction costs for the people who wanted to invest in shares. Information about e.g. potential firms to invest was often only available in the local newspapers. Locals might know the products and services of a firm better than non-local investors. The opportunity of locals to talk to employees of the firm was higher than for non-locals. Also experiencing events like e.g. the Second World War or different financial crises might have promoted the home bias of the people.

Today, it is highly likely that the regional identity of the people triggers home bias. When people feel regionally connected, the probability is higher that they also support regional companies and buy their shares on domestic stock exchanges. In this context, it is also worthwhile to examine present-day home bias in Germany with historical data on investment behavior. This analyses would go in the direction of a common regional identity as an explanation for home bias (see e.g. Dehdari and Gehring 2018).

Chapter 4 is a first step toward getting better knowledge of the factors that triggered historical home bias. However, it provides only a description of historical home bias. It fails to study the reasons for it and to provide an explanation of why there was such a home bias. Therefore, the study of chapter 5 highlights the empirical research in explaining the home bias, using portfolio information over the lifetime of one private investor. The results show that the overall political and economic circumstances affect the bias toward local investments. Also, the general performance of the market and the level of activity of the investors explain the home bias. Home bias was highest during economic recessions like e.g. the Great Depression. In economically stable times and times of high returns on the stock market, home bias diminished. Factors like experience seemed to play an important role for home bias as well because it became less important with more experience on the stock market.

Do we observe that people behaved irrationally in historical periods compared to today? The results of our study about Joseph Frisch suggest that rational considerations were behind historical home bias. The home bias rose in times of crisis, which means that this behavior had something rational. However, the study does not tell whether historical home bias was also rational in normal times.

Presently, the home bias is mostly seen as an irrational behavior because the transaction costs and information costs are way lower compared to historical times. The fact that humans behave irrationally is also interesting, especially from the finance perspective since this irrational behavior on financial markets is costly. The study of Dalbar (2015) that was mentioned in the introduction shows this very well since in this study, investors underperformed the stock market and because of this dispensed with returns. Also, the phenomenon of home bias shows this very clearly. For example, many investors forego returns because the bulk of their money is not overseas. They are not big beneficiaries because of their homeland bias. Studying this irrational behavior is important because it is possible to learn from it, which is the best way to avoid such behavior in the future.

But there are also some rational explanations for present-day home bias. It can be argued in the same direction as the rational explanation of historical home bias. The available information for investors is better for domestic shares than for foreign ones. Another rational explanation for home bias comes from Sendi and Bellalah (2010), who argue that global uncertainties about geopolitical events and emerging barriers to trade lead investors to protect their portfolios against global risks and to focus more on investments in domestic assets.

Therefore, it seems especially important for future research to further investigate whether irrationality or rationality is behind the historical and contemporary home bias phenomenon.

A

Appendices to Chapter 2

A.1 Archive Sources and Signature

Table A.1: Baden-Wuerttemberg Economic Archive (WABW)

Signature	Name
B 166/268	Depotbuch des Bankhauses Joseph Frisch und des Bankhauses Joseph Frisch Nachfolger, 1923-1957
B 2007/649	Depotbuch der Mittelschwäbischen Überlandzentrale AG in Giengen an der Brenz

Table A.2: Hessian Economic Archive (HWA)

Signature	Name
HWA 119/392	Metallgesellschaft AG, Frankfurt am Main
HWA 119/393	Metallbank und Metallurgische Gesellschaft AG, Frankfurt am Main
HWA 119/1772	Metallgesellschaft AG – F. A. Oetken: Personenbezogene Dokumentation

Table A.3: German Archive of Diaries (DTA)

Signature	Name
DTA 3768 Bd. 1, 2, 3	Tagebuchaufzeichnung von Gustav Schlott

For the archive sources and signatures of the attendance lists of the general assemblies, see Appendix to chapter 3 and 4.

A.2 Biographical information of the investors of the Metallgesellschaft AG

The following list gives an excerpt from the shareholder book of the Metallgesellschaft AG (MG). Only these investors are listed for which there was biographical information available. The other investors are not included. The list shall give an impression, that the shareholder book consists mostly members of the group of the MG, related industrial holdings/participations and close friends of the MG.

Dr. Siegfried Auerbach. He started to work for the MG in 1904 and was a director of the MG (Däbritz 1931, HWA 119/1843[1]).

[1]Hessian Economic Archive, HWA 119/1843, Metallgesellschaft AG – W. Bröhmer und S. Auerbach: Personenbezogene Dokumentation.

Leo Ellinger. He started to work for the MG in 1869. He had been a member of the supervisory board of the MG since 1881, a member of the supervisory board of the Metallurgische Gesellschaft AG since 1897, a member of the supervisory board of the Berg- und Metallbank AG since 1906 and a member of the supervisory board of the Metallbank und Metallurgische Gesellschaft AG. He died in 1916. (Däbritz 1931, Deutsche Biographie[2]).

Alexander Ellinger. He was the brother of Leo Ellinger (Ancestry.com[3])

Arthur Ellinger. He was the son of Leo Ellinger and Emma Ellinger (Ancestry.com[4]).

Emma Ellinger (born Ruben). She was the wife of Leo Ellinger (Ancestry.com[5]).

Philipp Ellinger. He was the son of Leo Ellinger and Emma Ellinger (Geni.com[6]).

Rudolf Euler. He started to work for the MG in 1891. He had been a member of the management board of the Metallurigsche Gesellschaft AG from 1903 to 1908, a deputy board member of the MG from 1908 to 1912, a member of the supervisory board of the Metallbank und Metallurgische Gesellschaft AG from 1916 to 1927, a member of the supervisory board of the MG since 1927 and a member of the administrative board ("Verwaltungsrat") of the Schweizerische Gesellschaft für Metallwerte since 1924 (HWA 119/928 Band 4[7], Däbritz 1931, Knetsch 1998).

Dr. Otto Fellner. He had been a member of the supervisory board of the Metallurgische Gesellschaft AG since 1897, a member of the supervisory board of the Metallbank and Metallurgische Gesellschaft AG and a member of the supervisory board of the MG (Däbritz 1931,

[2]Ellinger, Leo, Indexeintrag: Deutsche Biographie, URL: https://www.deutsche-biographie.de/pnd137562993.html, last accessed 04.01.2019.

[3]Hessisches Hauptstaatsarchiv; Wiesbaden, Deutschland; Bestand: 903; Signatur: 903_8844. Ancestry.com. Hessen, Deutschland, ausgewählte Geburtsregister 1851-1901 [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2016. URL: https://www.ancestry.de/family-tree/person/tree/25211763/person/26079410807/facts, last accessed 04.01.2019.

[4]Hessisches Hauptstaatsarchiv; Wiesbaden, Deutschland; Bestand: 903; Signatur: 903_9118. Ancestry.com. Hessen, Deutschland, ausgewählte Geburtsregister 1851-1901 [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2016. URL: https://search.ancestry.de/cgi-bin/sse.dll?viewrecord=1&r=5545&db=HessenBirths&indiv=try&h=177834, last accessed 04.01.2019.

[5]URL: https://www.ancestry.de/family-tree/person/tree/25211763/person/26080476228/facts, last accessed 04.01.2019.

[6]URL: https://www.geni.com/people/Leo-Ellinger/6000000031631794448#, last accessed 04.01.2019.

[7]Hessian Economic Archive, HWA 119/928 Band 4, Metallgesellschaft AG – Rudolf Euler Nachlass.

Knetsch 1998, Ancestry.com[8]).

Alice Fellner (born Merton). She was the wife of Otto Fellner (Ancestry.com[9]).

Kurt Fellner. He was the son of Otto Fellner (Ancestry.com[10]).

Hugo Fritsche. He worked for the MG from 1887 to 1928 (Däbritz 1931).

Heinrich Fuchs. He worked for the MG from 1881 to 1919 (Däbritz 1931).

Theodor von Guilleaume. He had been a member of the supervisory board of the Berg- und Metallbank AG from 1906 to 1910. (Knetsch 1998).

Grunelius AG Bank. The banking house was a business partner of the MG (Knetsch 1998).

Max von Grunelius. He was a member of the banking house „Grunelius" (Ancestry.com[11]).

Dr. Carl Hamburger. He had been a member of the supervisory board of the MG since 1881. He died in 1912 (Däbritz 1931, Knetsch 1998).

Ernst Hamburger. He was the son of Dr. Carl Hamburger (Ancestry.com[12]).

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[8] Hessisches Hauptstaatsarchiv; Wiesbaden, Deutschland; Bestand: 903. Ancestry.com. Hessen, Deutschland, ausgewählte Heiratsregister 1849-1930 [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2016. URL: https://search.ancestry.de/cgi-bin/sse.dll?indiv=1&dbid=61118&h=664661&tid=&pid=&usePUB=true&_phsrc=LBw73&_phstart=successSource, last accessed 04.01.2019.

[9] Hessisches Hauptstaatsarchiv; Wiesbaden, Deutschland; Bestand: 903; Signatur: 903_9187. Ancestry.com. Hessen, Deutschland, ausgewählte Geburtsregister 1851-1901 [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2016. URL: https://search.ancestry.de/cgi-bin/sse.dll?indiv=1&dbid=61117&h=10078&tid=&pid=&usePUB=true&_phsrc=LBw71&_phstart=successSource, last accessed 04.01.2019.

[10] Hessisches Hauptstaatsarchiv; Wiesbaden, Deutschland; Bestand: 903; Signatur: 903_9187. Ancestry.com. Hessen, Deutschland, ausgewählte Geburtsregister 1851-1901 [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2016. URL: https://search.ancestry.de/cgi-bin/sse.dll?indiv=1&dbid=61117&h=10078&tid=&pid=&usePUB=true&_phsrc=LBw71&_phstart=successSource, last accessed 04.01.2019.

[11] Hessisches Hauptstaatsarchiv; Wiesbaden, Deutschland; Bestand: 903. Ancestry.com. Hessen, Deutschland, ausgewählte Heiratsregister 1849-1930 [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2016. URL: https://search.ancestry.de/cgi-bin/sse.dll?indiv=1&dbid=61118&h=799674&tid=&pid=&usePUB=true&_phsrc=LBw68&_phstart=successSource, last accessed 04.01.2019.

[12] Hessisches Hauptstaatsarchiv; Wiesbaden, Deutschland; Personenstandsregister Sterberegister; Bestand: 903; Signatur: 903_8847. Ancestry.com. Hessen, Deutschland, ausgewählte Sterberegister, 1851-1901 [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2016. URL: https://search.ancestry.de/cgi-

Ferdinand Heberlein. He had been a member of the management board of the Metallurgische Gesellschaft AG since 1907, a member of the management board of the Metallbank und Metallurgische Gesellschaft AG until 1915, a member of the supervisory board of the Metallbank und Metallurgische Gesellschaft AG from 1915 to 1925. He died in 1925 (Däbritz 1931).

J. Langeloth. He was a deputy board member of the MG from 1884 to 1887 (Däbritz 1931).

Ludwig Joseph. He worked for the MG from 1877 to 1930 (Däbritz 1931).

Adolf Knippschild. He started to work for the MG in 1888. He was an authorized representative of the MG in Vienna and a member of the management board of the MG. He had been a deputy board member of the MG from 1903 to 1912 (Däbritz 1931).

August Ladenburg. He was a member of the banking family "Ladenburg". The banking house "Ladenburg" supported the MG. The banking house had a close relationship to the MG. Ladenburg had been a member of the supervisory board of the Berg- und Metallbank AG since 1906, a member of the supervisory board of the Metallbank and Metallurgische Gesellschaft AG, a member of the supervisory board of the MG until 1929 and member of the administrative board ("Verwaltungsrat") of the Schweizerische Gesellschaft für Metallwerte since 1910. He died in 1919 (Däbritz 1931, Knetsch 1998).

Paul Ladenburg. He was a member of the banking family "Ladenburg". (Ancestry.com[13]).

Adolf Levi. He started to work for the MG in 1898. He had been a member of the deputy board of MG since 1919 (Däbritz 1931).

Alfred Mayer. He started to work for the MG in 189. He had been a member of the deputy board of the MG since 1919. He retired in 1931 (Däbritz 1931).

Metallbank und Metallurgische Gesellschaft AG. Belonged to the group of MG and was shareholder (Knetsch 1998).

Metallgesellschaft AG. MG itself (Knetsch 1998).

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bin/sse.dll?indiv=1&dbid=61117&h=300962&tid=&pid=&usePUB=true&_phsrc=LBw65&_phstart=successSource, last accessed 04.01.2019.

[13] Hessisches Hauptstaatsarchiv; Wiesbaden, Deutschland; Standesamt I (mit Bornheim): Geburtsregister (Eintraege 4200-4472) 07.12.1888-31.12.1888; Collection: Personenstandsregister Geburtsregister; Signatur: 903. URL: https://www.ancestry.de/family-tree/person/tree/60587312/person/360161696781/facts, last accessed 04.01.2019.

Alfred Merton. He belonged to the founding family of the MG. He had been a member of the supervisory board of the MG from 1907 to 1928, a chairman of the supervisory board of the MG since 1917, a member of the supervisory board of the Berg- und Metallbank AG from 1906 to 1909, a member of the management board of the Berg- und Metallbank AG from 1907 to 1909, a member of the management board of the Metallbank und Metallurgische Gesellschaft AG, a member of the board of the MG since 1927 and a member of the administrative board „Verwaltungsrat" of the Schweizerische Gesellschaft für Metallwerte 1910 (Däbritz 1931).

Amalie Betty Merton. She belonged to the founding family of the MG. She was the wife of Rudolf de Neufville (see entry on the next page) (HWA 119/392[14]).

Richard Merton. He belonged to the founding family of the MG. He started to work for the MG in 1902. He had been a member of the supervisory board from of the MG from 1907 to 1911, vice-chairman of the management board from 1911 to 1928, a member of the supervisory board of the Metallbank und Metallurgische Gesellschaft AG since 1913 and head of it since 1917. He was head of the supervisory board of the MG and had been a member of the administrative board "Verwaltungsrat" of Schweizerische Gesellschaft für Metallwerte since 1914, vice-President of it since 1929 (Däbritz 1931).

Walter Merton. He belonged to the founding family of the MG. He had been a member of the management board of the Berg- und Metallbank AG from 1906 to 1909, a member of the supervisory of the MG board since 1913, second deputy head of the supervisory board of the Metallbank und Metallurgische Gesellschaft AG since 1910; and second deputy head of the supervisory board of the MG since 1927 (Däbritz 1931).

Moritz von Metzler. Director of the banking house „Metzler" in Frankfurt/Main. Supported the MG (Knetsch 1998).

Alfons Mumm von Schwarzenstein. He was diplomat of the German Empire (Ancestry.com[15]).

[14] Hessian Economic Archive, HWA 119/392, Metallgesellschaft AG, Frankfurt am Main - Depotbuch.

[15] Ancestry.com. Dresden, Deutschland, Heiratsregister, 1876-1922 [database on-line]. Provo, UT, USA: Ancestry.com Operations, Inc., 2015. Ursprüngliche Daten: 6.4.25 Eheaufgebote/Eheregister. Digital images. Stadtarchiv der Landeshauptstadt Dresden, Dresden, Germany. URL: https://search.ancestry.de/cgi-bin/sse.dll?indiv=1&dbid=9152&h=3376954&tid=&pid=&usePUB=true&_phsrc=LBw60&_phstart=successSource, last accessed 04.01.2019.

Emma Mumm von Schwarzenstein. She was patron and honorary citizen of St. Petersburg. She lived in Frankfurt/Main (Ancestry.com[16]).

Heinrich Fritz Mumm von Schwarzenstein. He was banker in Frankfurt/Main (Ancestry.com[17]).

Noted as "Frau" of Adolf Nall. She was the wife of Adolf Nall (HWA 119/392[18]).

Richard Nestle. He had been a member of the deputy board of the MG from 1889 to 1900 (Däbritz 1931).

Rudolf de Neufville. He had been a member of the executive board of the MG from 1897 to 1907, a member of the supervisory board of the Metallurgische Gesellschaft AG since 1908, a member of the supervisory board of the Metallbank und Metallurgische Gesellschaft AG and a member of the supervisory board of the MG (Däbritz 1931, Ancestry.com[19]).

Albert de Neufville. He was the son of Rudolf de Neufville (Ancestry.com[20]).

Otto de Neufville. He was the son of Rudolf de Neufville (Ancestry.com[21]).

Robert de Neufville. He was the son of Rudolf de Neufville (Ancestry.com[22]).

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[16] Hessisches Hauptstaatsarchiv; Wiesbaden, Deutschland; Bestand: 903; Signatur: 903_8915. Ancestry.com. Hessen, Deutschland, ausgewählte Geburtsregister 1851-1901 [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2016. URL: https://search.ancestry.de/cgi-bin/sse.dll?dbid=61117&h=300162699&indiv=try&o_vc=Record:OtherRecord&rhSource=9870, last accessed 04.01.2019.

[17] Personenstandsregister Sterberegister; Bestand: 903; Signatur: 11132. Ancestry.com. Hessen, Deutschland, ausgewählte Sterberegister, 1851-1958 [database on-line]. Provo, UT, USA: Ancestry.com Operations, Inc., 2016. Ursprüngliche Daten: Sterberegister und Namensverzeichnisse. Hessisches Hauptstaatsarchiv, Wiesbaden, Deutschland. URL: https://search.ancestry.de/cgi-bin/sse.dll?indiv=1&dbid=61119&h=1061968&tid=&pid=&usePUB=true&_phsrc=LBw56&_phstart=successSource, last accessed 04.01.2019.

[18] Hessian Economic Archive, HWA 119/392, Metallgesellschaft AG, Frankfurt am Main - Depotbuch.

[19] Stammbuch der Familie de Neufville, Stammbuchnummer 402. URL: https://www.ancestry.de/family-tree/person/tree/113185619/person/370108648141/facts?_phsrc =LBw19&_phstart=successSource, last accessed 04.01.2019.

[20] Stammbuch der Familie de Neufville, Stammbuchnummer 402. URL: https://www.ancestry.de/family-tree/person/tree/113185619/person/370108648141/facts?_phsrc =LBw19&_phstart=successSource, last accessed 04.01.2019.

[21] Stammbuch der Familie de Neufville, Stammbuchnummer 402. URL: https://www.ancestry.de/family-tree/person/tree/113185619/person/370108648141/facts?_phsrc =LBw19&_phstart=successSource, last accessed 04.01.2019.

[22] Stammbuch der Familie de Neufville, Stammbuchnummer 402. URL: https://www.ancestry.de/family-tree/person/tree/113185619/person/370108648141/facts?_phsrc =LBw19&_phstart=successSource, last accessed 04.01.2019.

Wilhelm de Neufville. He was the brother of Rudolf de Neufville (Ancestry.com[23]).

Curt Netto ("Erbengemeinschaft"). Prof. Curt Netto had been a member of the management board of the MG from 1897 to 1903 and a member of the supervisory board of the Metallurgische Gesellschaft AG from 1903 to 1909. He died in 1909 (Däbritz 1931, Knetsch 1998).

Emilie Netto. She was the wife of Curt Netto (Knetsch 1998).

Richard Ochs. He had been a member of the deputy board of the Berg- und Metallbank AG from 1906 to 1907 and a member of the supervisory board of the MG since 1920. He died in 1921 (Däbritz 1931, Knetsch 1998).

Arthur Oppenheim. He started to work for the MG in 1890 (Däbritz 1931).

Paul Prior. He started to work for the MG in 1899. He was head of the office "zur Verfolgung der Bücher und Zeitschriftenliteratur über technischen Fortschritt" at the MG (Däbritz 1931).

Paul Roediger. He started to work for the MG in 1888. He had been a member of the management board of the MG from 1889 to 1911 and a member of the supervisory board of the MG since 1927. He retired in 1911 (Däbritz 1931).

Carl Schäfer. He started to work for the MG in 1893. He had been a member of the deputy board of the MG from 1905 to 1912 and a member of the management board of the MG since 1927 (Däbritz 1931).

Georg Schwarz. He started to work for the MG in 1890. He had been a member of the deputy board of the MG from 1905 to 1912 and a member of the management board of the MG since 1931. He retired in 1930 (Däbritz 1931).

Schweizerischer Bankverein. The banking house supported the MG and held shares of the group of the MG (Knetsch 1998).

Schweizer Gesellschaft für Metallwerte. It was an industrial participation of the MG (Däbritz 1931, Knetsch 1998).

[23] Stammbuch der Familie de Neufville, Stammbuchnummer 402. URL: https://www.ancestry.de/family-tree/person/tree/113185619/person/370108648141/facts?_phsrc =LBw19&_phstart=successSource, last accessed 04.01.2019.

Carl Sussmann. He had been a member of the deputy board of Metallbank und Metallurgische Gesellschaft AG from 1919 to 1926 (Däbritz 1931).

Julius Weber. He had been a member of the supervisory board of the Metallurigsche Gesellschaft AG since 1897 and a member of the supervisory board of the Metallbank und Metallurgische Gesellschaft AG until 1925 (Däbritz 1931, Knetsch 1998).

Noted as "Frau von Julius Weber". She was the wife of Julius Weber (HWA 119/392[24]).

Hermann Winkler. He started to work for the MG in 1896. He had been a deputy member of the management board of the MG from 1906 to 1912, a member of the supervisory board of the Metallbank and Metallurgische Gesellschaft AG from 1917 to 1927 and a member of the board of MG since 1927 (Däbritz 1931).

Dr. Eduard Albert Zintgraff. He had been a member of the MG since 1910. He had a senior position at the Metallurgische Gesellschaft and was a member of the supervisory board of the Metallbank und Metallurgische Gesellschaft AG (Däbritz 1931, Knetsch 1998).

A.3 Biographical information of the investors of the Metallbank und Metallurgische Gesellschaft AG

The following list gives an excerpt from the shareholder book of the Metallbank und Metallurgische Gesellschaft AG. Only these investors are listed for which there was biographical information available. The other investors are not included. The list shall give an impression, that the shareholder book consists mostly members of the group of the MG, related industrial holdings/participations and close friends of the MG.

Julius Amschel. He was an employee (merchant) of the MG. Later, he moved to London. He stayed in close contact to the MG (Däbritz 1931).

Erich von Aswegen. He was a manager of the "Unterweser Reederei AG (URAG)". The MG had equity interests at URAG (HWA 119/1350[25]).

[24] Hessian Economic Archive, HWA 119/392, Metallgesellschaft AG, Frankfurt am Main - Depotbuch

[25] Hessian Economic Archive, HWA 119/1350, Metallgesellschaft AG – Oberingenieur Wachter: Reisebericht.

Dr. Siegfried Auerbach. He started to work for the MG in 1904 and was a director of the MG (HWA 119/1843[26]).

Dr. Barwasser. He was an engineer at Metallurgische Gesellschaft AG (Lurgi) (HWA 119/1360[27]).

Bieber & Co.. It was a corporate copper works (Däbritz 1931).

Ammy Biernbaum. Since 1909, she had been a member of the management board of the Berg- und Metallbank AG. Later, a member of the supervisory board of Metallurgische Gesellschaft AG (Däbritz 1931, Knetsch 1998).

C. Bober. He was the director of the lead works Mazarrón in Spain (Däbritz 1931).

Wolf von Eichhorn. Since 1920, he had been an employee of the Metallbank und Metallurgische Gesellschaft AG. In 1923, he gained procuration and from 1927 to 1929 he had been a manager at the Vereinigte Deutsche Metallwerke AG (VDM). Since 1932, he had been a member of the management board of the MG (HWA 119/9 Band 8[28]).

Wolfgang Ertel. Since 1927, he had been an employee of the MG. Later, he became a member of the board of the MG (HWA 119/9 Band 8[29]).

Fritz Euler. Since 1905, he had been a member of the supervisory board of the MG. He was a representative of the MG in the U.S. (HWA 119/9 Band 8[30]).

Rudolf Euler. He was the father of Fritz Euler. He started to work for the MG in 1891. He had been a member of the management board of the Metallurigsche Gesellschaft AG from 1903 to 1908, a deputy board member of the MG from 1908 to 1912, a member of the supervisory board of the Metallbank und Metallurgische Gesellschaft AG from 1916 to 1927, a member of the supervisory board of the MG since 1927 and a member of the administrative board ("Ver-

[26] Hessian Economic Archive, HWA 119/1843, Metallgesellschaft AG – W. Bröhmer und S. Auerbach: Personenbezogene Dokumentation.

[27] Hessian Economic Archive, HWA 119/1360, Metallgesellschaft AG – Dr. Barwasser: Reisebericht.

[28] Hessian Economic Archive, HWA 119/9 Band 8, Metallgesellschaft AG – Fritz Euler: Personenbezogene Dokumentation.

[29] Hessian Economic Archive, HWA 119/9 Band 8, Metallgesellschaft AG – Fritz Euler: Personenbezogene Dokumentation.

[30] Hessian Economic Archive, HWA 119/9 Band 8, Metallgesellschaft AG – Fritz Euler: Personenbezogene Dokumentation.

waltungsrat") of the Schweizerische Gesellschaft für Metallwerte since 1924 (HWA 119/928 Band 4[31], Däbritz 1931, Knetsch 1998).

Henriette Euler. She was the wife of Rudolf Euler and the daughter of the co-founder of the MG Zachary Hochschild (Knetsch 1998).

Dr. Otto Fellner. He had been a member of the supervisory board of the Metallurgische Gesellschaft AG since 1897, a member of the supervisory board of the Metallbank and Metallurgische Gesellschaft AG and a member of the supervisory board of the MG (Däbritz 1931, Knetsch 1998, Ancestry.com[32]).

Dr. M. Frank. He was plant manager of the MG in Chile in 1918 (Däbritz 1931).

Dr. Freiherr Conway von Girsewald. He was a member of the research department of the MG. He was a chemist at the MG (Däbritz 1931).

Adolf Knipschild. He started to work for the MG in 1888. He was an authorized representative of the MG in Vienna and a member of the management board of the MG. He had been a deputy board member of the MG from 1903 to 1912 (Däbritz 1931).

Emma Knipschild. She was the wife of Adolf Knipschild (Ancestry.com[33]).

Dr. Werner Kroll. Since 1917, he had been an employee of the Metallbank und Metallurgische Gesellschaft AG (Däbritz 1931).

Engelbert van de Loo. He was a lawyer and a manager of the legal department of the MG (HWA 119/21 Band 20[34]).

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[31] Hessian Economic Archive, HWA 119/928 Band 4, Metallgesellschaft AG – Rudolf Euler Nachlass.

[32] Hessisches Hauptstaatsarchiv; Wiesbaden, Deutschland; Bestand: 903. Ancestry.com. Hessen, Deutschland, ausgewählte Heiratsregister 1849-1930 [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2016. URL: https://search.ancestry.de/cgi-bin/sse.dll?indiv=1&dbid=61118&h=664661&tid=&pid=&usePUB=true&_phsrc=LBw73&_phstart=successSource, last accessed 04.01.2019.

[33] Deutsche National Bibliothek; Leipzig, Deutschland; Herausgeber: Herold; Signatur: ZC 3187; Laufende Nummer: 17, 25. Ancestry.com. Adressbücher aus Deutschland und Umgebung, 1815-1974 [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2016. ULR: https://search.ancestry.de/cgi-bin/sse.dll?indiv=1&dbid=60778&h=91541063&tid=&pid=&usePUB=true&_phsrc=LBw48&_phstart=successSource, last accessed 04.01.2019.

[34] Hessian Economic Archive, HWA 119/21 Band 20, Nassau-Selterser Mineralquellen AG, Oberselters (Nassau)

Oliver Lyttelton. He was a manager at the British Metal Corporation in London (corporation with the MG). Since 1931, member of the supervisory board of the MG (HWA 2000/283[35]).

Heinrich Merk. Since 1923, he had been an employee in the banking department of the MG. Since 1928, he had the power of attorney. In 1934, he gained procuration and in 1936 he became a member of the management board of the MG (HWA 119/23, Band 22[36]).

Otto Müller. He was a commercial employee at the MG (HWA 119/393[37]).

Georg Nau. He was an accountant at the MG (HWA 119/46[38]).

Hans Oehmichen. He was a mining engineer at the Metallbank und Metallurgische Gesellschaft AG (Däbritz 1931).

F. A. Oetken. Since 1920, he had been an employee at the MG. From 1922 onwards, he was an authorized representative at the Metallbank and Metallurgische Gesellschaft AG, department "Wärme". Since 1937, he had been a deputy board member of the MG (HWA 119/1772[39], Däbritz 1931).

Rudolf de Neufville. He had been a member of the executive board of the MG from 1897 to 1907, a member of the supervisory board of the Metallurgische Gesellschaft AG since 1908, a member of the supervisory board of the Metallbank und Metallurgische Gesellschaft AG and a member of the supervisory board of the MG (Däbritz 1931, Ancestry.com[40]).

Dr. Rudolf Ochs. Since 1907, he had been a member of the management board of the MG and head of the finance department. Since 1917, he had been a member of the supervisory board of the MG (Däbritz 1931).

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[35] Hessian Economic Archive, HWA 2000/283, Metallgesellschaft AG – Schriftwechsel mit Captain Oliver Lyttelton.

[36] Hessian Economic Archive, HWA 119/23 Band 22, Metallgesellschaft AG – Heinrich Merk: Personenbezogene Dokumentation.

[37] Hessian Economic Archive, HWA 119/393, Metallbank und Metallurgische Gesellschaft AG, Frankfurt am Main.

[38] Hessian Economic Archive, HWA 119/46, Metallgesellschaft AG – Georg Nau Nachlass.

[39] Hessian Economic Archive, HWA 119/1772, Metallgesellschaft AG – F. A. Oetken: Personenbezogene Dokumentation.

[40] Stammbuch der Familie de Neufville, Stammbuchnummer 402. URL: https://www.ancestry.de/family-tree/person/tree/113185619/person/37010864814 1/facts?_phsrc =LBw19&_phstart=successSource, last accessed 04.01.2019.

Georg Oswald. He was an employee at the MG (HWA 119/29, Band 28[41]).

Dr. Alfred Petersen. Since 1913, he had been an employee at the Metallbank und Metallurgische Gesellschaft AG and since 1917, a member of the management board (Däbritz 1931).

Dr. Ludolf Plass. Since 1919, he had been a manager of the Lurgi-Apparatebau GmbH, from 1923 to 1928, a member of the board of the Metallbank und Metallurgische Gesellschaft AG. Since 1928, he had been a member of the board of the MG (Däbritz 1931, Knetsch 1998).

Paul Prior. He started to work for the MG in 1899. He was head of the office "zur Verfolgung der Bücher und Zeitschriftenliteratur über technischen Fortschritt" at the MG (Däbritz 1931).

Dr. Karl Gustav Ratjen. He was a member of the administrative board of the Schweizerischen Gesellschaft für Metallwerke (Däbritz 1931).

Dr. Otto Reuleaux. He was an engineer and chemist at the MG (HWA 119/1576[42]).

Richard Rupp. He was an employee in the accountant department of the MG in 1938 (HWA 119/2302[43]).

Manfred Sachs. He was an engineer at the MG (HWA 119/1611[44]).

Ernst Schäfer. He was an authorized representative of the Metallbank und Metallurgische Gesellschaft AG (HWA 119/37, Band 36[45]).

Wilhelm Schmidt. He was an authorized representative of the Metallurgische Gesellschaft AG (HWA 119/38, Band 37[46]).

Dr. Oskar Schober. He was an engineer at the MG (HWA 119/2302[47]).

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[41] Hessian Economic Archive, HWA 119/29 Band 28, Metallgesellschaft AG – Georg Oswald: Personenbezogene Dokumentation.

[42] Hessian Economic Archive, HWA 119/1576, Metallgesellschaft AG – Otto Reuleaux: Tätigkeitsbericht.

[43] Hessian Economic Archive, HWA 119/2302, Metallgesellschaft AG – Oskar Schober: Personenbezogene Dokumentation.

[44] Hessian Economic Archive, HWA 119/1611, Metallgesellschaft AG – Manfred Sachs: Bierzeitung.

[45] Hessian Economic Archive, HWA 119/37 Band 36, Metallgesellschaft AG – Ernst Schäfer: Personenbezogene Dokumentation.

[46] Hessian Economic Archive, HWA 119/38 Band 37, Metallgesellschaft AG – Wilhelm Schmidt: Personenbezogene Dokumentation.

[47] Hessian Economic Archive, HWA 119/2302, Metallgesellschaft AG – Oskar Schober: Personenbezogene Dokumentation.

Julius Sommer. Since 1890, he had been an employee of the MG and a procurist of the Metallurgische Gesellschaft AG. Since 1903, he had been a member of the management board of the Metallurgische Gesellschaft AG. Since 1928, he had been a member of the management board of the MG (HWA 118/2[48], Knetsch 1998).

Hans Steuernagel. In 1919, he was a voluntary at the MG. Then he became an employee and later a member of the management board of the MG (HWA 119/41, Band 40[49]).

Bernhard Unholtz. Since 1927, he had been a member of the MG and a member of the supervisory board of the MG (Knetsch 1998).

H. Wachter. He was an engineer at the MG (HWA 119/1350[50]).

Franz Wallach. He was a director of the Australian Metal & Co. (Däbritz 1931).

Dr. Eduard Albert Zintgraff. Since 1910, he had been a member of the MG. He had a senior position at the Metallurgische Gesellschaft AG and was a member of the supervisory board of the Metallbank und Metallurgische Gesellschaft AG (Däbritz 1931, Knetsch 1998).

Dr. Magar Zöllner. He was a commercial director of the Oberschlesische Zinkhütten AG (Däbritz 1931).

[48] Hessian Economic Archive, HWA 112/2, Verzeichnis des Aufsichtsrats der VDM AG und der Berg-Heckmann-Selve AG.

[49] Hessian Economic Archive, HWA 119/41 Band 40, Metallgesellschaft AG – Hans Steuernagel: Personenbezogene Dokumentation.

[50] Hessian Economic Archive, HWA 119/1350, Metallgesellschaft AG – Oberingenieur Wachter: Reisebericht.

B

Appendices to Chapter 3

B.1 Archive Sources and Signatures – Attendance list of general assemblies

Table B.1: Baden-Wuerttemberg Economic Archive (WABW)

Signature	Name of the firm
B 26/50-67	Bleicherei, Färberei und Appreturanstalt GmbH, Uhingen
B 30/153	A. Stotz AG, Stuttgart
B 40/17, 226	Koehler AG, Oberkirch
B 40/228	W. Euler Maschinenpapierfabrik AG, Bensheim
B 49/228	Koehler AG, Oberkirch
B 150/1744-1749, 2347, 2371	Salamander AG, Kornwestheim
B 150/2371	J. Sigel & Cie. Schuhfabrik AG, Kornwestheim
B 2001/10, 136	Elektrizitätswerke Argen AG, Wangen im Allgäu
B 2007/263	Kraftwerke Untere Mindel AG, Burgau
B 2023/15-16	Württembergische Sammelschienen AG, Stuttgart

Table B.2: Bavarian Economic Archive (BWA)

Signature	Name of the firm
V 5/3	Aktienbrauerei zum Löwenbräu, München
V 5/8	Deutsche Lebensversicherungsbank Arminia AG, München
V 5/16	August Riedener Ballonfabrik AG, Augsburg
V 5/17	Aktienbrauerei Augsburg AG, Augsburg
V 5/19	Paulanerbräu Salvatorbrauerei AG, München
V 5/22	Allgäuer Baumwollspinnerei und Weberei (vorm. Heinrich Gyr), Blaichach
V 5/26, 504	Ziegelei Augsburg, Augsburg
V 5/29	Artes-Verlag AG, München
V 5/49	Buntpapierfabrik AG, Aschaffenburg
V 5/51	AG für Maschinenpapierfabrikation, Aschaffenburg
V 5/52	Niederrheinische Zellstoff AG, Walsum am Rhein
V 5/66-67	Nationalbank für Deutschland, Berlin
V 5/70	Deutsch-Asiatische Bank, Shanghai
V 5/74	Bayerische Notenbank, München
V 5/84I, 82, 84II	Barmer Bankverein, Barmen
V 5/87	Bayerische Bodenkreditanstalt, Würzburg
V 5/90	Bayerische Celluloidwarenfabrik (vorm. Albert Wacker AG), Nürnberg
V 5/91	Bayernwerke für Holzverwertung AG, München
V 5/96	Balnea AG für Reiseandenken und Fotochrombilder, Nürnberg
V 5/101	Schuhfabrik E. Heimann Aktiengesellschaft, Schweinfurt

Table B.2 – *Continued*

V 5/104, 997	Bayerisches Portlandzementwerk Marienstein AG, München
V 5/107	Bayerische Rumplerwerke AG, Augsburg
V 5/110	Bürgerliches Brauhaus, Ingolstadt
V 5/111	Bayerische Wolldeckenfabrik Bruckmühl AG, München
V 5/128, 132	Bamberger Mälzerei AG (vorm. Carl J. Dessauer), Bamberg und Mälzfabrik Stuttgart AG, Stuttgart
V 5/129	Bürstenfabrik Erlangen AG (vorm. Emil Kränzlein), Erlangen
V 5/130	Brauerei Geismann AG, Fürth
V 5/135	Bleistiftfabrik vorm. Johann Faber AG, Nürnberg
V 5/139	Bayerische Bauindustrie AG, München
V 5/141-143	Bayerische Granitaktiengesellschaft, Regensburg
V 5/151, 153-154	Gebrüder Bing AG, Nürnberg
V 5/155, 157	Bürstenfabrik Pensberger & Co. AG, München
V 5/158, 160	Bruckmann AG, München
V 5/163-164I, 166	Bergmann Elektrizitätswerke AG, Berlin
V 5/169	Bayerische Aktiengesellschaft für Energiewirtschaft, Bamberg
V 5/171	Continentale Gesellschaft für elektrische Unternehmungen, Nürnberg
V 5/172-173	Chemische Werke Brockhues AG, Niederwalluf am Rhein
V 5/175	AG für chemische Produkte (vorm. H. Scheidemandel), Landshut
V 5/217	Deutsch-Luxemburgische Bergwerks- und Hütten AG, Berlin
V 5/219	Druckerei und Kartonagen (vorm. Gebrüder Obpacher AG), München
V 5/221, 745	Direction der Disconto-Gesellschaft, Berlin
V 5/222	Danubia AG für Mineralölindustrie, Regensburg
V 5/224, 245I, 245II	Elektrizitäts-AG (vormals Schuckert & Co.), Nürnberg

Table B.2 – *Continued*

V 5/227-228	Elsenthal Holzstoff- und Papierfabrik AG, Grafenau
V 5/241	Grünerbräu AG, Fürth
V 5/248-249	Polyphonwerke AG, Leipzig
V 5/250, 252	Graphitwerk Kropfmühl AG, München
V 5/253	Aktiengesellschaft für Gasindustrie, Augsburg
V 5/258-260	Gesellschaft für elektrische Unternehmungen Ludwig Loewe & Co AG, Berlin
V 5/263	Solenhofer Aktienverein AG, Altendorf bei Sonhofen
V 5/265	Julius Sichel & Co. Kommanditgesellschaft a. Aktien, Mainz
V 5/266	Süddeutsche Metallwerke AG, München
V 5/271	Schlossbrauerei Planegg AG, Planegg
V 5/278-279	Süddeutsche Holzindustrie AG, München
V 5/280-298	AG für Seilindustrie (vormals Ferdinand Wolff), Mannheim-Neckarau
V 5/294, 295I, 295II	AG Eisenwerk-Gesellschaft Maximilianhütte, Rosenberg
V 5/305	Hotel Aktiengesellschaft, München
V 5/308	Hauser & Sobotka Getreide AG, München
V 5/309-310	F. H. Hammersen Aktiengesellschaft, Osnabrück
V 5/312-313, 316, 318	Johannes Haag Maschinen- und Röhrenfabrik AG, Augsburg
V 5/333	Georg Müller Verlag AG, München
V 5/334	Mohr & Co. AG, München
V 5/336	Mandruck AG, München
V 5/348	Mechanische Baumwoll- Spinnerei und Weberei, Kaufbeuren
V 5/349	Minimax AG, Berlin
V 5/350-351	Münchener Export Malzfabrik München AG, München

Table B.2 – *Continued*

V 5/361	Mannheimer Versicherungsgesellschaft AG, Mannheim
V 5/374	Spinnerei und Weberei Kottern, Kottern
V 5/441	Mechanische Flachs-Spinnerei Bayreuth, Laineck
V 5/501-502	Aktiengesellschaft Zuckerfabrik, Offstein
V 5/505	Zwirnerei und Nähfadenfabrik Göggingen
V 5/539	Lobers Fleischwerke AG, Augsburg
V 5/541-542	Aktiengesellschaft für Lederfabrikation, München
V 5/545I	Landshuter Keks- und Schokoladenfabrik AG, Landshut
V 5/549	Localbahn AG, München
V 5/551	Lux´sche Industriewerke AG, Ludwigshafen am Rhein
V 5/555-557	Lithoponefabrikation, Triebes
V 5/559	Ulmer Brauereigesellschaft, Ulm
V 5/587	Aktiengesellschaft Waggonfabrik Jos. Rathgeber, München-Moosach
V 5/589I	Eisenwerkgesellschaft Maximilianshütte, München
V 5/613, 2015-2016	Lech-Elektrizitätswerke AG, Augsburg
V 5/626	Wollwaarenfabrik Mercur, Liegnitz
V 5/627-628, 630	Wayss & Freytag AG, Frankfurt am Main
V 5/696	Vereinigte Zwieseler & Pirnaerfarbenglaswerke AG, München
V 5/718	Vereinigte Fabriken landwirtschaftlicher Maschinen (vormals Epple & Buxbaum), Augsburg
V 5/726	Vereinigte Landsberger Pflug- und Münchener Eggenfabriken AG, München-Pasing
V 5/728	Lithographisch-Artistische Anstalt, München
V 5/740	Ostbayerische Stromversorgung AG, München
V 5/754	Vereinigte Glaswerke AG, Augsburg

Table B.2 – *Continued*

V 5/756-757	AG Verlagsanstalt, München
V 5/814, 822, 833	Terraingesellschaft Neu-Westend AG, München
V 5/815	München-Pasinger Terraingesellschaft AG, München
V 5/821	Aktiengesellschaft Petuel'sche Terrain-Gesellschaft, München-Riesenfeld
V 5/824-829	Teisnacher Papierfabrik, Teisnach
V 5/836	Terrain-Aktiengesellschaft Herzogpark-München-Gern, München
V 5/837	Terraingesellschaft München-Friedenheim AG, München
V 5/844I	Phoenix AG für Bergbau und Hüttenbetrieb, Düsseldorf
V 5/862-865	Vereinigte Schuhfabriken Berneis-Wessels AG, Augsburg
V 5/867	Vereinigte Fränkische Schuhfabriken, Nürnberg
V 5/875	Aktiengesellschaft für Bleicherei, Färberei, Appretur & Druckerei, Augsburg
V 5/844I	Gelsenkirchener Berkwerksgesellschaft, Essen
V 5/906	Kunstmühle Tivoli AG, München
V 5/959	Oberpfalzwerke AG für Elektrizitätsversorgung, Regensburg
V 5/961, 963	Oberbayerische Überlandzentrale AG, München
V 5/964, 966	Ostwerke AG, Berlin
V 5/984	Prinzregentenplatz AG, München
V 5/988, 990	Papierfabrik Hegge, Kempten
V 5/994	Porzellanfabrik Tirschenreuth AG, Tirschenreuth
V 5/998	Bayerische Trasswerke AG, München
V 5/1001	Süddeutsche Bank, Mannheim
V 5/1023, 1025	Aktiengesellschaft Jesuitenbrauerei, Regensburg
V 5/1028	Rhein-Main-Donau AG, München

Table B.2 – *Continued*

V 5/1588	Deutsche Hypothekenbank, Weimar (Meiningen)
V 5/1619	Diamalt AG, München
V 5/1709	Fränkische Überlandwerk AG, Nürnberg
V 5/1746	Grosskraftwerk Franken AG, Nürnberg
V 5/1763	Hackerbräu AG, München
V 5/1771	Hanfwerke Füssen-Immenstadt AG, Füssen
V 5/1913, 1915	Ampferwerke Elektrizitäts-AG, München
V 5/2022	Leonische Drahtwerke AG, Nürnberg
V 5/2084	Mannesmannröhren-Werke, Düsseldorf
V 5/2111	Gesellschaft für Markt- und Kühlhallen, Hamburg

Table B.3: Hessian Economic Archive (HWA)

Signature	Name of the firm
HWA 101/41, 1020	Nassau-Selterser Mineralquellen AG, Oberselters (Nassau)
HWA 115/26	Hartmann & Braun AG, Frankfurt am Main
HWA 115/30	Zellstofffabrik Waldhof, Mannheim-Waldhof
HWA 115/50	Illkircher Mühlenwerke AG (vorm. Baumann freres), Strassbourg
HWA 115/65	Vereinigte Schuhfabriken Berneis-Wessels AG, Augsburg
HWA 115/81	M. Melliand Chemische Fabrik AG, Mannheim
HWA 115/87	Emil Herminghaus AG, Velbert
HWA 115/90	Metallwerke Unterweser AG (Friedrich-August-Hütte), Oldenburg
HWA 115/116	Deutsche Gold- und Silber-Scheideanstalt (vorm. Roessler), Frankfurt am Main
HWA 115/122	Dampfkesselfabrik (vorm. Arthur Rodberg), Darmstadt
HWA 115/123	Rheinische Stahlwerke Essen, Duisburg-Meiderich
HWA 115/126	Rhenser Mineralbrunnen Fritz Meyer & Co. AG, Rhens am Rhein
HWA 115/144	Kahlgrund-Eisenbahn AG, Schöllkrippen
HWA 115/145	Messingwerke AG, Elberfeld
HWA 115/147	Zuckerfabrik Offstein AG, Offstein
HWA 115/151	Zementfabrik Bernhard Löhr, Frankfurt am Main
HWA 115/160	Maschinenbaugesellschaft, Karlsruhe
HWA 115/165	Uhrenfabrik (vorm. L. Furtwängler Söhne AG), Furtwangen
HWA 115/170	Union Aktienbrauerei (vormals C. Ueberle & E. Charlier), Trier
HWA 115/179	Hansa Loyd Werke AG, Bremen

Table B.3 – *Continued*

HWA 115/186	Süddeutsche Zucker AG, Mannheim
HWA 115/188	Salzwerk Heilbronn, Heilbronn
HWA 115/189	Hüttenwerk Niederschöneweide AG (vorm. J.F. Binsberg), Berlin-Niederschöneweide
HWA 115/194	Sachtleben AG für Bergbau und Chemische Industrie, Köln
HWA 115/196	Verein chemischer Fabriken, Mannheim
HWA 115/197	Vereinigte Königs- und Laurahütte, Berlin
HWA 115/199	Kalle & Co AG, Wiesbaden-Biebrich
HWA 115/201	Lämmerspieler Metallwaren und Schraubenfabrik Melber & Co AG, Lämmerspiel
HWA 115/203	Verein deutscher Oelfabriken, Mannheim
HWA 115/205	Kasseler Verkehrsgesellschaft (vorm. Große Kasseler Straßenbahn AG), Kassel
HWA 115/207	H. Hildebrand & Söhne Rheinmühlenwerke AG (vorm. Rheinmühlenwerke AG), Mannheim
HWA 115/208	Mitteldeutsche Stahlwerke AG, Riesa
HWA 115/219	Westdeutsche Jutespinnerei und Weberei, Beuel am Rhein
HWA 115/222	C.H. Knorr AG, Heilbronn
HWA 115/237	Helios Elektrizitäts AG, Köln
HWA 155/240	Vereinigte Strohstofffabriken AG, Dresden
HWA 115/250	Vereinigte Stahlwerke AG, Düsseldorf
HWA 115/254	Danziger Elektrische Straßenbahnen AG, Danzig
HWA 115/262	Löhnberger Mühle AG, Siegen
HWA 115/271	Deutsche Vereinsbank, Frankfurt am Main
HWA 115/279	Klöckner Werke AG, Berlin
HWA 115/293	Lothringen Portland-Cement Werke, Metz
HWA 115/311	Schultz-Grünlack AG, Rüdesheim am Rhein

Table B.3 – *Continued*

HWA 115/318	Schaffner & Albert AG, Frankfurt am Main
HWA 115/333	Darmstädter Herdfabrik und Eisengieserei Gebrüder Roeder AG, Darmstadt
HWA 115/336	Harpener Bergbau AG, Dortmund
HWA 115/338	Vereinsbank Filiale Hamburg
HWA 115/344	Dresden-Leipziger Schellpressen Fabrik AG, Kötzschenbroda-Naundorf
HWA 115/350	Gesellschaft für Lindes Eismaschinen AG, Wiesbaden
HWA 115/358	Lüdenscheider Metallwerke AG (vorm. Jul. Fischer & Basse), Lüdenscheid
HWA 115/361	Mannesmannröhren-Werke, Düsseldorf
HWA 115/362	Gebrüder Lutz AG, Darmstadt
HWA 115/364	Vereinigte Fassfabriken, Kassel
HWA 115/370	Leander Schuhfabrik AG (vorm. Ochsenhirt & Behrens), Offenbach am Main
HWA 115/374	Lux´sche Industriewerke AG, Ludwigshafen am Rhein
HWA 115/375	Heinrich Lanz AG, Mannheim
HWA 115/391	Heidelberger Federhalter Fabrik Koch Weber & Co., Heidelberg
HWA 115/394	Dresdner Bank Filiale Frankfurt am Main
HWA 115/395	Kommunales Elektrizitätswerk Mark AG, Westfalen
HWA 115/400	Vereinigte Jute-Spinnerei und Webereien AG, Hamburg
HWA 115/401	Rudolf Karstadt Aktiengesellschaft, Hamburg
HWA 115/410	Holzverkohlungs-Industrie AG, Konstanz
HWA 115/518	Deutsche Steinzeug- und Kunststoff Warenfabrik AG, Mannheim-Friedrichsfeld
HWA 115/557	Nassau-Selterser Mineralquellen AG, Oberselters (Nassau)
HWA 115/582	Kraftwerk Altwürttemberg, Beihingen am Neckar
HWA 115/825	Löwenbräu München AG, München

Table B.3 – *Continued*

HWA 115/834	Heidelberger Straßen- und Bergbahn AG, Heidelberg
HWA 115/854	Veith Gummiwerke AG, Sanbach (Höchst)
HWA 115/981	Elektrische Licht- & Kraftanlagen AG, Berlin
HWA 115/982	Elektrizitäts-Lieferungs-Gesellschaft AG, Hannover
HWA 115/984	Enzinger Union Werke AG, Mannheim
HWA 115/1053	Aktiengesellschaft für Glasindustrie (vorm. Friedrich Siemens), Dresden und Stralauer Glashütte AG, Berlin
HWA 115/1079	Dyckerhoff & Widmann AG, Wiesbaden
HWA 115/1247	Heddernheimer Kupferwerk & Süddeutsche Kabelwerke AG, Frankfurt am Main
HWA 115/1361	Württembergische und Badische Vereinigte Versicherungsgesellschaft AG, Heilbronn
HWA 115/1539	Aktiengesellschaft für Verkehrswesen, Berlin
HWA 115/1543	Accumulatoren-Fabrik AG, Berlin
HWA 115/1655	Grün & Bilfinger AG, Mannheim
HWA 115/1662	Main-Kraftwerke AG, Höchst
HWA 115/1741	Stuttgarter Vereins Versicherungs-AG, Stuttgart und Allianz Versicherungs-AG, Berlin und Stuttgarter Berliner Versicherung, Stuttgart
HWA 115/1764	AG für Seilindustrie (vormals Ferdinand Wolff), Mannheim-Neckarau
HWA 115/1771	Allgemeine Lokalbahn- und kraftwerke-AG, Berlin
HWA 115/1787	Stuttgart-Lübeck Lebensversicherungs AG, Stuttgart und Stuttgarter Lebensversicherungsbank AG, Stuttgart
HWA 115/1953	Brauerei Schwartz-Storchen AG, Speyer
HWA 115/1980	Bank für Brau-Industrie, Berlin
HWA 115/2005	Bierbrauerei Durlacher Hof AG (vorm. Hagen), Mannheim
HWA 115/2018	Buntpapierfabrik AG, Aschaffenburg
HWA 115/2019	Brauerei Wulle AG, Stuttgart

Table B.3 – *Continued*

HWA 115/2037	Chemische Fabrik Milch AG, Oranienburg und Chemische Produkten-Fabrik AG, Pommernsdorf
HWA 115/2285	Deutsch-Asiatische Bank, Shanghai
HWA 115/2286	Deutsch-Atlantische Telegesellschaft, Berlin
HWA 115/2287	Deutsche Eisenbahn-Betriebs-Gesellschaft AG, Berlin
HWA 115/2288	Überseeische Bank, Berlin
HWA 115/2324	Spinnerei und Weberei Ettlingen
HWA 115/2392	Düsseldorf-Ratinger Röhrenkesselfabrik (vorm. Dürr & Co.), Ratingen
HWA 115/2480	Frankona Rück- und Mitversicherungs-AG, Berlin
HWA 115/2487	Frankfurter Bank, Frankfurt am Main
HWA 115/2619	Hamburg-Amerikanische Packetfahrt AG, Hamburg
HWA 115/2622	Brauerei Henninger AG, Frankfurt am Main
HWA 115/2651	Hanfwerke Füssen-Immenstadt AG, Füssen
HWA 115/2669	Hochtief AG (vormals Gebr. Helfmann), Essen
HWA 115/2808	Ilse Bergbau- Actiengesellschaft, Bückgen bei Großräschen
HWA 115/2844	Chr. Adt. Kupferberg & Co., Mainz
HWA 115/2845	Kaliwerke Neu-Stassfurt Friedrichshall AG, Neu-Stassfurt und Rhenania-Künheim Verein Chemischer Fabriken AG, Berlin
HWA 115/2939	Mainzer Aktien Bierbrauerei AG, Mainz
HWA 115/2952	Hafenmühle, Frankfurt am Main
HWA 115/3003	Mansfeld Aktiengesellschaft für Bergbau und Hüttenbetrieb, Eisleben
HWA 115/3028	Neu Guinea Compagnie, Berlin
HWA 115/3052	Adler & Oppenheimer AG (ab 1940 Norddeutsche Lederwerke AG), Berlin
HWA 115/3145	Otavi Minen- und Eisenbahngesellschaft, Berlin
HWA 115/3282	Pfälzische Mühlenwerke, Mannheim

Table B.3 – *Continued*

HWA 115/3283	Frankfurter Maschinenbau AG (vorm. Pokorny & Wittekind), Frankfurt am Main
HWA 115/3534	Schriftgiesserei D. Stempel AG, Frankfurt am Main
HWA 115/3550	Schramm Lack- und Farbenfabriken AG, Offenbach am Main
HWA 115/3737	Voltohm, Seil- & Kabelwerke AG, Frankfurt am Main
HWA 118/1102-1108	Vereinigte Deutsche Metallwerke AG, Einsal (Altona)
HWA 118/1174	AG Heddernheimer Kupferwerk (vorm. F. A. Heße Söhne), Heddernheim
HWA 118/1499 - 1500	Berg-Heckmann-Selve AG, Frankfurt am Main
HWA 119/161	Berg- und Metallbank AG, Frankfurt am Main
HWA 119/1667-1670	Metallhütte AG, Duisburg
HWA 166/19	Schwarz & Ulrich A.G., Friedberg
HWA 167/1	Metallbank AG, Frankfurt am Main
HWA 167/1+2	Metallbank und Metallurgische Gesellschaft AG, Frankfurt am Main
HWA 173/159	Main-Kraftwerke AG, Höchst
HWA 173/202-216	Lahnkraftwerke AG, Wiesbaden
HWA 179/52	Berliner Notruf Aktiengesellschaft, Berlin
HWA 179/76	Berliner Privat-Telefon GmbH, Berlin
HWA 179/224	Hanseatische Notruf AG, Hamburg
HWA 187/187-209	Firma Goebel AG, Darmstadt
HWA 203/4-5	Vereinigte Kapselfabriken Nackenheim Beyerbach Nachfolger Aktiengesellschaft, Nackenheim
HWA 217/3-8-62	Rheinischer Aktienverein für Weinbau und Weinhandel Dilthey Sahl & Co., Rüdesheim am Rhein
HWA 2017/83	Dürener Metallwerke AG, Düren
HWA (without number)	Gas und Elektrizitätswerke AG, Nassau am Lahn

Table B.4: Historical Archive of the Commerzbank AG

Signature	Name of the firm
HAC 1/143, 143I, 143II	Commerz- und Privatbank AG, Berlin / Hamburg
HAC 1/468	Commerz- und Privatbank AG, Filiale Plauen
HAC 1/669	Buderus´sche Eisenwerke, Wetzlar
HAC 1/675	Georg Geiling und Co. AG, Bacharach am Rhein
HAC 3/56	Mitteldeutsche Kreditbank, Frankfurt am Main
HAC 4/23	Barmer Bank-Verein Hinsberg Fischer & Comp., Barmen

Table B.5: Historical Archive of the Deutsche Bank AG

Signature	Name of the firm
F 038/0340	Zwirnerei & Nähfadenfabrik AG, Göggingen
K 1/949	Norddeutsche Bank, Hamburg
K 1/984	Albingia Versicherungs AG, Hamburg
K 9/6	Süddeutsche Disconto-Gesellschaft, Mannheim
K 9/12	Deutsche Bank AG, Berlin
K 15/9-17	Bergisch Märkischen Bank, Elberfeld
K 19/48	Hildesheimer Bank, Hildesheim
P 00705	Bergbau AG Lothringen, Bochum
P 01178	Finow Kupfer & Messingwerke AG, Finow
P 02985	Gothaer Waggonfabrik AG, Gotha
P 03547	Zugtelefonie AG, Berlin
P 04500	Thüringische Glasinstrumentenfabrik Alt, Eberhardt & Jäger AG, Ilmenau
P 04682	Vereinigte Brauereien AG, Meiningen
P 05299	Berliner Lombardkasse AG, Berlin
S 4020	Rheinische Creditbank, Mannheim

B.2 Classification Industrial Sectors

Table B.6: Classification Scheme of the Industrial Sectors

Industry
Banking
Insurance
Mining
Heavy Industry
Light Industry
Food Processing
Transportation
Chemical Industry
Public Utility
Others

Source. Lehmann-Hasemeyer/Opitz 2019, p. 79.

B.3 Classification Occupations

Table B.7: Classification Scheme of Occupations

Occupational Groups
Administration
Military and Marine
Church
Trade and Industry
Lawyers
Medicine
Aristocracy and Property
Teaching
Rural Tenants
'Citizens'
Diverse

Source. Mathew 1978, p. 280.

C

Appendices to Chapter 4

C.1 Archive Sources and Signatures: Attendance lists of general assemblies

Table C.1: Baden-Wuerttemberg Economic Archive (WABW)

Signature	Name of the firm
B 26/50-67	Bleicherei, Färberei und Appreturanstalt GmbH, Uhingen
B 30/153	A. Stotz AG, Stuttgart
B 40/17, 226	Koehler AG, Oberkirch
B 40/228	W. Euler Maschinenpapierfabrik AG, Bensheim
B 49/228	Koehler AG, Oberkirch
B 150/1744-1749, 2347, 2371	Salamander AG, Kornwestheim
B 150/2371	J. Sigel & Cie. Schuhfabrik AG, Kornwestheim
B 2001/10, 136	Elektrizitätswerke Argen AG, Wangen im Allgäu
B 2007/263	Kraftwerke Untere Mindel AG, Burgau
B 2023/15-16	Württembergische Sammelschienen AG, Stuttgart

Table C.2: Bavarian Economic Archive (BWA)

Signature	Name of the firm
V 5/3	Aktienbrauerei zum Löwenbräu, München
V 5/8	Deutsche Lebensversicherungsbank Arminia AG, München
V 5/16	August Riedener Ballonfabrik AG, Augsburg
V 5/17	Aktienbrauerei Augsburg AG, Augsburg
V 5/19	Paulanerbräu Salvatorbrauerei AG, München
V 5/22	Allgäuer Baumwollspinnerei und Weberei (vorm. Heinrich Gyr), Blaichach
V 5/26, 504	Ziegelei Augsburg, Augsburg
V 5/29	Artes-Verlag AG, München
V 5/49	Buntpapierfabrik AG, Aschaffenburg
V 5/51	AG für Maschinenpapierfabrikation, Aschaffenburg
V 5/52	Niederrheinische Zellstoff AG, Walsum am Rhein
V 5/66-67	Nationalbank für Deutschland, Berlin
V 5/70	Deutsch-Asiatische Bank, Shanghai
V 5/74	Bayerische Notenbank, München
V 5/84I, 82, 84II	Barmer Bankverein, Barmen
V 5/87	Bayerische Bodenkreditanstalt, Würzburg
V 5/90	Bayerische Celluloidwarenfabrik (vorm. Albert Wacker AG), Nürnberg
V 5/91	Bayernwerke für Holzverwertung AG, München
V 5/96	Balnea AG für Reiseandenken und Fotochrombilder, Nürnberg
V 5/101	Schuhfabrik E. Heimann Aktiengesellschaft, Schweinfurt

Table C.2 – *Continued*

V 5/104, 997	Bayerisches Portlandzementwerk Marienstein AG, München
V 5/107	Bayerische Rumplerwerke AG, Augsburg
V 5/110	Bürgerliches Brauhaus, Ingolstadt
V 5/111	Bayerische Wolldeckenfabrik Bruckmühl AG, München
V 5/128, 132	Bamberger Mälzerei AG (vorm. Carl J. Dessauer), Bamberg und Mälzfabrik Stuttgart AG, Stuttgart
V 5/129	Bürstenfabrik Erlangen AG (vorm. Emil Kränzlein), Erlangen
V 5/130	Brauerei Geismann AG, Fürth
V 5/135	Bleistiftfabrik vorm. Johann Faber AG, Nürnberg
V 5/139	Bayerische Bauindustrie AG, München
V 5/141-143	Bayerische Granitaktiengesellschaft, Regensburg
V 5/151, 153-154	Gebrüder Bing AG, Nürnberg
V 5/155, 157	Bürstenfabrik Pensberger & Co. AG, München
V 5/158, 160	Bruckmann AG, München
V 5/163-164I, 166	Bergmann Elektrizitätswerke AG, Berlin
V 5/169	Bayerische Aktiengesellschaft für Energiewirtschaft, Bamberg
V 5/171	Continentale Gesellschaft für elektrische Unternehmungen, Nürnberg
V 5/172-173	Chemische Werke Brockhues AG, Niederwalluf am Rhein
V 5/175	AG für chemische Produkte (vorm. H. Scheidemandel), Landshut
V 5/217	Deutsch-Luxemburgische Bergwerks- und Hütten AG, Berlin
V 5/219	Druckerei und Kartonagen (vorm. Gebrüder Obpacher AG), München
V 5/221, 745	Direction der Disconto-Gesellschaft, Berlin
V 5/222	Danubia AG für Mineralölindustrie, Regensburg
V 5/224, 245I, 245II	Elektrizitäts-AG (vormals Schuckert & Co.), Nürnberg

Table C.2 – *Continued*

V 5/227-228	Elsenthal Holzstoff- und Papierfabrik AG, Grafenau
V 5/241	Grünerbräu AG, Fürth
V 5/248-249	Polyphonwerke AG, Leipzig
V 5/250, 252	Graphitwerk Kropfmühl AG, München
V 5/253	Aktiengesellschaft für Gasindustrie, Augsburg
V 5/258-260	Gesellschaft für elektrische Unternehmungen Ludwig Loewe & Co AG, Berlin
V 5/263	Solenhofer Aktienverein AG, Altendorf bei Sonhofen
V 5/265	Julius Sichel & Co. Kommanditgesellschaft a. Aktien, Mainz
V 5/266	Süddeutsche Metallwerke AG, München
V 5/271	Schlossbrauerei Planegg AG, Planegg
V 5/278-279	Süddeutsche Holzindustrie AG, München
V 5/280-298	AG für Seilindustrie (vormals Ferdinand Wolff), Mannheim-Neckarau
V 5/294, 295I, 295II	AG Eisenwerk-Gesellschaft Maximilianhütte, Rosenberg
V 5/305	Hotel Aktiengesellschaft, München
V 5/308	Hauser & Sobotka Getreide AG, München
V 5/309-310	F. H. Hammersen Aktiengesellschaft, Osnabrück
V 5/312-313, 316, 318	Johannes Haag Maschinen- und Röhrenfabrik AG, Augsburg
V 5/333	Georg Müller Verlag AG, München
V 5/334	Mohr & Co. AG, München
V 5/336	Mandruck AG, München
V 5/348	Mechanische Baumwoll- Spinnerei und Weberei, Kaufbeuren
V 5/349	Minimax AG, Berlin
V 5/350-351	Münchener Export Malzfabrik München AG, München

Table C.2 – *Continued*

V 5/361	Mannheimer Versicherungsgesellschaft AG, Mannheim
V 5/374	Spinnerei und Weberei Kottern, Kottern
V 5/441	Mechanische Flachs-Spinnerei Bayreuth, Laineck
V 5/501-502	Aktiengesellschaft Zuckerfabrik, Offstein
V 5/505	Zwirnerei und Nähfadenfabrik Göggingen
V 5/539	Lobers Fleischwerke AG, Augsburg
V 5/541-542	Aktiengesellschaft für Lederfabrikation, München
V 5/545I	Landshuter Keks- und Schokoladenfabrik AG, Landshut
V 5/549	Localbahn AG, München
V 5/551	Lux´sche Industriewerke AG, Ludwigshafen am Rhein
V 5/555-557	Lithoponefabrikation, Triebes
V 5/559	Ulmer Brauereigesellschaft, Ulm
V 5/587	Aktiengesellschaft Waggonfabrik Jos. Rathgeber, München-Moosach
V 5/589I	Eisenwerkgesellschaft Maximilianshütte, München
V 5/613, 2015-2016	Lech-Elektrizitätswerke AG, Augsburg
V 5/626	Wollwaarenfabrik Mercur, Liegnitz
V 5/627-628, 630	Wayss & Freytag AG, Frankfurt am Main
V 5/696	Vereinigte Zwieseler & Pirnaerfarbenglaswerke AG, München
V 5/718	Vereinigte Fabriken landwirtschaftlicher Maschinen (vormals Epple & Buxbaum), Augsburg
V 5/726	Vereinigte Landsberger Pflug- und Münchener Eggenfabriken AG, München-Pasing
V 5/728	Lithographisch-Artistische Anstalt, München
V 5/740	Ostbayerische Stromversorgung AG, München
V 5/754	Vereinigte Glaswerke AG, Augsburg

Table C.2 – *Continued*

V 5/756-757	AG Verlagsanstalt, München
V 5/814, 822, 833	Terraingesellschaft Neu-Westend AG, München
V 5/815	München-Pasinger Terraingesellschaft AG, München
V 5/821	Aktiengesellschaft Petuel'sche Terrain-Gesellschaft, München-Riesenfeld
V 5/824-829	Teisnacher Papierfabrik, Teisnach
V 5/836	Terrain-Aktiengesellschaft Herzogpark-München-Gern, München
V 5/837	Terraingesellschaft München-Friedenheim AG, München
V 5/844I	Phoenix AG für Bergbau und Hüttenbetrieb, Düsseldorf
V 5/862-865	Vereinigte Schuhfabriken Berneis-Wessels AG, Augsburg
V 5/867	Vereinigte Fränkische Schuhfabriken, Nürnberg
V 5/875	Aktiengesellschaft für Bleicherei, Färberei, Appretur & Druckerei, Augsburg
V 5/844I	Gelsenkirchener Berkwerksgesellschaft, Essen
V 5/906	Kunstmühle Tivoli AG, München
V 5/959	Oberpfalzwerke AG für Elektrizitätsversorgung, Regensburg
V 5/961, 963	Oberbayerische Überlandzentrale AG, München
V 5/964, 966	Ostwerke AG, Berlin
V 5/984	Prinzregentenplatz AG, München
V 5/988, 990	Papierfabrik Hegge, Kempten
V 5/994	Porzellanfabrik Tirschenreuth AG, Tirschenreuth
V 5/998	Bayerische Trasswerke AG, München
V 5/1001	Süddeutsche Bank, Mannheim
V 5/1023, 1025	Aktiengesellschaft Jesuitenbrauerei, Regensburg
V 5/1028	Rhein-Main-Donau AG, München

Table C.2 – *Continued*

V 5/1588	Deutsche Hypothekenbank, Weimar (Meiningen)
V 5/1619	Diamalt AG, München
V 5/1709	Fränkische Überlandwerk AG, Nürnberg
V 5/1746	Grosskraftwerk Franken AG, Nürnberg
V 5/1763	Hackerbräu AG, München
V 5/1771	Hanfwerke Füssen-Immenstadt AG, Füssen
V 5/1913, 1915	Ampferwerke Elektrizitäts-AG, München
V 5/2022	Leonische Drahtwerke AG, Nürnberg
V 5/2084	Mannesmannröhren-Werke, Düsseldorf
V 5/2111	Gesellschaft für Markt- und Kühlhallen, Hamburg

Table C.3: Hessian Economic Archive (HWA)

Signature	Name of the firm
HWA 101/41, 1020	Nassau-Selterser Mineralquellen AG, Oberselters (Nassau)
HWA 115/26	Hartmann & Braun AG, Frankfurt am Main
HWA 115/116	Deutsche Gold- und Silber-Scheideanstalt (vorm. Roessler), Frankfurt am Main
HWA 115/250	Vereinigte Stahlwerke AG, Düsseldorf
HWA 115/262	Löhnberger Mühle AG, Siegen
HWA 115/333	Darmstädter Herdfabrik und Eisengieserei Gebrüder Roeder AG, Darmstadt
HWA 115/557	Nassau-Selterser Mineralquellen AG, Oberselters (Nassau)
HWA 115/1247	Heddernheimer Kupferwerk & Süddeutsche Kabelwerke AG, Frankfurt am Main
HWA 115/1543	Accumulatoren-Fabrik AG, Berlin
HWA 115/1655	Grün & Bilfinger AG, Mannheim
HWA 115/1662	Main-Kraftwerke AG, Höchst
HWA 115/1741	Stuttgarter Vereins Versicherungs-AG, Stuttgart und Allianz Versicherungs-AG, Berlin und Stuttgarter Berliner Versicherung, Stuttgart
HWA 115/1764	AG für Seilindustrie (vormals Ferdinand Wolff), Mannheim-Neckarau
HWA 115/1771	Allgemeine Lokalbahn- und kraftwerke-AG, Berlin
HWA 115/1953	Brauerei Schwartz-Storchen AG, Speyer
HWA 115/1980	Bank für Brau-Industrie, Berlin
HWA 115/2005	Bierbrauerei Durlacher Hof AG (vorm. Hagen), Mannheim
HWA 115/2018	Buntpapierfabrik AG, Aschaffenburg
HWA 115/2019	Brauerei Wulle AG, Stuttgart

Table C.3 – *Continued*

HWA 115/2037	Chemische Fabrik Milch AG, Oranienburg und Chemische Produkten-Fabrik AG, Pommernsdorf
HWA 115/2285	Deutsch-Asiatische Bank, Shanghai
HWA 115/2286	Deutsch-Atlantische Telegesellschaft, Berlin
HWA 115/2287	Deutsche Eisenbahn-Betriebs-Gesellschaft AG, Berlin
HWA 115/2288	Überseeische Bank, Berlin
HWA 115/2324	Spinnerei und Weberei Ettlingen
HWA 115/2392	Düsseldorf-Ratinger Röhrenkesselfabrik (vorm. Dürr & Co.), Ratingen
HWA 115/2480	Frankona Rück- und Mitversicherungs-AG, Berlin
HWA 115/2487	Frankfurter Bank, Frankfurt am Main
HWA 173/202-216	Lahnkraftwerke AG, Wiesbaden

Table C.4: Historical Archive of the Commerzbank AG

Signature	Name of the firm
HAC 1/468	Commerz- und Privatbank AG, Filiale Plauen
HAC 1/675	Georg Geiling und Co. AG, Bacharach am Rhein
HAC 4/23	Barmer Bank-Verein Hinsberg Fischer & Comp., Barmen

Table C.5: Historical Archive of the Deutsche Bank AG

Signature	Name of the firm
K 9/6	Süddeutsche Disconto-Gesellschaft, Mannheim
P 03547	Zugtelefonie AG, Berlin
P 04500	Thüringische Glasinstrumentenfabrik Alt, Eberhardt & Jäger AG, Ilmenau
P 04682	Vereinigte Brauereien AG, Meiningen

C.2 Archive Sources and Signatures: Shareholder books

Table C.6: Baden-Wuerttemberg Economic Archive (WABW)

Signature	Name
B 2007/649	Depotbuch der Mittelschwäbischen Überlandzentrale AG in Giengen an der Brenz

Table C.7: Hessian Economic Archive (HWA)

Signature	Name
HWA 119/392	Metallgesellschaft AG, Frankfurt am Main
HWA 119/393	Metallbank und Metallurgische Gesellschaft AG, Frankfurt am Main

C.3 Industrial holdings of the MG and the Metallbank und Metallurgische Gesellschaft in 1931

Table C.8: Industrial holdings of the MG and the Metallbank und Metallurgische Gesellschaft AG in 1931

Name of the company	Headquarter of the company
Sachtleben AG für Bergbau und Chemische Industrie	Köln
Schlesische Bergwerks- und Hütten AG	Beuthen O.-S.
Aktiengesellschaft für Bergbau, Blei- und Zinkfabrikation	Aachen
Bergbaugesellschaft St. Andreasberg m.b.H.	Herzberg/Harz
Hans Heinrich Hütte GmbH	Grube Zinnwald im Erzgebirge
Metal smelting (Däbritz 1931)	
Berzelius Metallhütten GmbH	Duisburg
Bleihütte Call GmbH	Call/Eifel
Norddeutsche Affinerie	Hamburg
Hans Heinrich Hütte GmbH	Langelsheim im Harz
Aluminiumwerk Bitterfeld GmbH	Bitterfeld
Hochofenwerk Lübeck AG	Herrenwyk bei Lübeck
Ertel, Bieber & Co GmbH	Hamburg
Metal processing (Däbritz 1931)	
Heddernheimer Kupferwerke	Frankfurt am Main/Heddernheim
Süddeutsche Metallindustrie	Nürnberg
Vereinigte Deutsche Metallwerke AG	Altena i. W.
Carl Berg	Werdohl
Basse & Selve	Altena i. W.

Table C.8 – *Continued*

C. Heckmann	Duisburg
C. Heckmann	Aschaffenburg
Basse & Fischer	Lüdenscheid
Rheinische Sprengkapsel- und Zündhütchenfabrik	Köln
Süddeutsche Kabelwerke	Mannheim
Karl Schmidt GmbH	Neckarsulm
Vereinigte Leichtmetallwerke GmbH	Bonn
AG der Chemischen Produkten-Fabriken	Pommerensdorf-Milch bei Stettin
AG Kühnle, Kopp & Kausch	Frankenthal
Participation at trading companies (Däbritz 1931)	
Rawack & Grünfeld AG	Charlottenburg
Eisenerzgesellschaft mbH	Charlottenburg, Frankfurt am Main, Düsseldorf
Branches and agencies of the MG (Dabritz 1931)	
Berlin	Köln
Beuthen O.-S.	Nürnberg
Paris	Wien
Mailand	Madrid
Tokio	Hamburg
Prag	Brüssel
New York	

Table C.8 – *Continued*

Foreign participations (Knetsch 1998)	
Schweizerische Gesellschaft für Metallwerte	Basel
British Metal Corporation Ltd.	London
Wiener Metallhandelsgesellschaft mbH.	Wien
Australian Metal Co. Ltd.	Melbourne

D

Appendices to Chapter 5

D.1 Archive Sources and Signatures

Table D.1: Baden-Wuerttemberg Economic Archive (WABW)

Signature	Name
B 166/268	Depotbuch des Bankhauses Joseph Frisch und des Bankhauses Joseph Frisch Nachfolger, 1923-1957

Table D.2: German Archive of Diaries (DTA)

Signature	Name
DTA 3768 Bd. 1, 2, 3	Tagebuchaufzeichnung von Gustav Schlott

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