

Financial globalization in the 19th century: Germany as a financial center

Julia Bersch¹ and Graciela L. Kaminsky²

This version: September 2008

We analyze the capital exports of Germany between 1883 and 1914 to study its importance as a financial center. Therefore, we collected data on foreign securities issued on German stock exchanges from primary sources. We find that Germany specialized in lending to European countries, mostly to Austria-Hungary, Russia and Italy, and was competing with France in lending to these countries. Indeed we show that shocks to the French interest rates affected German foreign investment. Great Britain, the largest international financial center, was not competing in lending to European countries but specialized in lending to previous colonies and to North and Latin America. As Germany's lending to the Americas accounted only for a low share of its foreign investment and was negligible compared to Great Britain's, shocks to the interest rates in London did not affect overall foreign issuances in Germany.

JEL: F21; N20; N23

Keywords: Capital flows, international issuances, financial centers, Germany

¹Ludwig-Maximilians-University Munich and Munich Graduate School of Economics, e-mail: julia.bersch@lrz.uni-muenchen.de.

²George Washington University

1 Introduction

Financial globalization is not a new phenomenon of the late 20th century. An important era of financial globalization and integration took already place in the 19th century. In the 19th century, Europe was the *world's banker*, lending capital to countries around the world (Feis, 1930). The main capital exporter was Great Britain, followed by France and Germany, and their capital cities were the main financial centers intermediating credit through their stock exchanges and bankers. London emerged as an important financial center following the Napoleonic Wars and became the undisputed international financial center in the 1870s. Another important financial center in the 19th century was Paris, second only to London, and contributed significantly to the financing of foreign governments and railroads since the 1820s.³ At the beginning of the 19th century, Frankfurt was the financial center of Germany and also of importance on an international level. Following the political and economic restructurings in Germany during the mid 1860s, Berlin developed as Germany's financial center.⁴ In the early 20th century, New York emerged as another important financial center challenging London's primacy (Burk, 1992).

The capital exports of a country are one way to quantify its importance as an international financial center. However, the collection of data on historical capital flows are a challenging and time-consuming task. For Great Britain, Stone (1999) compiled an extensive data set building on previous work. The characteristics of British capital flows have been studied extensively but surely not conclusively. The characteristics of France and Germany as smaller capital exporters have been investigated to a lesser degree and to our knowledge no extensive data sets are available. However, figure 1 provides a glance at the relative importance of the three financial centers in terms of capital exports.

Germany established as an important financial center after the *Deutsche Reich* was founded in 1871 following the German-French war. The territory then defined persisted until 1914. In addition to the political unification of Germany, most areas of economic life were harmonized afterwards. In 1873 the gold standard was introduced and in 1875 a central bank, the *Reichsbank*, was created. The era from 1870 until 1914 was characterized by a great expansion of economic activity in nearly all sectors, a further shift from an agricultural to an industrial economy and a concentration of powers, enterprises, and capital. The rapid economic expansion was primarily the consequence but also the cause of a fast growing population and with the transition to an industrial economy urbanization rates increased. While Germany experienced net migration outflows until the mid 1890s, it turned into inflows until 1908. During most of the years, Germany had a negative balance in the trade of goods but a positive current account balance. The main imports were raw materials, intermediate goods, and food while exports were dominated

³Detailed descriptions of the developments of London and Paris as financial centers are provided, e.g., in Cassis and Bussière (2005).

⁴Kindleberger (1974) describes the characteristics of financial centers and the development processes leading to the formation of national and international financial centers.

by industrial products, especially chemicals and textiles. National income and savings were steadily growing and made Germany a net creditor. (Hoffmann, 1965; Riesser, 1912)

Before World War I, Germany was an important capital exporter; however, the amount of foreign securities issued in the German capital markets did not grow but varied significantly over time. Between 1883 and 1913, Germany invested roughly 680 million British pounds in foreign securities (630 million capital called) corresponding to an average of 22 million pounds per year.⁵ The capital was predominantly invested into European countries but also other regions obtained considerable amounts of capital. In the first half of the 19th century, private banks were the main financial intermediaries for foreign securities, but they were increasingly displaced by the joint-stock banks.

The goal of the present study is to analyze the role of Germany as a financial center by characterizing aggregate issuances and in particular foreign issuances in German stock exchanges. The floatation of domestic securities clearly dominated aggregate issuances, quantitatively and qualitatively, and was closely linked to German economic activity. Foreign issuances were less clearly related to German economic growth than to external conditions. The large majority of foreign securities were bonds and the main issuers were governments and railroad companies. The main beneficiaries of the foreign investment were Germany's neighboring countries. Furthermore, more developed and less distant countries were more likely to additionally float equity in Germany. Thus, informational frictions and the pecking order relevant for trade in financial assets in the late 20th century seem to have been important already in the late 19th century. As most of the large international bonds were issued simultaneously in the main financial centers, the conditions in German capital markets relative to Great Britain and France were likely important determinants of foreign issuances in Germany. Therefore, we provide insights into the degree of financial integration between the three main financial centers. We find that shocks affecting the interest rate differential between Germany and France had a significant impact on foreign issuances in Germany. Furthermore, the low interest rate differentials between the three financial centers suggest a high degree of financial integration.

Previous work on German capital exports focuses mainly on the seeming contradiction between the capital exports and the apparent capital shortage in German capital markets. This discussion embraces also the determinants of German capital flows, in particular, whether political or economic considerations were the main drivers of foreign investment in the 19th century, see, e.g., Lenz (1922), Feis (1930), and Esteves (2008). Several studies have significantly contributed to the literature by qualifying and quantifying the nature of German capital exports further, e.g., Pohl (1977), Schaefer (1993), and Esteves (2008). However, these studies focus either on the determinants of German capital exports from the perspective of the issuing countries and, thereby, on the pull effects on capital flows, e.g., Esteves (2008), or on the conditions in the German capital markets as determinants for the investment in foreign securities, e.g.,

⁵The amounts originally reported in mark are converted at the exchange rate of 20.4 marks per British pound.

Tilly (1992). We add another aspect to the analysis and study the characteristics of Germany as a financial center.

The remainder of this study is organized as follows. Section 2 describes the development of German capital markets, the main players involved in foreign issuances, stock exchange regulations, and the process of issuance. Section 3 presents our data sources and characterizes both aggregate domestic and foreign securities issued in Germany; then, it analyzes the structure of German capital exports through the individual foreign securities sold in Germany. The role of external shocks on foreign issuances in Germany and the role of Germany as a financial center are studied in section 4. Section 5 concludes and provides an outlook to future research.

2 Capital markets, main players, and regulations in stock exchanges

Germany was the third most important capital exporter during the 19th century lending to countries around the world. At the beginning, when government credit was the primary application, capital was mainly intermediated by the private banks. Starting in the 1830s, the financing of the railroad construction and of the advancing industries exceeded the funding capacity of the private banks and, therefore, financial intermediation shifted towards the stock exchanges and to the newly created joint-stock banks. Until the 1860s, Frankfurt was the financial center of Germany but lost its status to Berlin following the political and economic reorganization of Germany.⁶ Next, the developments of the German stock exchanges and the main intermediaries of foreign credit are examined. Afterwards, the regulation of the stock exchanges and the process of issuance are described.

2.1 Development of the German stock exchanges

The onset of modern trading at the stock exchange in Frankfurt a.M. is placed around the turn of the 19th century. The rise of Frankfurt a.M. as a financial center was paralleled by the decline of Amsterdam which was the most important market for government bonds until the end of the 18th century. From the beginning, Frankfurt was an important financial center on an international level and intermediated credits to foreign governments. At that time, the banking house Gebr. Bethmann was one of the most important private banking houses and intermediated the majority of German government credit and made bond financing an important area of business from the middle of the 18th century onwards. Frankfurt's importance as financial center rested also on the presence of the M.A. Rothschild & Söhne whose German headquarters were located in Frankfurt. The Rothschilds increasingly displaced the Gebr. Bethmann and dominated the intermediation of international credits. The Frankfurt stock exchange was the

⁶Kindleberger (1974) describes the transition from Frankfurt as the financial center to Berlin and back to Frankfurt after World War II.

most important one in Germany until the 1860s when Germany was politically reorganized and Berlin became the capital of the newly founded *Deutsche Reich*. As a consequence, the Frankfurt stock exchange lost importance relative to Berlin although in absolute terms it was still growing.⁷

The foundation of the stock exchange in Berlin was based on a decree from 1796 and it had its first formal regulation in 1825. The railroad construction period in the middle of the 19th century and the induced trading in railroad equity are considered the cornerstone for Berlin's importance as a financial center.⁸ Frankfurt was mainly a stock exchange for bonds, in particular government bonds, and the private bankers in Frankfurt refused to introduce equity for a long time. In contrast, the Berlin stock exchange was open to equity and introduced numerous railroad shares. This contributed to a substantial shift in financial intermediation from Frankfurt to Berlin and, thereby, to the relocation of the financial center. The stock exchange in Hamburg was the third in importance in Germany after Berlin and Frankfurt. When Amsterdam lost its position as premier financial center, Hamburg was a major beneficiary of the reallocation of foreign trade and, thus, of trade financing. At the onset of World War I, Hamburg had achieved a comparable position as Frankfurt as financial center (Gömmel, 1992).

In addition to their specialization in market segments, the lending of the three main German stock exchanges was regionally specialized as illustrated in table 1. According to the tax statistics reported by the Börsen-Enquete-Kommission (1893), the majority of foreign securities, 81 per cent, was taxed at the stock exchange in Berlin. Although the location where the taxes were paid did not necessarily coincide with the place of issuance, it gives an idea of the relative importance of the three stock exchanges. The countries outside Europe drew nearly exclusively on the Berlin stock exchange while North & Central Europe relied mostly on the Hamburg stock exchange. The Frankfurt stock exchange was an important alternative to Berlin for South and East European borrowers. The stock exchanges were important market places for investors and intermediating banks. However, international loans and investments were also made outside the stock exchanges, mainly by the banks.

2.2 Main players

The investment in international securities and the intermediation of international loans were made both by the private banks and the joint-stock banks. However, while the financial intermediation was dominated by the private banks until the middle of the 19th century, the increase in loan volumes to finance the construction of railroads and the heavy industry led to the formation of joint-stock banks. Following the concentration process in the banking sector

⁷Wormser (1919) describes the developments of the stock exchange in Frankfurt in detail.

⁸The development of the Berlin stock exchange is analyzed at length by Spangenthal (1903) and Gebhard (1928).

in the late 19th century, the so-called Great Banks dominated the financial intermediation.⁹ The universal banks, pursuing all kinds of banking activities, were characteristic of the German banking system in contrast to the specialized British banks. The German banks engaged in the underwriting, formation, and reorganization of companies while they refrained from creating pure deposit banks. During all times, they were also involved in the intermediation and underwriting of foreign securities. (Riesser, 1912)

Until the middle of the 19th century, foreign loans in Germany were mainly intermediated by the private banks who lent their own capital. However, as the demand for financing increased beyond what banks could handle by themselves, the banking house Bethmann, founded 1748 in Frankfurt, and other private banks created the *Partialobligation* and, thereby, started the intermediation of securities. Through the *Partialobligation* the banks acquired external funds while explicitly acknowledging the actual borrower and, thus, excluding any liability.¹⁰ The trading of these securities was then a next step. In Frankfurt, the Bethmanns and the banking house B. Metzler seel. Sohn & Co. (founded 1674) were the main bankers around 1800. Later on, the Rothschilds became the main private bankers in Frankfurt were Meyer Amschel Rothschild founded M. A. Rothschild & Söhne with his sons in 1810. The presence of the Rothschild brothers in all important financial centers was pivotal for their outstanding international financial role since private contacts and relations as well as local knowledge were crucial in overcoming information asymmetries.¹¹ Other important private banks in Frankfurt were Jacob S. H. Stern (1805), Lazard Speyer-Ellissen (1846), and Erlanger & Söhne (1859). Frankfurt was the most important banking center until around 1860, followed by Cologne. The most important private banks in Cologne were Sal. Oppenheim & Cie. (1789)¹² and A. Schaaffhausen (1790). Until the financing of the railroad construction and the heavy industry started in the 1830s, the main banking business was government loans. With the railroad construction, Berlin gained importance and with it the main private banks Gebr. Schickler (1796), S. Bleichröder (1803), Mendelssohn & Co. (1805), and R. Warschauer & Co. (1849). Hamburg played a special role in foreign trade financing and the most important private banks were L. Behrens & Söhne (1780) and M. M. Warburg & Co. (1798). (Wormser, 1919; Gebhard, 1928; Born, 1977)

As the financial needs and transaction volumes of both industries and issuance business

⁹Riesser (1912) provides a detailed account of the German banking system, its activities, and the concentration process.

¹⁰With the *Partialobligation*, the private banks created a new financial instrument to acquire external funds which could then be lend. The novelty was that the banking house borrowed funds from numerous private persons, bundled them, and lent the amount as one loan. The bankers wrote partial certificates of debt to the lenders but were not anymore liable in case of bankruptcy of the borrower. It thereby represented a new form of financial intermediation between small investors and big borrowers without the private bankers being personally liable. (Wormser, 1919)

¹¹The Rothschild office in London was established in 1804 and in Paris in 1812/15. The agencies in Vienna and Naples, established in 1816 and 1820, respectively, were branches of the Rothschild office in Frankfurt until 1844, when they become independent offices. Born (1977) discusses the role of personal networks in overcoming information asymmetries further.

¹²Salomon Oppenheim was founded 1789 in Bonn and relocated to Cologne in 1801. (Born, 1977)

increased further, it became more and more difficult for private banks to manage these by themselves even with external funds. Especially the financing of the railroad construction posed a big challenge to private bankers. As a consequence, private banks cooperated both informally through syndicates and formally through the foundation of new banks. As a matter of fact, most joint-stock banks were created by private bankers or were the result of reorganizing an existing private bank. In the first foundation wave between 1848 and 1870, four of the Great Banks were established. The *A. Schaaffhausen'scher Bankverein* was founded 1848 in Cologne through the reconstruction of the bank house A. Schaaffhausen. In 1851 the *Disconto-Gesellschaft* was founded in Berlin and became an actual joint-stock bank in 1856 through a change in legal status. Also the *Bank für Handel und Industrie*, founded 1853 in Darmstadt by the private bankers Gustav Mevissen and Abraham Oppenheim, was a major player in the intermediation of international loans. Due to its location in Darmstadt, the bank is generally known as *Darmstädter Bank*. (Riesser, 1912) The *Berliner Handelsgesellschaft* was founded in 1856 under the participation of Mendelssohn & Co., S. Bleichröder, Robert Warschauer & Co., and Gebr. Schickler. In the second wave of joint-stock bank foundations starting in 1870, the *Deutsche Bank* and *Dresdner Bank* were established. In 1870 Gebr. Schickler, A. Schaaffhausen'scher Bankverein, Gebr. Sulzbach, and others founded the Deutsche Bank in Berlin. The Dresdner Bank was built in 1872 on the basis of the private bank house Michael Kaskel in Dresden in cooperation with the Berliner Handelsgesellschaft and relocated to Berlin in 1881. (Gebhard, 1928) From the late 19th century onwards, a strong concentration process took place in the banking sector and until the beginning of the 20th century, most private banks were taken over by the Great Banks. For example, the business of the Rothschilds in Frankfurt was taken over by the Disconto-Gesellschaft in 1901 and the Frankfurt bank house Erlanger & Söhne by the Dresdner Bank in 1904. (Born, 1977)

While most private banks in Germany had their origins in the trade and shipping business or were the private financiers of German sovereigns, in the last quarter of the 19th century the German joint-stock banks emerged as universal banks, involved in all types of banking activities. They engaged in the financing of industries, trade, and governments through underwriting, foundation, and reorganization activities and through the foundation of appropriate institutions, both domestically and internationally. The Great Banks improved and extended their international business first by creating affiliates abroad, later by founding new banks overseas and delegated part of the international issuance business.¹³ However, the private banks and the Great Banks continued to carry out the biggest international transactions by themselves. The underwriting and issuance of foreign securities was in general directed by syndicates, mostly international ones, formed for a limited number of transactions or even individual deals. Only very few syndicates or banking groups dominated the business with a specific country over prolonged time periods. (Born, 1977) When syndicates issued securities, the underwrit-

¹³Otto (1910) and Steinmetz (1913) elaborate on the activities of the Great Banks overseas including their foundation activities.

ing syndicate was often different from the introducing syndicate and it was common that the underwriters themselves gave sub-participations to other banks to reduce their economic responsibilities. In general, the leader of the syndicate then actually sold the securities at the stock exchanges or entrusted another company or bank to do so. Mostly, the securities were issued piecewise trying to influence the price. (Lotz, 1890)

2.3 Regulation of the stock exchanges

In the first half of the 19th century, the German stock exchanges were subject only to self-determined regulations and not to government regulation, except for the ban on forward trading in Berlin. Due to widespread speculation first in Spanish, then in other foreign securities, and finally in railroad equity, consecutive regulations were established that prohibited forward trading in these securities between 1836 and 1844 in Berlin and were abolished only in 1860. (Spangenthal, 1903) The Stock Exchange Act of 1896 was the first one to regulate the stock exchanges on a national level. The regulation followed closely the recommendations of the *Börsen-Enquete-Kommission* (Committee of the Stock Exchange Inquiry) who conducted a detailed analysis of the stock exchanges in Germany. The new regulation restricted forward trading in securities significantly, required the publication of a prospectus for securities applying for admission to trade, and made the underwriting banks accountable for the content of these prospectuses.¹⁴ As the individual stock exchanges had their own rules governing the admission of securities for trade already prior to the Stock Exchange Act, the consequences of the regulation for capital markets and the intermediaries are not trivial. The restrictions in forward trading are often mentioned as having contributed to the concentration in the banking system, e.g., Fohlin (2002). The induced increase in spot transactions severely reduced the flexibility of the capital markets and favored the bigger banks over the private banks. The prospectus requirements are unlikely to have significantly affected foreign issuances as also the UK and France had similar requirements for the floatation of foreign securities. Wetzel (1996) does not find any statistically significant impact of the Stock Exchange Act on domestic and foreign issuances and Fohlin (2002) finds only a small effect on the concentration in the banking system.

Furthermore, starting in 1881, the government imposed two types of taxes on trading in securities, an issuance tax (*Effektenstempel*) and a turnover tax (*Umsatzstempel*). The issuance tax was levied on all securities sold at an initial public offering in Germany with the exception of German government bonds; the turnover tax was levied on all security transactions. For both taxes, different rates applied to different types of securities and to domestic and foreign borrowers. The tax rates were successively increased in 1885, 1894, 1900, and 1909. Starting in 1894, the issuance tax was also due on foreign assets bought outside of Germany if the investor

¹⁴Wetzel (1996) discusses the Stock Exchange Act and its implications in detail.

resided in Germany and the securities were not held in an account abroad.¹⁵ The tax increases on foreign securities significantly reduced the attractiveness of the German stock exchanges for both foreign issuers and domestic investors. The displacement of German capital to foreign stock exchanges might have been significant. According to Fritzsche (1913), German investors increasingly bought foreign securities outside the German capital markets; the amount of foreign securities held in deposits outside the country, and, thus, not subject to the taxes, increased nearly threefold between 1893 and 1902, from 7.5 million pounds to 22 million pounds.

While German central government bonds were automatically admitted for trade at the stock exchanges, all other securities had to apply for admission which had to be formally filed for by a German bank. The admission of foreign securities was required for the whole amount issued and not only the share offered for subscription in Germany, thereby facilitating the international trade in these securities. (Kleiner, 1914) Even though the admission to official trading had the advantage of facilitating the issuance and placement of a security, numerous securities were sold exclusively on the *free* market. A very rough estimate of the relative importance of the free market, i.e., the trading outside the stock exchanges, is provided by the Börsen-Enquete-Kommission (1893) for the stock exchange in Hamburg. While only 129 foreign securities with a face value of 17 million pounds were officially introduced to the Hamburg stock exchange between 1880 and 1892, 678 securities with a nominal amount of 27 million pounds were taxed.¹⁶ This leaves 10 million pounds to 549 not officially admitted securities, corresponding to 37 per cent of the value of the foreign securities bought by German investors. However, it also points at the fact that the big international issuances were traded through the stock exchanges while it were mainly smaller securities bypassing the stock exchanges.¹⁷

2.4 The process of issuance

Zickert (1911) describes the most common ways foreign securities were sold in Germany. The main ways of introducing new foreign securities to the investing public were the advertisement through newspapers and circulars and the recommendation by banks and bankers to their clients. Foreign securities were sold either through the introduction at a German stock exchange or directly by the banks to their customers. Through their deposit banks and affiliates the Great Banks had direct access to private investors and could sell foreign securities without requiring the admission to a stock exchange to make the information available. Especially foreign securities underwritten by syndicates were often not placed on stock exchanges but directly sold to the banks' customers. The quantity of foreign securities publicly offered for subscription while bypassing the stock exchange administration office was also non-negligible.

¹⁵Details on the tax regulation and the successive amendments are described, e.g., in Meyer (1902), Kleiner (1914), the *Frankfurter Zeitung*, and the *Deutsche Oekonomist*.

¹⁶The tax applied to all foreign securities bought by German investors, independent on whether they were bought through a stock exchange or not.

¹⁷The average amount of the officially admitted securities was 132 thousand pounds, while the not admitted securities only amounted to 18 thousand pounds on average.

Zickert (1911) estimates that in 1909 and 1910 approximately 11 per cent of all foreign securities were offered for subscription without being admitted to a stock exchange. To introduce a foreign security to the stock exchange, the underwriters had to apply for admission; afterwards, in general, an invitation for subscription followed. However, it had become common practice among underwriting banks at the turn of the century to carry out the subscription prior to the successful admission to a stock exchange as pointed out by the *Deutsche Oekonomist* (August 5, 1899; July 9, 1904). The banks justified this procedure with the time-consuming admission process in Germany which left them with a disadvantage over their fellow underwriters in international syndicates and would require them to refrain from such activities. (Zickert, 1911)

Marx (1913) distinguishes two ways in which new securities were distributed to the public: direct and indirect issuance. In case of a direct issuance, the person or company raising capital offered its securities directly to the public through public subscription or over the counter. Direct issuance was only common practice for German government bonds until the middle of the 19th century, afterwards they were mediated mainly through the Prussia-Syndicate. The more common form was the indirect issuance where a banker or bank syndicate intermediated between the public and the capital searcher. In general, the banks underwrote the whole security, i.e., they bought it for a fixed transfer price and distributed it at their own expenses to the public. For foreign issuances only the indirect method was relevant. The security was then sold to the public either by public issuance, i.e., through subscription invitations or introduction to a stock exchange, or by sale over the counter, advertised through letters to customers and non-customers. Securities issued and sold over the counter were very hard to capture statistically as the process took place off the public without announcements, prospectuses or suchlike in the public press or in other public form. Usually, more than one issuance method was used at a time.¹⁸

3 International issuances

The time period under scrutiny starts in 1883, the year in which the *Deutsche Oekonomist* started publishing data on securities issued on the German stock exchanges and when the turbulences following the *Gründerkrise* (Founding Crisis) of 1873 most likely already faded. As the capital markets basically shut down when World War I started, our sample period ends in 1913. The data sources are described next. Then, the aggregate amounts of capital floated on the German stock exchanges between 1883 and 1913 are analyzed and the similarities and differences between domestic and foreign issuances are studied. Finally, we look at foreign investments made between 1883 and 1897 by using disaggregated data of foreign securities issued on the German stock exchanges.

¹⁸Lotz (1890) provides a very detailed description of the issuance process in Germany.

3.1 Data sources

To quantify the amount of domestic and foreign securities issued on the German stock exchanges, the most widely used and valued statistics are provided by the *Deutsche Oekonomist* located in Berlin and the *Frankfurter Zeitung* located in Frankfurt. The purpose of the issuance statistic of the *Deutsche Oekonomist* was to provide “the most precise possible answer to the question to which extent the capital and money markets have been drawn on by issuances of securities during a specific time period” (January 14, 1911). Thus, only officially admitted securities, based on prospectuses were included. In general, the overall amount admitted based on the subscription price or the introductory rate was reported even though only a fraction may have been introduced during the admission year or allocated following the subscription. It was especially common for real estate and agricultural mortgage bonds that the issuance was extended over prolonged time periods.¹⁹ Conversions, restructurings, and mergers were excluded; only increases in capital were included. (*Deutsche Oekonomist*, January 14, 1911) A peculiarity of foreign securities was that the application to German stock exchanges had to be made for the whole amount issued and not only the share offered for subscription or sold in Germany. As has been pointed out also elsewhere in the literature, e.g., Bankenquete (1910) and Marx (1913), it is extremely hard if not impossible to accurately know the shares of foreign securities actually placed in Germany. The *Deutsche Oekonomist* states that “the issuing house only knows the exact amount actually placed in Germany during the here considered limited time period after the issuance; but it will reveal this amount only possibly if it was sold out, an information not identical to the information that there was an over-subscription” (September 11, 1909). Nevertheless, the *Deutsche Oekonomist* reported tentative estimates of the amount of international securities sold in Germany based on information of the issuing houses if available. However, this detailed information is only available until 1897 as the *Deutsche Oekonomist* stopped publishing detailed lists with the securities sold in Germany. The reason provided by the *Deutsche Oekonomist* was that the number of securities had increased too much to report them individually (January 14, 1899). However, at the same time the *Kaiserliche Statistische Amt* (Government Statistical Office) started publishing the amounts of securities admitted for trade. As the amounts of foreign securities admitted for trade exceeded the amounts sold in Germany by wide margins, this information is only of limited use for the analysis of capital exports intermediated by the stock exchanges.

The issuance statistic of the *Deutsche Oekonomist* is available starting in 1883, while the statistic of the *Frankfurter Zeitung* is available only for a much smaller time period, starting in 1896. We therefore follow Esteves (2008) and other related literature in using the data provided by the *Deutsche Oekonomist*. The amounts originally stated in marks are converted into British pounds at the exchange rate of 20.4 marks per pound.

¹⁹The *Deutsche Oekonomist* reported rounded estimates of the German mortgage bonds for the current year and revised them when the bank statistics were made. (July 13, 1895)

3.2 Aggregate issuances

The aggregate amount of securities issued in the German stock exchanges during a specific year is a measure of new capital investments, both in domestic and foreign applications. The aggregate issuances in Germany increased over the sample period and fluctuated with four local peaks broadly corresponding to peaks in the German business cycle²⁰: in 1888 (98 million pounds), 1899 (110 million pounds), 1905 (148 million pounds), and 1908 (164 million pounds), see figure 2. Capital was invested both in German and foreign securities. While the amount invested in domestic securities increased over time, foreign securities fluctuated without trend, see figure 3. The fluctuations in aggregate issuances were mainly driven by domestic issuances exhibiting a very similar time pattern²¹, with the exception of the peak in 1905 due to an outstanding amount of 60 million pounds in foreign securities. Foreign securities quantitatively dominated total issuances only until 1886; afterwards their share declined with the exception of two peaks around 1897 and 1905.

The variations in foreign issuances were dominated by the floatation of government and railroad bonds, see figure 4. The exceptional amount of foreign issues in 1905 is related to the Russian-Japanese war. The war led to the floatation of a Russian government bond of 12 million pounds and three Japanese government bonds summing up to 16 million pounds, thereby accounting for half of all foreign securities floated that year. Government bonds were also an important determinant of fluctuations in domestic securities, see figure 5. Furthermore, investments in mortgage and industrial securities were quantitatively significant while railroad securities played nearly no role among domestic securities. The railroad boom in Germany took place earlier in the 19th century and most railroad companies were nationalized starting in the late 1870s. (Riesser, 1912; Tilly, 1992) Hence, railroads were mainly financed through government securities afterwards. While government bonds exhibited a similar pattern as overall economic activity, industrial securities increasingly displaced mortgage securities.

In the aggregate, 82 per cent of capital was invested in bonds and only 18 per cent in equity. The preference for bonds was even stronger for foreign securities: only 8 per cent of the foreign securities floated in Germany were equity. However, the relative importance of bond versus equity financing varied significantly over time, both for domestic and foreign securities and across sectors, see figure 6. Bonds were mainly issued by domestic and foreign governments, followed by domestic mortgage institutions and foreign railroad companies. The industrial sector in Germany was the main receiver of equity financing. Furthermore, German banks issued substantial equity. Investment in foreign equity, however, was mostly directed towards railroad financing and, at the beginning of the 20th century, increasingly towards the banking sector. As bondholders are senior lenders relative to equity holders, investing into bonds involves a lower risk than into equity. Accordingly, the issuance of equity was particularly volatile.

²⁰These peaks correspond both to periods of high economic growth and to peaks in the detrended German GDP series using the Hodrick-Prescott filter.

²¹The correlation between the two series is 0.94.

Furthermore, information asymmetries between lenders and borrowers may be exacerbated by geographical distance and, thus, be higher for foreign than domestic investments.²²

Different types of financial instruments involve diverging degrees of risk and so do different types of borrowers. Even though governments can, and sometimes do, default on their debt, government bonds may be considered safer investments than bonds of other issuers. Due to their taxing power, insolvency is a lesser concern for governments than for private enterprises. Furthermore, less information is needed to evaluate a government's financial situation than a private company's one.²³ In the 19th century, most railroad companies enjoyed some form of government guarantees, either explicitly or implicitly, and, therefore, the investment risk was reduced as compared to industrial companies. Private industrial companies may be considered the riskiest borrowers as the available information relative to the necessary one was probably the least and the solvency risk substantially higher than for governments and government guaranteed railroad companies.

Germany invested in securities of countries around the world and countries were different and involved diverging degrees of actual and perceived risk. The disaggregation of foreign securities to the country or at least regional level helps in identifying patterns in the foreign investment and is pursued in the next section.

3.3 Individual foreign securities

German capital was financing governments, railroads, and industrial companies around the world. Using disaggregated data on the foreign securities floated in Germany reveals the countries and regions that were the main beneficiaries of the capital flows and contributes to our understanding of foreign investment decisions. However, the *Deutsche Oekonomist* provided disaggregated data only until 1897. The collection of the disaggregated data for the remaining period until 1913 is the subject of ongoing research. Still, the reduced sample from 1883 until 1897 offers interesting insights into the characteristics of German capital exports and is therefore analyzed in detail.

Table 2 illustrates the main regional pattern in foreign investment made through the German stock exchanges between 1883 and 1897.²⁴ The majority of foreign securities, i.e., 80 per cent, was issued by European countries, more specifically Austria-Hungary and Russia who received 21 and 22 per cent, respectively, followed by South Europe, i.e., mainly Italy, with 16 per cent. The second most important continent were the Americas whose securities floated in Germany

²²German investors' knowledge of foreign countries was probably very limited and, therefore, the risks involved when investing in these countries substantial. By lending through bonds the risk could be reduced. The role of informational frictions for trade in financial assets is discussed in the next section.

²³In the 19th century, information asymmetries were most likely substantial as the transmission of information was costly, see, e.g., Flores (2007).

²⁴We focus on the country of location of a railroad, bank, or company, and, thereby, concentrate on the characteristics and risks of the country where the business was carried out as compared to the nationality of the owner.

accounted for 16 per cent of all international issuances, with only a slightly higher share in North America than Latin America. However, the relative importance of the regions varied over time, see figure 7. During the late 1880s, the Americas gained considerable weight in international issuances, especially through increased floatations of Latin American securities. However, between 1891 and 1894, no Latin American securities were floated in Germany, probably as a reaction to the Baring crisis in 1890.²⁵ The composition of the European securities also varied substantially. The South European countries increased the floatation of securities in the late 1880s and early 1890s when Austria-Hungaria had a low participation and Russia did not contribute at all to the foreign issuances in German stock exchanges.

Figure 8 provides a more detailed picture of the countries floating securities on the German stock exchanges between 1883 and 1897. Austria-Hungary was the main issuing country with 89 securities floated, followed with a considerable gap by the United States (43 issues), Italy (42 issues), and Russia (35 issues). However, the size of issues varied considerably across countries. The average size of securities floated was highest for Russia and Mexico, both with 2.2 million pounds, followed by Argentina with 1.8 million pounds. Accordingly, the relative importance of countries in terms of funds obtained from German capital markets is a different one. Russia and Austria-Hungary clearly dominated with 78 and 76 million pounds, respectively, followed by Italy (46 million pounds), and the United States (30 million pounds).

The types of investment between regions also differed substantially, see table 2. Investment in Africa, North America, and South Europe was mainly related to railroad financing, securities issued by Latin American and South-East European countries were mostly government bonds while Asian, i.e., Chinese, securities were exclusively issued by the government. Investment directed towards the banking, industrial, and mortgage sectors played a non-negligible role only in Austria-Hungary, North and Central Europe. As previously pointed out, bonds were the dominant type of securities sold on German stock exchanges. However, equity financing played also a role for applications in North America, North & Central Europe, South Europe, and Africa, especially for railroad projects. Industrial equity was highest in Austria-Hungary and North & Central Europe with roughly 2 million pounds each and bank equity in Austria-Hungary with 2 million pounds. These findings are consistent with some stylized facts in the literature on trade in financial assets. Germany invested predominantly in neighboring countries confirming a common pattern. Portes and Rey (2005) find that a gravity model performs very well in explaining international trade in financial assets. They explain the strong negative correlation between geographical distance and asset trade by informational frictions proxied by distance. The knowledge of neighboring countries is generally higher. However, Portes, Rey and Oh (2001) do not find that equity investments react stronger to informational frictions than bond investments.

In our sample period North America issued equity in Germany while Latin America did

²⁵For a discussion of the Baring crisis, see, e.g., Flores (2007).

not. Likewise, North and Central Europe as well as South Europe issued equity but it played nearly no role for South-East Europe. Thus, we find a tendency that close and more developed countries received more equity investment. This may be due to informational asymmetries being lower for neighboring countries and more developed countries being perceived as less risky. The equity investment into African railroads was nearly exclusively into the Dutch-South African railroad company. The company was founded in the Netherlands but was actually a German company. (Baltzer, 1916) Due to the railroad's location in South Africa it is considered foreign investment in Africa, even though the nationality risk was European. Thus, the investment may have been perceived as less risky thereby strengthening our findings. Daude and Fratzscher (2008) find an actual pecking order in foreign investment determined by informational frictions and institutional quality in the host country. Portfolio investment is much more sensitive to both determinants than direct investments or bank loans. Therefore, FDI and loans dominate investment in less developed countries while portfolio investment is more prevalent in developed countries. However, in our dataset we currently cannot distinguish between portfolio investment and FDI and, therefore, we cannot draw inference in this regard.²⁶

The decision to invest into a foreign security depends also on the asset's riskiness. One risk measure is market liquidity: if assets can be easily sold, the risk is lower. The issuance frequency of a borrower in German stock exchanges is a possible proxy for market liquidity. The more often a borrower issues securities in Germany, the higher the circulation of the borrower's securities and, thus, the more likely significant trade is taking place. Furthermore, investors may have better information on borrowers already present in German financial markets. We next look at the frequency in which countries issued securities in Germany. Thereby, we learn which countries had permanent or only temporary access to German capital markets and get some insights about investors' knowledge of specific countries. Figure 9 accordingly depicts borrowing behavior on German stock exchanges on a yearly basis. The incidence of new issuances varied significantly across countries. While some of the main recipient countries like Austria-Hungary, Italy, and the United States floated securities nearly every year, Russia as one of the main borrowers did not float securities between 1889 and 1893. This, however, was due to political considerations. Between November 1887 and October 1894, the *Reichsbank* was not allowed to accept Russian bonds as collateral for loans, thereby, Russia was indirectly denied access to the German capital market.²⁷ Countries like Switzerland and Sweden floated securities nearly every year even though in absolute terms they were not among the main recipient countries, while other countries like Argentina, China, and Mexico floated securities only during a couple of

²⁶The distinction between portfolio investment and foreign direct investment is not clear-cut. The related literature characterizes the securities intermediated through the stock exchanges as portfolio investment. In contrast, Lane and Milesi-Ferretti (2007) define an equity participation above 10 per cent as FDI. However, this information is not available for our sample. In any case, equity that may be considered FDI or portfolio investment accounts only for 8 per cent of the foreign securities in our sample and the remainder is portfolio investment.

²⁷A more detailed description of the *Lombardverbot* and its implications for financial transactions is provided by, e.g., Feis (1930) and Born (1977).

years but received noteworthy amounts of capital. Yet other countries only floated securities in Germany only once like Algeria, Canada, and Cuba. As we do not have information on denied issuances and amounts issued through other financial centers, we do not know the underlying reasons, i.e., whether a country issued only seldom securities in Germany because of denied access or because no access was requested. Not surprisingly, the majority of securities issued in Germany were rather small in size, both bonds and equity, see figure 10. The large international bonds were in general issued by international syndicates and placed not only in Germany but also in London, Paris and smaller financial centers.

4 The role of external shocks

The foreign securities floated in Germany were mostly issued simultaneously in other countries, especially in the two main financial centers, London and Paris. Hence, the quantity of foreign securities floated in Germany was not only determined by the conditions in the borrowing countries and on German capital markets but also by the conditions in other financial centers, most importantly London and Paris. In this section, we examine if shocks to these other financial centers affected the floatation of foreign securities in Germany.

4.1 The model

Consider a simple partial equilibrium model of the German capital market. There are n countries including Germany, the UK, and France. All countries need funds that are supplied only by the UK, France, and Germany as financial centers. Hence, all the other countries are just borrowers. The German capital market is in equilibrium when the funds demanded equal the funds supplied.

$$\sum_{i=1}^{n-1} D^i(R^G, R^G - R^{UK}, R^G - R^{Fr}, Y^i) + D^G(R^G, R^G - R^{UK}, R^G - R^{Fr}, Y^G) = S^G(R^G, r^G, rp^G)$$

The demand for German funds, D^i , depends on the interest rate R^G at which countries can borrow from Germany and on the interest rate differential between Germany and the UK, $R^G - R^{UK}$, and between Germany and France, $R^G - R^{Fr}$, as countries can alternatively borrow from the UK or France. When the interest rate in Germany is higher than in the UK, for example, the demand shifts towards the British capital market. Therefore, the demand for German funds depends negatively both on the level of the German interest rate and the differentials against the other financial centers. Furthermore, the demand increases with economic activity in the borrower country, Y^i .

Investors in Germany have the alternative between lending to risky domestic or foreign countries/firms at an interest rate R^G and investing at the risk free rate r^G . Hence, the supply of funds in Germany, S^G , depends positively on the risky interest rate and negatively on the risk free interest rate. The risk aversion of German investors and the overall risk of investments

are captured in the term rp^G that determines the degree of substitutability of the risky and the safe asset. We take R^{UK} and R^{Fr} as exogenous. Aggregating the demand for funds of non-German countries, D^F , we obtain the supply of funds to non-German borrowers as follows:

$$D^F(R^G, R^G - R^{UK}, R^G - R^{Fr}, Y^F) = S^G(R^G, r^G, rp^G) - D^G(R^G, R^G - R^{UK}, R^G - R^{Fr}, Y^G)$$

Then, solving for R^G , we obtain a reduced form equation for foreign issuances in Germany:

$$I^G(r^G, rp^G, R^G - R^{UK}, R^G - R^{Fr}, Y^G, Y^F) \quad (1)$$

Hence, foreign issuances depend negatively on the risk free interest rate and the risk term rp^G . When the opportunity cost of the risky investment, the riskiness of the investments themselves, or the risk aversion of German investors increase, foreign issuances are lower. The effect of a change in the interest rate differentials on foreign issuances is ambiguous. An increase in the differential reduces the demand for German funds but increases the supply of funds to non-German borrowers. The relative interest elasticities of demand and supply determine whether the overall effect is positive or negative. An increase in economic activity in the borrower countries increases the demand and, hence, has a positive effect on foreign issuances. An increase in German economic activity, however, reduces the supply of funds to non-German borrowers.

4.2 Estimation

The reduced form equation for foreign issuances in Germany (1) is estimated by regressing the log of the nominal amount of foreign securities issued in Germany each year on the following explanatory variables. We use the private discount rate in Germany as the risk free interest rate.²⁸ The term rp^G capturing both the risk aversion of German investors and the riskiness of investments can be proxied using a variety of indicators. The share of countries defaulting on sovereign debt in a given year measures the aggregate default risk, a higher share implying higher risk. The differential between a long- and a short-term interest rate provides a measure of the term premium, assuming that an increase in the term differential reflects higher risk. The term premium is measured as the difference between the long-term government bond yield and the private discount rate in Germany. A third indicator is the amount of foreign securities issued in Great Britain, the premier financial center, as a proxy of liquidity in financial markets: higher issuances are a sign of higher liquidity and, thus, lower risk. We transform foreign issuances in Great Britain by using the negative value. Then, an increase in each of the three indicators reflects an increase in risk. All indicators have their relative merits and caveats and are correlated. Therefore, instead of choosing one indicator, we derive the principal components

²⁸The private discount rates were the interest rates negotiated in the transactions between credit institutes (Deutsche Bundesbank, 1976). The original interest rates are in nominal terms and are converted into real interest rates by subtracting the inflation rate.

of the three risk indicators and use the first principal component as explanatory variable. The first principal component explains 69 per cent of the total variability of the risk indicators and the second principal component an additional 23 per cent. The first principal component is a roughly equal linear combination of the three risk indicators and can be interpreted as overall investment risk. The first two principal components are illustrated in figure 11. The interest rate differentials between the financial centers are measured with long-term real interest rates obtained by subtracting the inflation rate from the long-term nominal government bond yields. Economic activity in Germany is measured by the GDP growth rate while economic activity in the rest of the world is proxied by the GDP growth rate in the UK. The reason is that the UK was the premier financial center and we assume that when the UK entered a recession, so did the rest of the world. An alternative measure is the growth rate of world exports and is used as a robustness check. The data sources are described in table 3. Figure 12 illustrates the fluctuations in the real interest rate differentials and the private discount rate in Germany, while figure 13a depicts the GDP growth rates in Germany and the UK.

Equation (1) is estimated using Ordinary Least Square (OLS) techniques. Foreign issuances are truncated at zero, however, the log of foreign issuances is not. The advantage of OLS is that the estimated coefficients can be directly interpreted as compared to Tobit estimations. As a robustness check we perform our estimations also for foreign issuances in levels using Tobit techniques. The results of the estimations are reported in table 4 and figure 14 shows the actual series of the log of foreign issuances as well as the fitted values and residuals for specification (1). While column (1) in table 4 is the baseline regression including all the above described variables, the regression in column (2) excludes economic activity in Germany and the UK.

The main insight is that the conditions in financial markets both in Germany and relative to the other financial centers as well as aggregate risk mattered for the amount of foreign securities floated in German stock exchanges. As expected, higher private discount rates in Germany and higher risk discouraged foreign lending in Germany. While an increase in the long-term interest rate in Germany relative to France affected foreign issuances in Germany negatively, the differential between Germany and the UK does not have a statistically significant effect. This can be interpreted as follows. The interest rate semi-elasticity of the demand for funds of non-German borrowers is higher than the interest rate semi-elasticity of supply. Hence, Germany and France seem to be substitutes as financial centers for borrowers. The effect is quite substantial: a one percentage point increase in the interest rate differential decreased foreign issuances by roughly 80 per cent. As the interest differential between Germany and France ranged between -0.2 and 0.8 per cent, the changes in the differential were commonly much smaller than one percentage point, see figure 12. The semi-elasticity of foreign issuances with respect to changes in the interest rate differentials is higher than with respect to changes in the domestic short-term interest rate. This may suggest that foreign shocks mattered more for international issuances than domestic shocks. However, an increase in the differential may

be due to both an increase in German long-term interest rates and a reduction in long-term interest rates in the respective other financial center. Therefore, these estimations do not provide clear guidance in this respect. Furthermore, the small interest rate differentials and their low volatility in figure 12 suggest that the financial centers were highly integrated. Economic activity in Germany and world economic activity, however, are not statistically significant in explaining foreign issuances in Germany.

Thus, only financial conditions seem to matter for the amount of foreign securities floated in Germany and not economic activity, neither in Germany nor in the rest of the world. Together, they explain roughly 45 per cent of the variation in foreign issuances.

4.3 Robustness checks

To check the robustness of our findings, we repeat the estimations for the level of foreign issuances in Germany as dependent variable and use Tobit estimation techniques. The results are reported in table 5. Additionally, instead of using the log of nominal foreign issuances in Germany, we state foreign issuances in real terms and in terms of capital called, respectively. Thereby, we can check if forces related to the overall price level in Germany or to the discount on foreign securities are driving our results. As bonds and equity are fundamentally different types of foreign investment, e.g., with respect to the seniority of lenders and, thus, their riskiness, we run separate regressions for the two types. The estimation results are reported in table 6. Furthermore, we alternatively use the Hodrick-Prescott (HP) filtered deviations from GDP trend to measure economic activity in Germany and proxy world economic activity accordingly by the HP filtered deviations from GDP trend in the UK. Graph 13b illustrates the fluctuations of these variables over the sample period. The detrended data series are smoother than the growth rates; the estimation results, however, are not affected. Another proxy for world economic activity is the growth rate of world exports. The regression results are reported in column (3) in table 4.

In all cases, our results are not affected substantially. Only the estimation for foreign equity performs badly and the variables are neither individually nor jointly significant. This suggests that for the investment in equity other forces than the here mentioned ones are in place. The literature on trade in financial assets finds that distance as a proxy for informational frictions can explain cross-border flows in equity. The inclusion of variables related to distance in the estimations is planned for future research. Furthermore, we are working on including an index describing the taxation of issuances as control variable. As discussed previously, taxes on foreign issuances seem to have been important determinants for the amount of foreign securities floated in Germany and have displaced part of foreign investment to other financial centers.

5 Conclusion

After the political unification in 1871 Germany was an important financial center and the third largest capital exporter at the turn of the 20th century. German foreign lending was predominantly directed towards European countries, however, also other regions received substantial funds. While private banks dominated the intermediation of foreign credit in the first half of the 19th century, they were successively displaced by the joint-stock banks. The broad picture emerging from the present analysis of German foreign investment in the late 19th century is the following. German lending was mainly bond financing and directed towards its neighboring countries. Furthermore, more advanced economies (either perceived or actual) and less distant countries were more likely to additionally float equity in Germany. Thus, informational frictions and the pecking order relevant for trade in financial assets in the late 20th century, seem to have been important already in the 19th century.

Furthermore, we stress the role of Germany as one financial center besides Great Britain and France. Borrowers could choose in which financial center to float their securities and often they issued securities simultaneously in the main financial centers. In the econometric analysis we find that German foreign investment did not only react to conditions in German capital markets but also to interest rate differentials relative to France. When interest rates in Germany increased relative to France, less foreign securities were issued in Germany. Aggregate risk was also an important determinant of foreign investment. However, the present analysis abstracts from investors' choice between financial markets to invest their funds. This may be the subject for future research.

To further spur our understanding of financial globalization at the turn of the 20th century, we are working on extending the present analysis. This includes the extension of the disaggregated data series on foreign securities to span a longer time period and to include a broader set of financial assets. This data will then allow us a more in-depth analysis of the drivers of German foreign investment and the relative importance of Germany as a financial center.

References

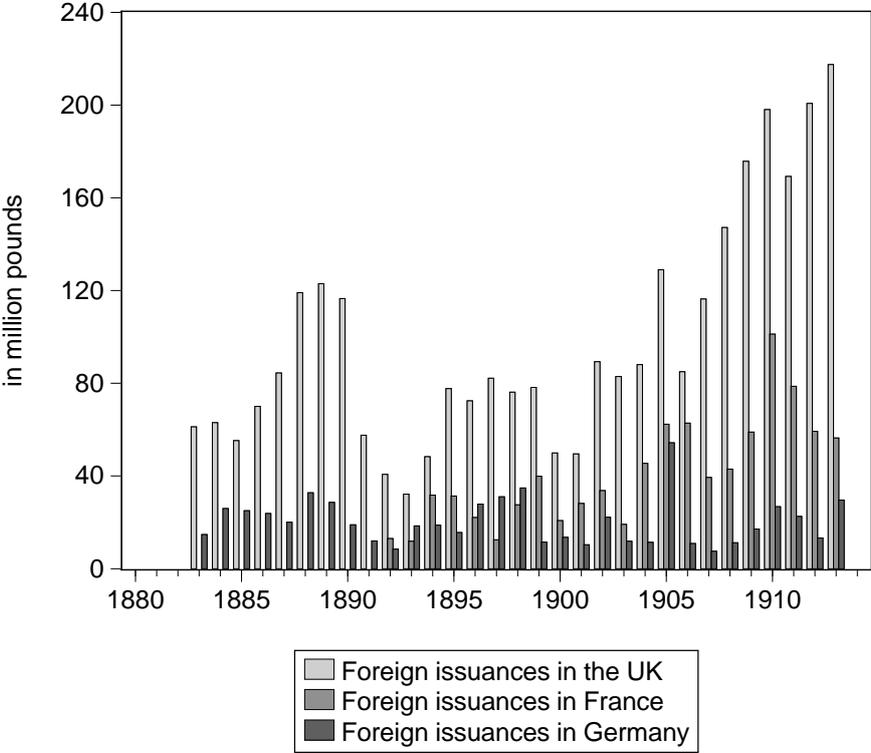
- Baltzer, F. (1916). *Die Kolonialbahnen mit besonderer Berücksichtigung Afrikas*, G. J. Göschen'sche Verlagshandlung, Berlin.
- Bankenquete (1910). *Stenographische Berichte - Die Verhandlungen der Gesamtkommission zu Punkt VI des Fragebogens (Depositenwesen)*, Reichsdruckerei, Berlin.
- Born, K. E. (1977). *Geld und Banken im 19. und 20. Jahrhundert*, A. Kröner, Stuttgart.
- Börsen-Enquete-Kommission (1893). *Statistische Anlagen*, Reichsdruckerei, Berlin.
- Burk, K. (1992). Money and power: the shift from Great Britain to the United States, in Y. Cassis (ed.), *Finance and financiers in European history: 1880-1960*, Cambridge University Press, pp. 359–369.
- Cassis, Y. and Bussière, E. (eds) (2005). *London and Paris as International Financial Centres in the Twentieth Century*, Oxford University Press.
- Daude, C. and Fratzscher, M. (2008). The pecking order of cross-border investment, *Journal of International Economics* **74**(1): 94–119.
- Deutsche Bundesbank (1976). *Deutsches Geld- und Bankwesen in Zahlen 1876-1975*, Frankfurt a. M.
- Esteves, R. P. (2008). Between imperialism and capitalism. European capital exports before 1914, Mimeo, University of Oxford.
- Feis, H. (1930). *Europe the world's banker 1870-1914 - An account of European foreign investment and the connection of world finance with diplomacy before the war*, published for the Council of Foreign Relations, 1964 edn, Reprint of Economic Classics, New York.
- Flandreau, M. and Zumer, F. (2004). *The Making of Global Finance, 1880-1913*, OECD.
- Flores, J.-H. (2007). Information asymmetries and financial intermediation during the Baring crisis: 1880-1890, *Working Paper in Economic History 07-16*, Universidad Carlos III de Madrid.
- Fohlin, C. (2002). Regulation, taxation and the development of the German universal banking system, 1884-1913, *European Review of Economic History* **6**: 221–254.
- Fritzsche, H. (1913). *Ausländische Anleihen auf dem deutschen Geldmarkte*, PhD thesis, Universität Heidelberg, Leipzig.
- Gebhard, H. (1928). *Die Berliner Börse von den Anfängen bis zum Jahre 1896*, R. L. Prager, Berlin.

- Gömmel, R. (1992). Entstehung und Entwicklung der Effektenbörsen im 19. Jahrhundert bis 1914, in H. Pohl (ed.), *Deutsche Börsengeschichte*, Fritz Knapp Verlag, Frankfurt a. M., pp. 133–207.
- Hoffmann, W. G. (1965). *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts*, Springer Verlag, Berlin.
- Jones, M. T. and Obstfeld, M. (2001). Saving, investment, and gold: A reassessment of historical current account data, in G. A. Calvo, R. Dornbusch and M. Obstfeld (eds), *Money, Capital Mobility, and Trade: Essays in Honor of Robert Mundell*, MIT Press, Cambridge, MA, pp. 303–363.
- Kindleberger, C. P. (1974). The formation of financial centers: a study in comparative economic history, Princeton Studies in International Finance No. 36.
- Kleiner, H. (1914). *Emissions-Statistik in Deutschland*, PhD thesis, Ludwig-Maximilians-Universität München.
- Lane, P. R. and Milesi-Ferretti, G. M. (2007). The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities, 1970-2004, *Journal of International Economics* **73**(2): 223–250.
- Lenz, F. (1922). Wesen und Struktur des deutschen Kapitalexports vor 1914, *Weltwirtschaftliches Archiv* **18**(1): 42–54.
- Lotz, W. (1890). Die Technik des deutschen Emissionsgeschäfts - Anleihen, Konversionen und Gründungen, *Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft im Deutschen Reich* **14**: 57–124 (393–460).
- Marx, M. (1913). Die Emissionsstatistik in Deutschland und einigen ausländischen Staaten, *Schmollers Jahrbuch für Gesetzgebung, Verwaltung, und Wirtschaft* **37**(4): 1703–1763.
- Meyer, A. (1902). *Die deutschen Börsensteuern 1881-1900, ihre Geschichte und ihr Einfluss auf das Bankgeschäft*, Union Deutsche Verlagsgesellschaft, Stuttgart.
- Otto, W. (1910). *Anleiheübernahme-, Gründungs- und Beteiligungsgeschäfte der deutschen Grossbanken in Übersee*, Borussia Druck- und Verlagsanstalt, Berlin.
- Pohl, M. (1977). *Deutscher Kapitalexport im 19. Jahrhundert - Emissionen, Banken, Anleger bis 1914*, Erinnerungsgabe zum 25jährigen Bestehen der Börsen-Zeitung, Verlag Börsen-Zeitung.
- Portes, R. and Rey, H. (2005). The determinants of cross-border equity flows, *Journal of International Economics* **65**: 269–296.

- Portes, R., Rey, H. and Oh, Y. (2001). Information and capital flows: The determinants of transactions in financial assets, *European Economic Review* **45**: 783–796.
- Riesser, D. (1912). *Die deutschen Grossbanken und ihre Konzentration im Zusammenhang mit der Entwicklung der Gesamtwirtschaft in Deutschland*, 4th edn, Verlag von Gustav Fischer, Jena.
- Saul, S. (2005). Banking alliances and international issues on the Paris capital market, 1890–1914, in Y. Cassis and E. Bussière (eds), *London and Paris as International Financial Centres in the Twentieth Century*, Oxford University Press, pp. 119–150.
- Schaefer, K. C. (1993). *Deutsche Portfolioinvestitionen im Ausland 1870-1914 - Banken, Kapitalmärkte und Wertpapierhandel im Zeitalter des Imperialismus*, LIT Verlag, Münster.
- Spangenthal, S. (1903). *Die Geschichte der Berliner Börse*, Spangenthal's Verlag, Berlin.
- Standard & Poor's (1999). CreditWeek, December 22.
- Steinmetz, W. (1913). *Die deutschen Großbanken im Dienste des Kapitaleports*, Druckerei der St. Paulus-Gesellschaft, Luxemburg.
- Stone, I. (1999). *The global export of capital from Great Britain, 1865-1914 - A statistical survey*, Macmillan Press Ltd, London.
- Tilly, R. (1992). Der deutsche Kapitalmarkt und die Auslandsinvestitionen von 1870 bis 1913, *IFO Studien* **38**: 199–225.
- Wetzel, C. (1996). *Die Auswirkungen des Reichsbörsengesetzes von 1896 auf die Effektenbörsen im Deutschen Reich, insbesondere auf die Berliner Fondsbörse*, LIT Verlag, Münster.
- Wormser, O. (1919). *Die Frankfurter Börse, ihre Besonderheiten und ihre Bedeutung: Ein Beitrag zur Frage der Börsenkonzentration*, Archiv für Sozialwissenschaft und Sozialpolitik, Verlag von J. C. B. Mohr (Paul Siebeck), Tübingen.
- Zickert, H. (1911). *Die Kapitalsanlage in ausländischen Wertpapieren*, Puttkammer & Mühlbrecht, Berlin.

A Appendix: Figures and tables

Figure 1: Foreign issuances floated in the main financial centers.



Note: Issuance data for France is only available starting in 1892.
Sources: Stone (1999), Saul (2005), and Deutsche Oekonomist.

Table 1: Regional specialization in lending by the German stock exchanges, 1882-1892.

	Berlin		Frankfurt		Hamburg	
	million pounds	share	million pounds	share	million pounds	share
Africa	7.64	95.6%	0.35	4.4%	0.00	0.0%
Asia & Pacific	0.25	100.0%	0.00	0.0%	0.00	0.0%
The Americas	34.62	90.82%	2.55	6.7%	0.98	2.6%
North America	16.71	93.4%	1.12	6.3%	0.06	0.3%
Latin America	17.91	88.4%	1.43	7.0%	0.92	4.6%
Europe	171.45	79.2%	28.93	13.4%	16.15	7.5%
Austria-Hungary	26.20	80.9%	5.58	17.2%	0.60	1.9%
North & Central Europe	10.21	39.5%	3.25	12.6%	12.40	47.9%
Russia	47.35	96.2%	1.41	2.9%	0.44	0.9%
South Europe	53.23	77.7%	12.55	18.3%	2.70	3.9%
South-East Europe	34.47	84.9%	6.13	15.1%	0.00	0.0%
Total	213.96	81.4%	31.82	12.1%	17.13	6.5%

Source: Börsen-Enquete-Kommission (1893) and authors' calculations.

These amounts were taxed at the respective stock exchanges and most likely were also issued there. The shares are relative to the overall amount of securities of a specific region taxed in Germany, i.e. either in Berlin, Frankfurt, or Hamburg. The regions are defined as follows. Africa: Egypt and South Africa; Asia & Pacific: China; North America: Canada and USA; Latin America: Argentina, Brazil, Chile, Dominican Republic, and Mexico; North & Central Europe: Denmark, Finland, Luxemburg, Netherlands, Norway, Sweden, Switzerland, United Kingdom; South Europe: Italy, Portugal, and Spain; South-East Europe: Greece, Rumania, Serbia, and Turkey. The choice of the regional groupings is based on purely geographical considerations.

Figure 2: Aggregate issuances floated in Germany.

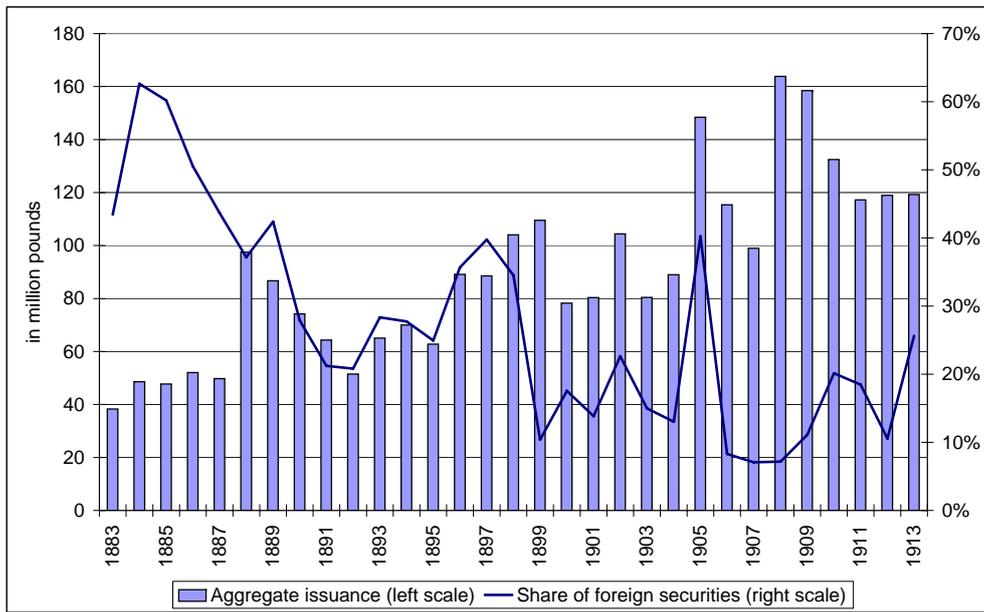


Figure 3: Domestic and foreign issuances floated in Germany.

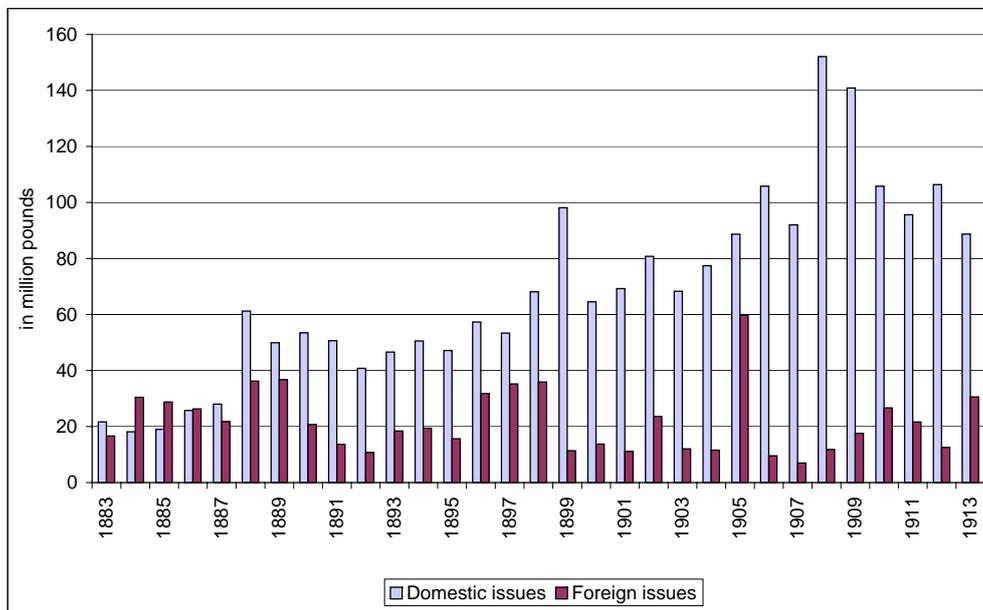


Figure 4: Foreign issues floated in Germany by sector.

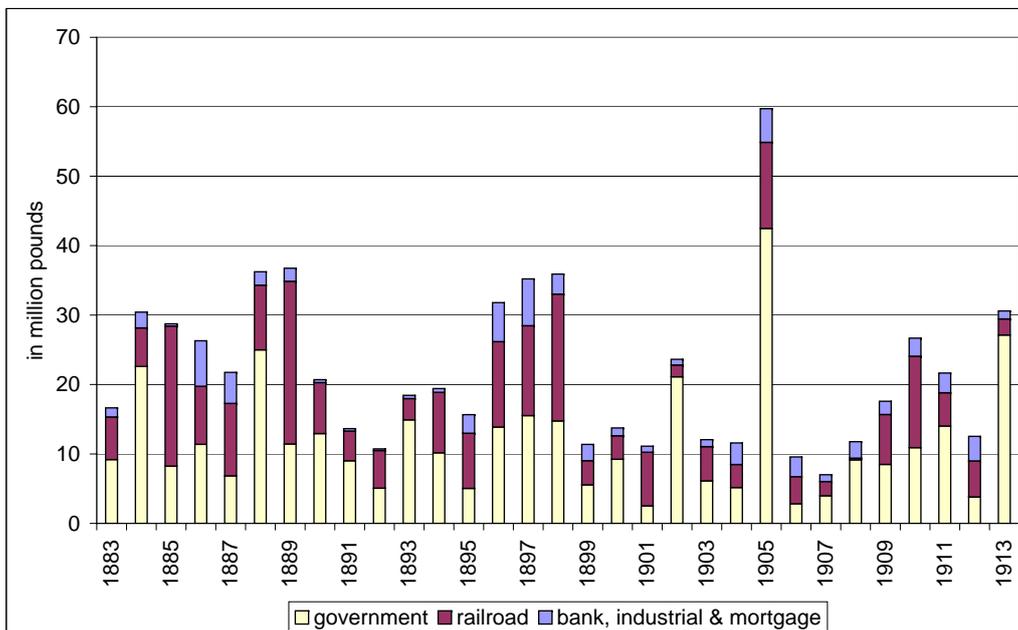


Figure 5: Domestic issues floated in Germany by sector.

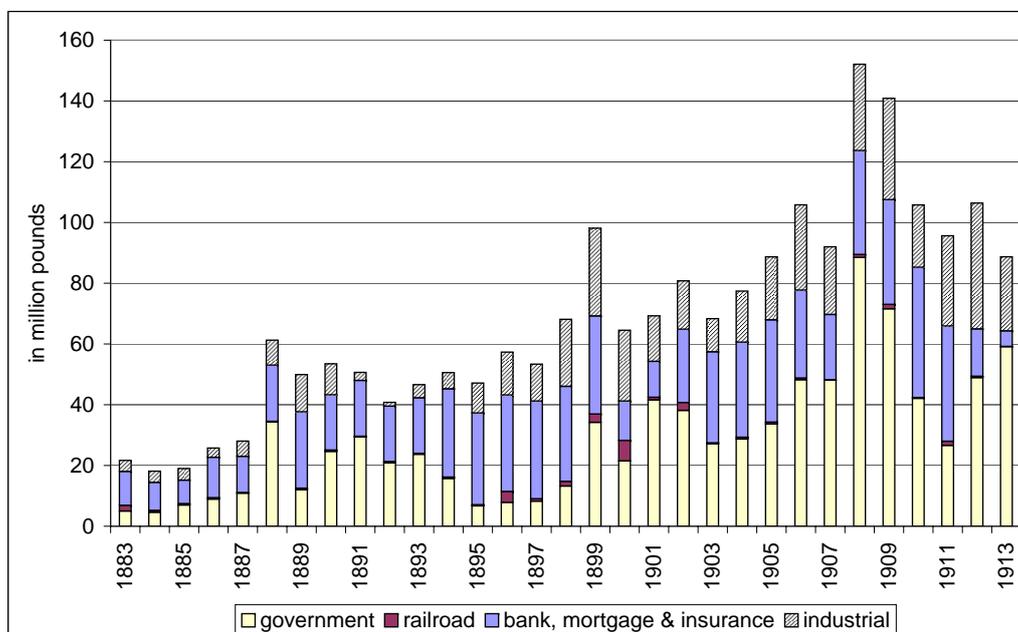


Figure 6: Foreign and domestic issuances: bonds and equity by sectors.

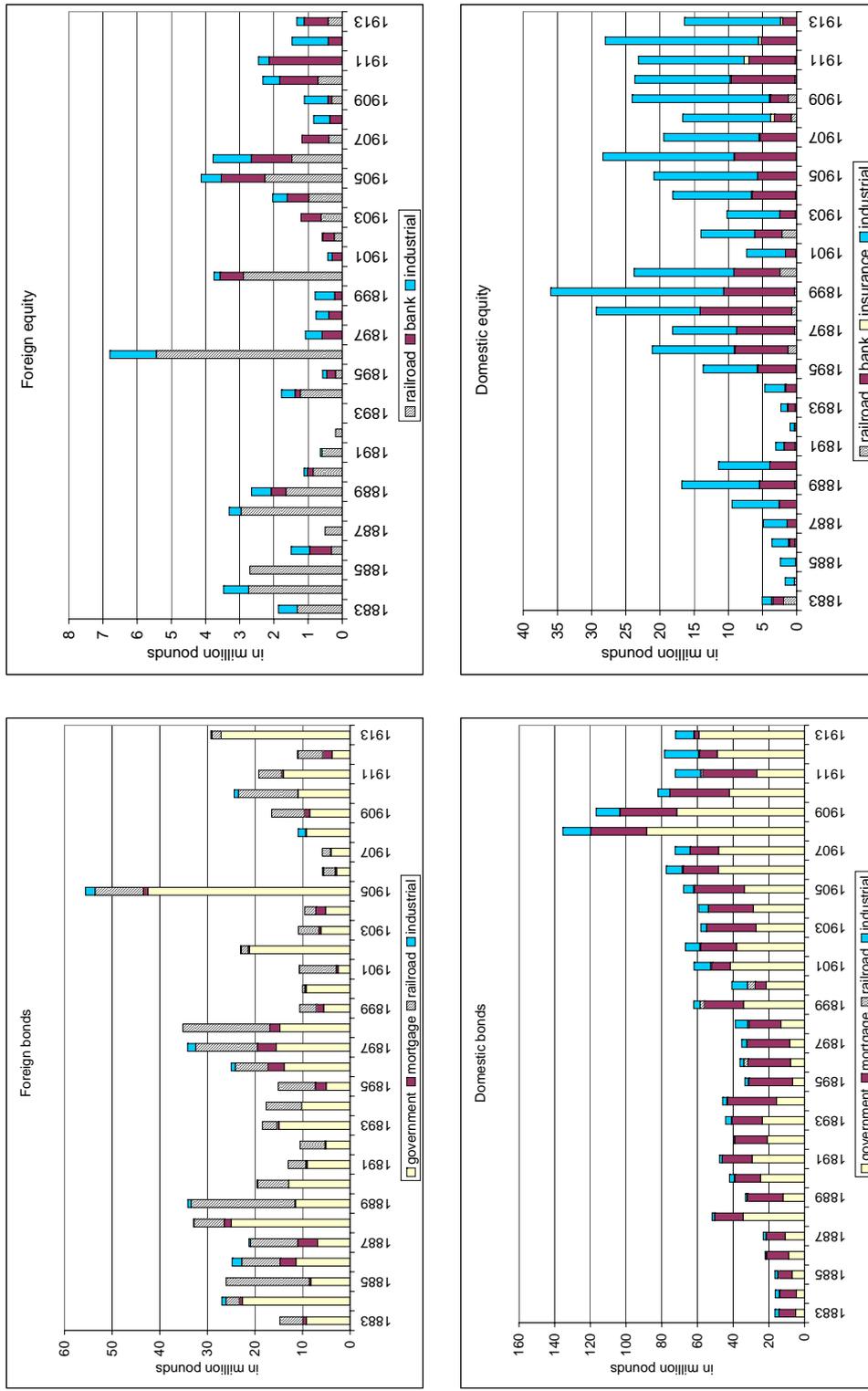


Table 2: Pattern of foreign investment, 1883-1897.

Region	government	railroad	bank, industry & mortgage	bond	equity	as share of total issuances
Africa	25.5%	72.4%	2.1%	86.5%	13.5%	2.2%
Asia & Pacific	100.0%	0.0%	0.0%	100.0%	0.0%	2.6%
The Americas	40.8%	57.0%	2.3%	90.6%	9.4%	15.5%
North America	1.4%	95.9%	2.8%	83.0%	17.0%	8.5%
Latin America	89.1%	9.1%	1.7%	100.0%	0.0%	7.0%
Europe	49.6%	37.4%	13.0%	91.6%	8.4%	79.7%
Austria-Hungary	49.7%	30.3%	20.0%	91.2%	8.8%	21.3%
North & Central Europe	46.7%	17.1%	36.2%	84.8%	15.2%	9.5%
Russia	49.4%	46.8%	3.8%	94.4%	5.6%	21.8%
South Europe	33.1%	57.2%	9.6%	87.4%	12.6%	15.6%
South-East Europe	74.7%	22.9%	2.4%	98.5%	1.5%	11.5%

Source: Deutsche Oekonomist and authors' calculations.

The regions are defined as follows. Africa: Algeria, Congo, Egypt, and South Africa; Asia & Pacific: China; North America: Canada and USA; Latin America: Argentina, Brazil, Chile, Cuba, Dominican Republic, and Mexico; South Europe: Italy and Portugal; South-East Europe: Bosnia & Herzegovina, Bulgaria, Greece, Rumania, Serbia, Turkey; North & Central Europe: Belgium, Denmark, Finland, Luxemburg, Netherlands, Norway, Sweden, Switzerland, and United Kingdom. The choice of the regional groupings is based on purely geographical considerations.

Figure 7: Foreign securities by regions.

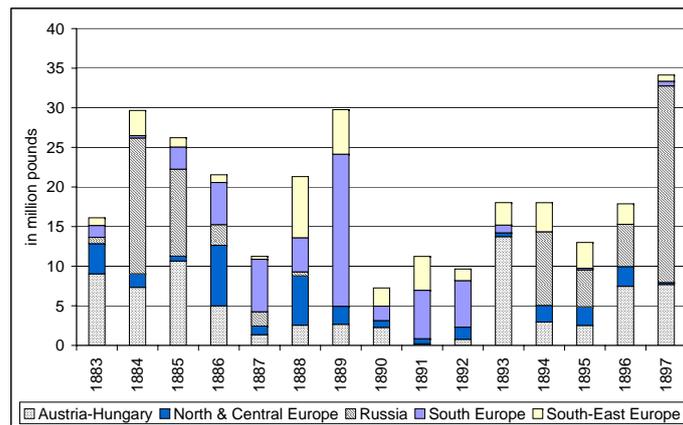
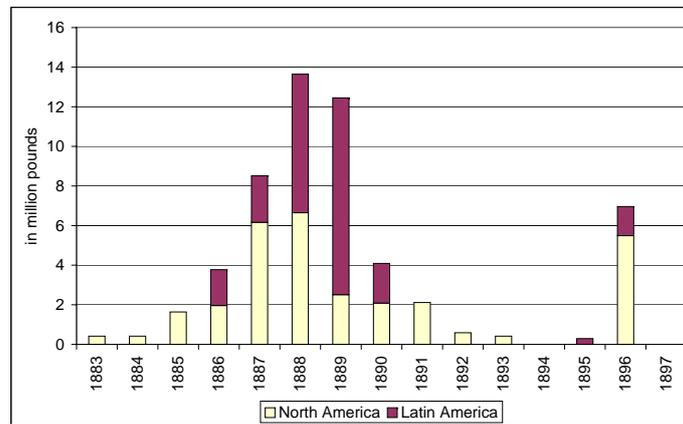
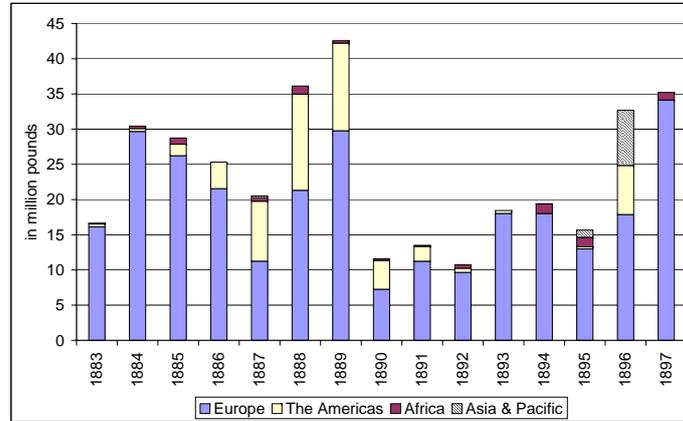


Figure 8: International lending: country composition, 1883-1897.

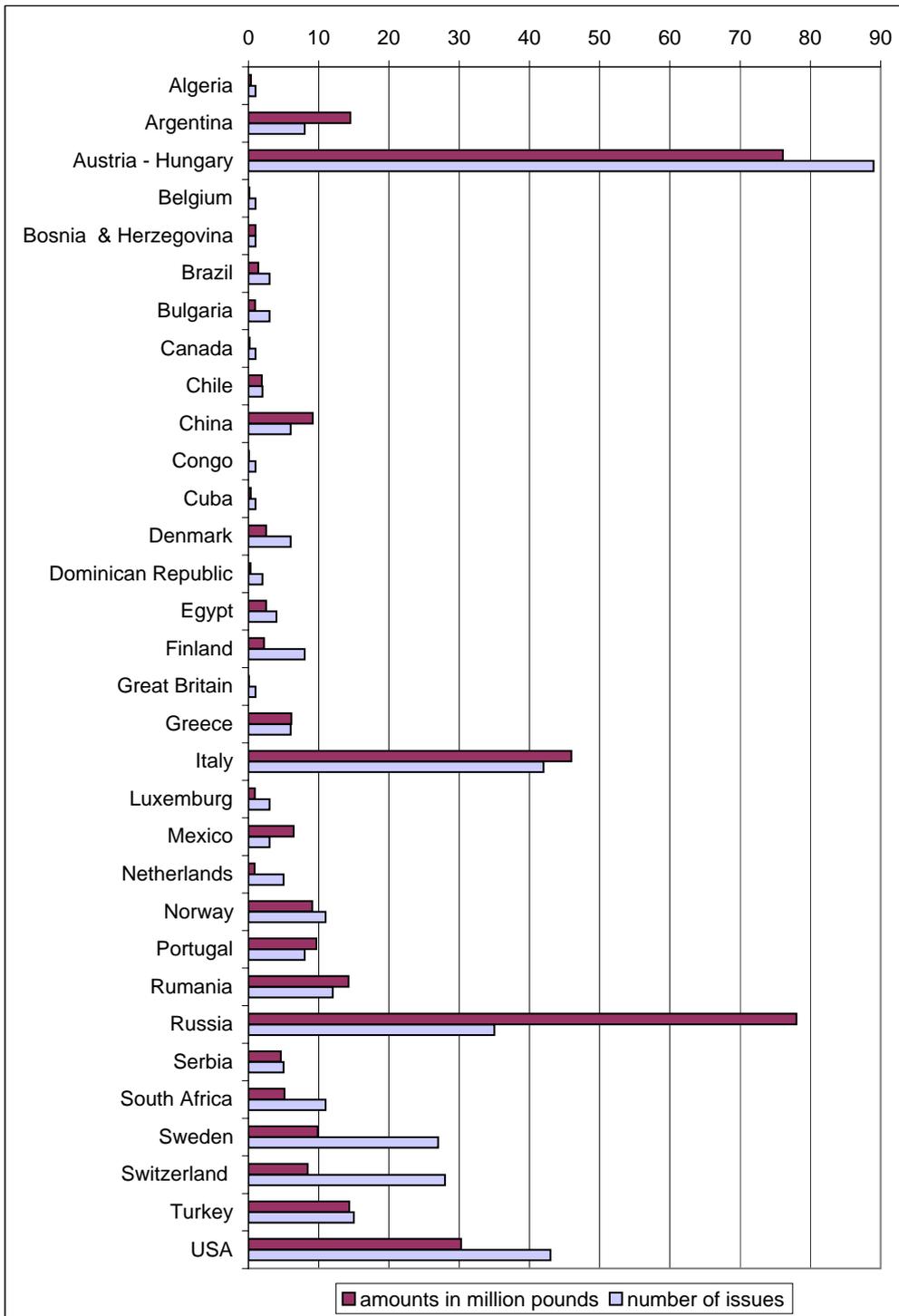


Figure 9: Evolution of lending, 1883-1897.

Country	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897
Algeria															
Argentina															
Austria - Hungary															
Belgium															
Bosnia & Herzegovina															
Brazil															
Bulgaria															
Canada															
Chile															
China															
Congo															
Cuba															
Denmark															
Dominican Republic															
Egypt															
Finland															
Great Britain															
Greece															
Italy															
Luxembourg															
Mexico															
Netherlands															
Norway															
Portugal															
Rumania															
Russia															
Serbia															
South Africa															
Sweden															
Switzerland															
Turkey															
USA															

Note: If the cell is filled out, the country successfully floated issues in Germany that year; if instead it is blank, the country did not float issues in Germany that year.

Figure 10: Size of issues (in million British pounds).

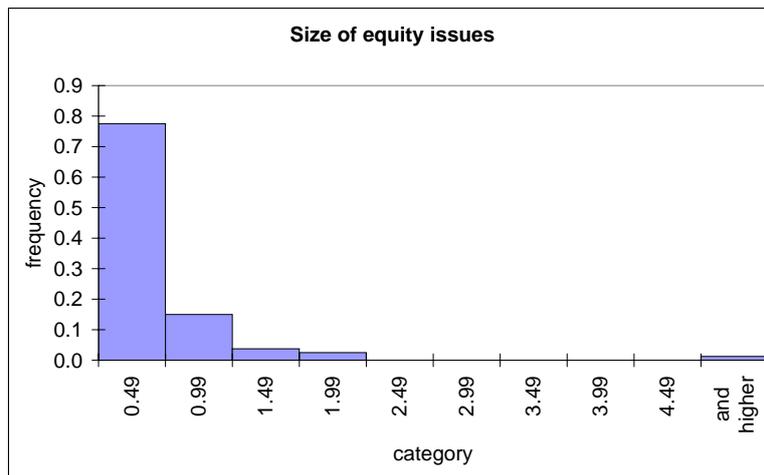
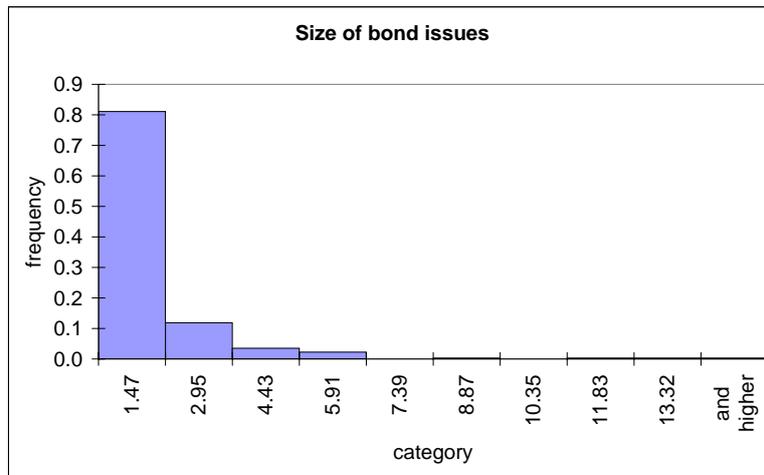


Table 3: Data sources.

Variable	Source
Foreign issuances in Germany	Deutsche Oekonomist, various issues
GDP	Spliced series, Jones and Obstfeld (2001)
World exports	Global Financial Data and authors' calculations
Long-term nominal interest rates	Yield on government gold bonds, Flandreau and Zumer (2004)
Private discount rates	Deutsche Bundesbank (1976)
Inflation rates	General prices, Flandreau and Zumer (2004), and authors' calculations
Foreign issuances in the UK	Stone (1999)
Default risk	Standard & Poor's (1999), and authors' calculations

Figure 11: Principal components of the risk indicators.

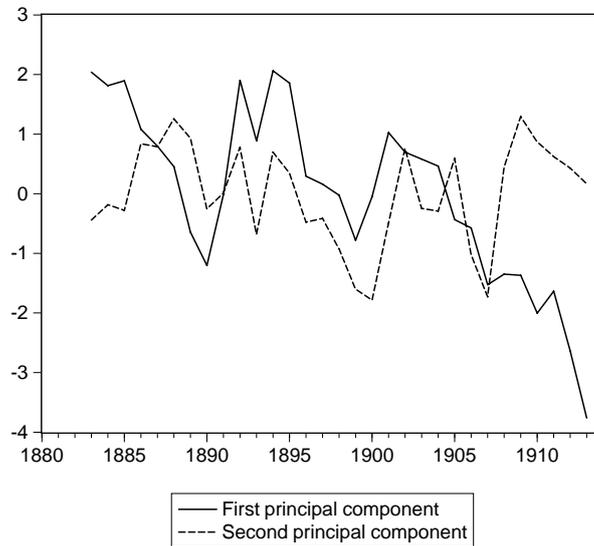


Figure 12: Interest rate differentials and private discount rate.

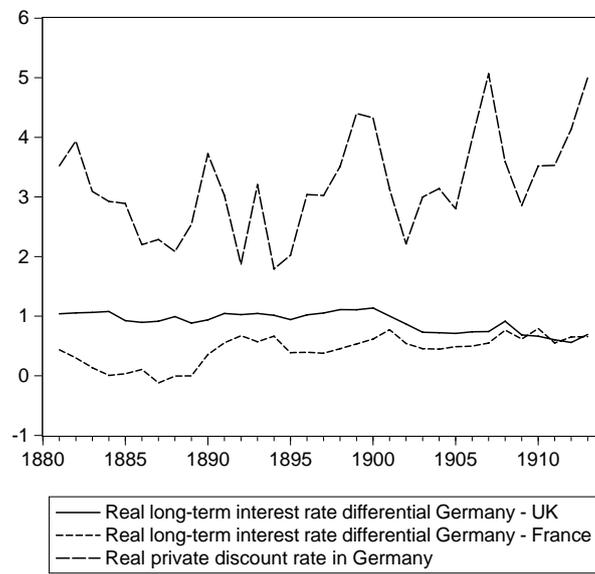
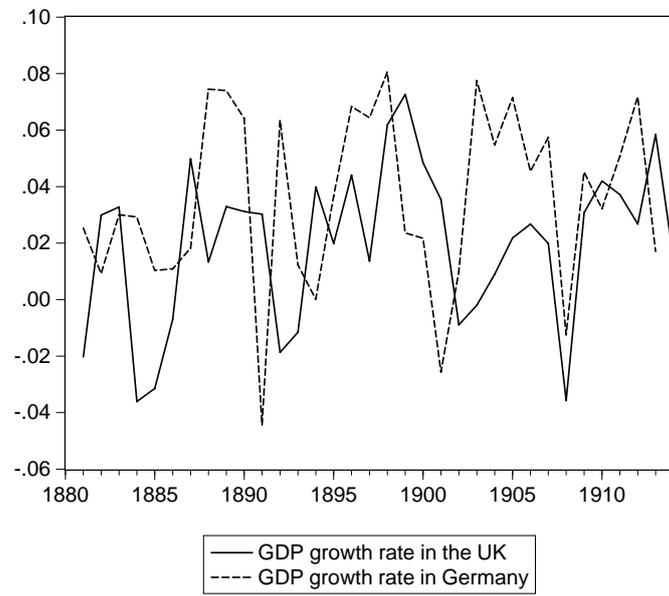


Figure 13: Economic activity in Germany and the UK.

(a) GDP growth rates



(b) HP filtered deviations of GDP from trend

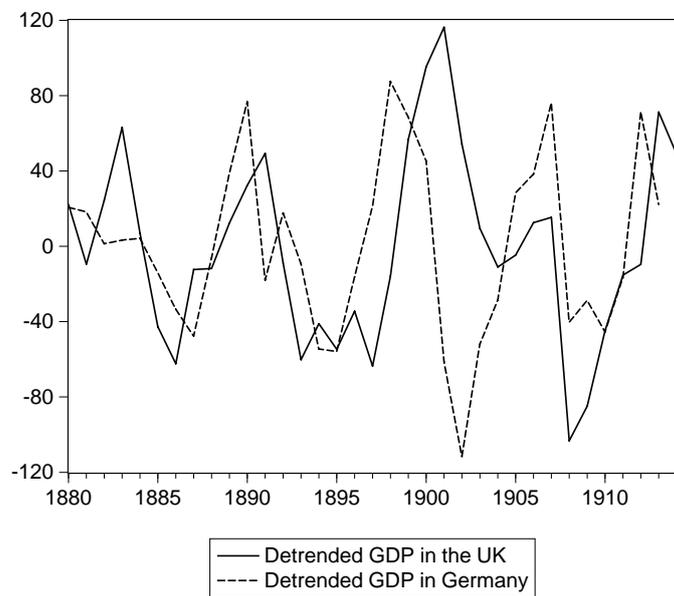


Table 4: OLS regressions.

Dependent variable: log of foreign issuances in Germany	(1)	(2)	(3)
Constant	3.5728*** (0.6508)	3.7778*** (0.6106)	3.7135*** (0.5997)
Growth rate GDP in the UK	0.4053 (2.9896)		
Growth rate GDP in Germany	2.1372 (2.8659)		3.3366 (3.3896)
Growth rate of world exports			-1.7847 (2.1284)
Real long term interest rate differential between Germany and the UK	1.0480 (0.6375)	0.9716 (0.6173)	0.9224 (0.6105)
Real long term interest rate differential between Germany and France	-0.8092** (0.3797)	-0.9008*** (0.2876)	-0.8199** (0.3888)
Real private discount rate in Germany	-0.4065*** (0.1361)	-0.4097*** (0.1240)	-0.4055** (0.1491)
First principal component of risk indicators	-0.2845*** (0.0879)	-0.2991*** (0.0829)	-0.3031*** (0.1055)
R-squared	0.447	0.431	0.456
Adjusted R-squared	0.309	0.343	0.315
Observations	31	31	31
F-statistic (p-value)	3.2388 (0.0178)	4.9210 (0.0043)	3.2197 (0.0191)
Durbin-Watson statistic	1.915	1.856	1.793

Note: White robust standard errors reported in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%.

Figure 14: Actual, fitted, and residual series, OLS (1).

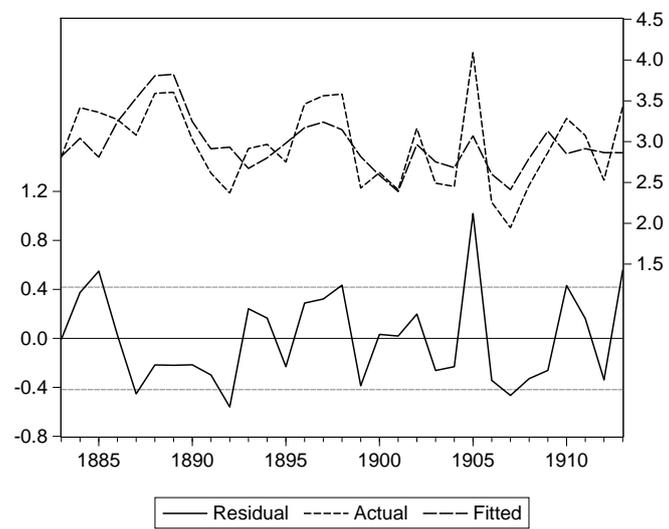


Table 5: Robustness check: Tobit regressions.

Dependent variable: foreign issuances in Germany	(1)	(2)	(3)
Constant	31.709** (13.686)	40.334** (15.650)	33.881*** (12.494)
Growth rate GDP in the UK	-0.705 (51.431)		
Growth rate GDP in Germany	83.846 (57.158)		100.691 (65.022)
Growth rate of world exports			-26.441 (38.0157)
Real long term interest rate differential between Germany and the UK	20.138 (12.900)	16.109 (13.778)	17.612 (11.881)
Real long term interest rate differential between Germany and France	-15.219** (7.068)	-18.809*** (5.361)	-15.683** (7.218)
Real private discount rate in Germany	-7.696*** (2.296)	-7.821*** (2.145)	-7.489*** (2.499)
First principal component of risk indicators	-5.618*** (1.534)	-5.987*** (1.429)	-5.671*** (1.815)
Log likelihood	-111.7529	-112.8588	-108.5033
Observations	31	31	31
Likelihood ratio (p-value)	14.5596 (0.024)	12.3477 (0.015)	14.1429 (0.028)

Note: Huber/White robust standard errors reported in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6: Further robustness checks.

Dependent variable: log of foreign issuances in Germany	in real terms	capital called	only bonds	only equity
Constant	3.777*** (0.659)	3.552*** (0.648)	3.566*** (0.669)	0.636 (1.526)
Growth rate GDP in the UK	0.699 (2.992)	1.165 (2.945)	-0.037 (3.105)	1.002 (6.537)
Growth rate GDP in Germany	2.282 (3.045)	1.976 (2.983)	1.689 (2.982)	4.294 (5.597)
Real long term interest rate differential between Germany and the UK	1.221* (0.655)	0.733 (0.631)	1.292* (0.711)	-1.075 (1.191)
Real long term interest rate differential between Germany and France	-0.891** (0.397)	-0.724* (0.399)	-0.800** (0.376)	-1.143 (0.930)
Real private discount rate in Germany	-0.453*** (0.140)	-0.344** (0.135)	-0.499*** (0.144)	0.311 (0.257)
First principal component of risk indicators	-0.262*** (0.091)	-0.250*** (0.083)	-0.338*** (0.102)	0.073 (0.127)
Adjusted R-squared	0.375	0.239	0.334	0.033
Observations	31	31	31	31
F-statistic (p-value)	4.0003 (0.0065)	2.5686 (0.0458)	3.5121 (0.0123)	1.1657 (0.3582)
Durbin-Watson statistic	1.870	1.915	1.945	2.243

Note: Huber/White robust standard errors reported in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%.