International Banks: Re-Agents of Globalization?*

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Preliminary and incomplete: comments welcome

Abstract

We introduce novel data on the near universe of international/cross-border banking activity during the first age of globalization from 1850 to 1914 and show how these financial connections influenced patterns of trade. First, we describe the banking data and show that the distribution of countries 'exporting' banks is very skewed: the top four exporters are responsible for almost 80% of all multinational banks. Second, we show that despite this skewness, there is a significant positive relationship throughout the distribution between an international banking connection and exports using a standard gravity framework. We employ a number of techniques for our observational data to show that endogeneity is unlikely to be driving this effect. Third, we discuss trade diversion, heterogeneity, and the impact of being in the international banking network.

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1 Introduction

The first wave of globalization (1850-1914) witnessed a massive expansion of domestic and international market integration. A series of technological, political and commercial changes underpinned this period of globalization. International banking was a key innovation that reshaped both the international financial system and, we argue, the landscape of global trade. What was the impact of cross-border banking on trade in this period of globalization? How did the network of international banks evolve over time?

While prior research on the growth of trade has focused on innovations such as the steamship, telegraph, and railroad, as well as trade policy, no quantitative empirical studies on the role of a major financial innovation—international banks—have been undertaken. In this paper, we focus on the impact of the extension of international banking networks on the direction and amount of international trade. Among other functions, international banks improved the availability of trade financing, broke down informational barriers to long-distance trade, and connected businesses of disparate nationalities to the global financial system. Thus, international banking could plausibly be considered a "re-agent" of globalization. While this conjecture is not new to either contemporaries or modern business history scholarship, to the best of our knowledge, no one has yet systematically measured and empirically estimated whether international banks were associated with the direction and amount of international trade between 1850 and 1914.[1]

To address this gap in the literature, we digitize "by hand" a novel, large-scale, historical data set on international banking presence in the universe of countries (and colonies) annually throughout the period from 1850 to 1914. With these data we can track the near universe of international banks at the city level. We are able to accurately count the number of branches for that bank in any city and year from Paris to Yokohama and from Freetown to Wagga Wagga. This amounts to over 289,000 city-year-bank observations. We then work to determine the nationality of each bank, which allows us to generate a dataset of "trade" in banking to document the extent to which countries "export" banks to other countries or "import" them from abroad. We pair this information with a bilateral, country-level trade data set based largely on Xu (2019) covering annual exports, geographic, and institutional data at the bilateral country level for well over 85% of global trade in each and every year.

We begin by discussing the construction of our dataset and by giving some historical background. Contemporary observers strongly believed that international banking mattered for market share in destination countries. Indeed, policy makers in Bismarckian Germany

[1]For qualitative overviews and an introduction to the literature on international banking in the period, see Jones (1995); Bovykin, Valeri and Wilkins (1991); Born (1983).

sought to harness the power of its industrially connected financial industry in order to enlarge international markets for manufacturers (Kisling, 2017). Anecdotal and historical evidence is consistent with our econometric specifications.

Figure 1 uses our data to show that the exponential rise in international trade between 1850 and 1914 was accompanied by a similar acceleration of international banking activity. This acceleration consisted of a larger number of international banks, a greater number of countries receiving and sending banks, and an expansion of branch networks within receiving countries. For every year of this period, more countries were connected to international bank networks as importers rather than exporters, although both grew steadily. At the same time, trade between the countries sending and receiving an international bank seems to have grown more rapidly than for country-pairs that did not have such a financial connection.

Our task in this paper is to go beyond these correlations and demonstrate that international banking was a driver of the direction and amount of international trade between 1850 and 1914. Reverse causality and endogeneity are salient concerns. The assertion that banks drive trade must address and attempt to rule out the possibility that trade and other unobserved economic links drove bank location. We tackle endogeneity and selection concerns first by including a rich set of country by year and country pair fixed effects in a standard gravity model of trade.

We test whether being part of the international banking network by either "importing" or "exporting" banks impacts the volumes of bilateral trade. Our baseline approach pools bilateral export data for a large panel of country pairs controling for bilateral trade costs and sending and destination fixed effects as is not standard in the empirical trade literature. We also use within-pair variation by adding country-pair fixed effects to our empirical models. Finding some differences in the impact of banking depending on the identity of the bank exporter, we allow for heterogeneity in the impact of international banking by sending country as well as characteristics of the improting or exporting country.

In addition we use banking activity of geographical neighbors to control for unobservables in a systematic way. We do so by building on a research design related to Card and Krueger (1994) and later generalizations by Holmes (1998) and Dube, Lester and Reich (2010). Conceptually, we exploit variation in foreign banking presence between pairs or groups of sending countries that are very close to each other geographically and are likely to be similar in many respects and to face correlated shocks. Operationally, we focus on countries that share a land border or are within a short distance of each other, like France and Germany, and are exporting to the same destination, like Argentina. After controlling for standard gravity determinants of trade, exporter and importer specific shocks, and annual economic shocks that are correlated within the paired exporters, we argue that the estimated

effect of sharing a multinational bank will not be confounded by localized unobserved factors that would affect both banks and trade.

Using a standard gravity model of international trade suggests that for country pairs where a bank from the exporting country is in the importing country trade roughly 70 log points more. Another specification shows that an additional foreign bank in the destination country is associated, on average, with an 18 log point rise in trade. The density of the banking network mattered too. An additional branch is worth 1 log point higher exports. The impact of banks from major sending countries like Great Britain, Germany and France seems to be comparable to international banks with less global reach. In our matched border sample, as well as a range of other robustness checks, we find similar magnitudes to our baseline arguing that endogeneity is unlikely to be responsible for our findings. Overall it would appear reasonable to conclude that international banking exercised a direct positive influence on the pattern and magnitude of international trade in the later 19th and early 20th century.

Not only is trade higher when a bank from the exporting country is present in the importing country, but also when a bank from the importing country is present in the exporting country. The latter finding is consistent with evidence from recent decades in Claessens, Hassib and Van Horen (2017). They propose a number of mechanisms including a larger pool of funds, informational advantages, and improvements in the contracting environment.[2] At this point we are unable to discriminate between these and other competing hypotheses for the likely channels. Instead we focus on whether direct banking connections mattered. In the historical context, the general of view of the literature is that London was central to trade finance. Our study highlights that no matter how important London might have been at the time, direct connections mattered too.

While foreign banks may have driven trade, we also recognize the possibility of a virtuous circle between trade and bank location. Indeed, previous research (*e.g.*, Battilossi, 2006) shows, and our own dataset confirms, that banking location is partially determined by geographic, political and institutional factors that also drive trade. In comparison to Battilossi (2006) our data and project make three advances. First, our data set are annual instead of for benchmark years. Second, we document bank ownership for many countries not just Great Britain, France and Germany. Finally, we are the only ones to date who have studied the quantitative impact of foreign banks on trade in a globally representative trade dataset.

[2] A number of papers with data from recent decades discuss the potential impact of the information channel including Michalski and Ors (2012), Portes and Rey (2005), Jeger, Haegler and Theiss (1992), and Choi, Park and Tschoegl (1996). Contractual frictions are the main focus of both the theory and empirics in Schmidt-Eisenlohr (2013), Antràs and Foley (2015), and Niepmann and Schmidt-Eisenlohr (2017).

Another relevant facet is the role of London as the central international financial market of the period. Economic historians have long recognized the centrality of London banks in the late 19th century, and the literature tends to suggest that most international trade was financed through the City of London (King, 1936; Michie, 2016; Einzig, 1931). Accominotti and Ugolini (2019) provide a recent survey of trade finance over the long-run emphasizing the central role of London in the second half of the 19th century and the early 20th century. Earlier studies such as Jones (1995), which shows the broad geographic scope of London's banks, only has coarse data (mostly on the continent-level) for the largest banks at benchmark years. While it remains true that the acceptance market in London bolstered international trade for many country pairs, many other countries established more direct connections in the three decades prior to 1914. As our data show, many other neighboring nations and several other nations like Belgium, Russia, the US, Australia and Japan established reciprocal banking relationships that circumvented, or at least complemented in some regard, the London-market. Our data show the extent of these direct connections, and we estimate that they mattered. Interestingly, we are also able to show that two destination markets that share a bank from a particular sending country also have higher trade.

Our findings suggest no specific micro channel for how these financial connections mattered. A lack of historical data is an issue. At this point we are unable to rule out competing theories that argue for banks' impact on information, financing, or financial development. That said, these channels are likely complementary in theory. Which channel mattered more in practice is an empirical question, and we hope future research might shed light on this. At the same time, while the micro story is as yet incomplete, the macro story is significant. We explore, for the first time, a globally representative long-run data set that sheds light on how the international financial system co-evolves with the global economy.

Our paper begins in section 1 by discussing the historical setting and how foreign banks mattered for the global economy according to the historical literature. We provide some specific examples from Germany and other leading sending countries as well. We then introduce our dataset in section 3 and the main patterns we see in section 4. In section 5, we explain our econometric methodology, discuss our baseline results and investigate variations on the baseline specifications. Section 6 provides many robustnesss tests. We conclude in section 7 with some further reflections highlighting how this preliminary research will inspire further work and how our large-scale dataset enhances our knowledge of international banking in the first wave of globalization.

2 Historical Background

In this section, we discuss the motivations for international banking and the existing scholarship on British dominance in the earlier period, followed by German and French entries subsequently. This historical context provides both the conceptual and theoretical motivation for empirical work in subsequent sections.

2.1 Impetus for international banking

The literature on banking internationalization commonly defines three main triggers of banks going abroad, which are true both historically and in the modern day. First, banks follow their clients. By taking advantage of competitive advantages—such as size, reputation, information, customer base, and human capital—in comparison to domestic banks, foreign banks are able to support their clients more efficiently. Second, foreign markets yield higher profit opportunities than the home market, due to institutional and economic advantages, inter alia taxation, externalities and competition, and additional macroeconomic circumstances such as return on capital, economic growth rates and exchange rate risk. Finally, banks go abroad in order to overcome market failures caused by information asymmetries, and to reduce transaction costs. These last sets of reasons are particularly relevant for the dynamics of international trade finance (Buch, 2000; Schmidt-Eisenlohr, 2013).

International correspondents also merit consideration. International correspondent relationships involve arm's length transactions between banks across borders. In the 19th century it was also common for banks to use merchant houses as well as foreign banks as correspondents in foreign markets. Correspondent relationships were often long-term. Correspondents served to manage the foreign balances of a local bank's clients and to guarantee payments for a local bank's clients in the form of "circular" notes (later known as traveler's checks). Prior to the mid-20th century, foreign 'agents' also handled payments and collections on behalf of domestic customers (Merrett, 1995; Accominotti, 2019).

Ostensibly, foreign correspondents obviated the need for launching and managing a costly foreign branch. Reputation and repeat interaction were likely sufficient to sustain such relationships. Merrett (1995) uses a transcation cost economics argument to illustrate how the types of international transactions mattered. For instance, when banks wanted to engage in intermediation services in foreign markets they were more likely to establish a foreign branch. Such services involved firm-specific assets (i.e., knowledge and know-how) and were not suited to arm's length transactions. In this view, correspondents are, at best, substitutes for a foreign branch and, at the micro-level are unlikely to be complementary.

The implications for our empirical results are discussed further below.

2.2 Early dominance by Great Britain

The major players of global banking in the late nineteenth and early twentieth centuries were Great Britain, France, and Germany. With the latter two challenging the indisputable dominance of the first from the 1870s (see Figure 3b). All three nations showed different dynamics and strategies of banking internationalization. Some studies suggest that the when, where, and how banks established themselves in foreign markets was influenced by institutional and socio-economic conditions such as political stability, and the institutional and legal similarity of home and destination countries. Emerging investment opportunities and engagement in trade finance are commonly also defined as decisive force in banks crossing national borders (Cerutti, Dell'Ariccia and Martínez Pería, 2005; Battilossi, 2006; Kisling, 2017).

The qualitative evidence suggests that British banking internationalization after the 1850s was motivated by a "gravitational pull effect", emerging from increasing trade and investments in the prospering peripheral markets and British colonies (Jones, 1995). Until the second half of the nineteenth century, British trade and its financing were managed—besides some minor pioneering efforts—by the merchant houses that maintained offices in England and abroad. While British capital markets had overtaken the Netherlands' in the early 19th century in terms of size and centrality, the early dominance was in sovereign lending and equity markets (Neal, 1993). British trade and investment accelerated from the 1860s, and banks became indispensable to managing the increasing amount of associated financial transactions (Hurley, 1914).

Somewhat building on the existing network of merchant houses in the world, the banks were designed as "free standing" organizations that maintained legal and institutional connection to the homeland, promising more direct control in absence of reliable domestic institutions in the foreign markets, and benefiting from preferential access to the London capital market (Riesser and Jacobson, 1911). Besides being better suited to managing the increasing capital movements, British banks also released the merchant houses from the necessity to maintain expensive representation abroad, and thus, enabled smaller firms to enter into foreign trade business. Moreover, prevailing conditions in their home country triggered British banks to go abroad. In 1857–58, the British parliament passed two company acts that extended the privilege of incorporation with limited liability to banks, leading to a boom of joint-stock bank foundations, with many of them aiming for foreign markets (Hurley, 1914; Young, 1991; Briones and Villela, 2006).

The major challenge to many nations' during the first globalization was Great Britain's "financial supremacy" (to use the term from (Einzig, 1931)). At that time, London was the center of international payments and of trade finance, and contemporaries claimed that other nations had to rely nearly entirely on the intermediary of English banks to finance their trade with foreign countries (see for example Hauser (1906); Frankfurter Zeitung (1915)). The financial dominance of Great Britain derived most importantly from two facts. First, with the pound sterling at the head of the international monetary system, Great Britain possessed the most stable and internationally accepted currency in the world. Second, London possessed a unique position in the banking world. The old, established British banking houses were considered to be trustworthy, experienced in international banking and enjoyed a high international reputation.[3] The principal tool of trade finance at that time were the bills of exchange, which when originated by banks, were also traded on a liquid secondary market in London. Those bills were known as bankers' acceptances, and English law stipulated that the "acceptor" (the bank) guaranteed the bills in the case of the original borrower's default. This protection essentially meant that the bills reflected the credit risk of the individual banks, which was much more easily observable. The fact that almost all British multinational banks had access to the Bank of England's discount window had the additional benefit that bills guaranteed by these banks were considered the safest assets in the London money market and traded at a premium (Xu, 2019, 2018).

2.3 Later entries by Germany, France, and Beyond

Other nations were by comparison, late to the game. It was not before the mid 1880s that Germany established its first (successful) overseas banks. The principal purpose of the Auslandsbanken (foreign banks) was to (i) conduct German foreign investment and (ii) provide financial and informational assistance for German trade and industries abroad (Hauser, 1906; Riesser and Jacobson, 1911; Hertner, 1990). However, although, German banks participated to some extent in investment banking in foreign markets (Young, 1991), the primary motivation for German banks to go abroad was commercial interests (Hurley, 1914; Lange, 1926; Forbes, 1978; Tilly, 1992).

In their effort to establish an independent financial network, German banks applied three principal approaches to enter foreign markets. (i) Entering into partnerships with foreign private banks (e.g., via Kommandite), (ii) the establishment of close relations to foreign banking firms, (iii) and the creation of affiliated foreign banks as subsidiary companies;

[3]Moreover, they were able to narrow their profit margins considerably in comparison with banks of other nations, as London showed a larger banking turnover than any other financial center at this time (Einzig, 1931).

the Auslandsbanken (Whale, 1930; Strassser, 1924). The principal purpose of the first two was to strengthen commercial relations with countries already disposing of well-developed financial institutions. In regions showing less development in financial terms and in maintaining commercial relations with Germany, German banks aspired to obtain more direct and distinctive control and created subsidiary banks (Whale, 1930 pp. 68-69). The latter were wholly-owned subsidiaries, controlled entirely by their mother institutions—the private joint-stock banks (Grossbanken) that made their knowledge, human resources, and capital available abroad (Kisling, 2017).

Though London's dominance was not seriously challenged, the German international banks' principal financial instrument was the foreign bill. Direct credit, granted to affiliated enterprises and other clients, gained constantly in importance in the financing of trade by German banks. German banks were cited by contemporaries as providing more favorable terms than British banks. For example, in Brazil, direct credits were solely given in the national Brazilian currency, the Milreis, and hence minimized exchange rate risks for borrowers (Kisling, 2019).

The major destinations for German foreign banks after 1870 were largely in Europe. Yet, at the same time, Germany managed to create its own network of overseas banking that stood in direct competition with the British banks.[4] Following the initial step of gaining some independence from the London market and making headway in neighboring European countries, German bank expansion focused more on the emerging periphery in the late nineteenth century, particularly the South American and Asian regions ((Riesser and Jacobson, 1911; Forbes, 1978)). According to our data, German banks were present in over 25 countries/colonies by 1910 with an extensive branch system.

In contrast to Germany, France lacked a foreign banking strategy. French banks, with minor exceptions, focused on the geographically closer, less developed countries of the European periphery and on its colonies (Battilossi, 2006). Instead of focusing on the financing of overseas trade, French banks seemed to show more interest in the business opportunities and benefits deriving from operating and investing in the main European centers, such as Paris, Brussels, and Geneva. The existing overseas banks concentrated on the French colonies. These accounted for 10 out of the 30 countries/colonies in which French banks had presence as of 1913. French banks were only marginally engaged in trade finance.[5] Indeed, this lack of motivation for financing trade is commonly seen by literature as one of the main

[4] One of the first Auslandsbanken was established in London in 1870, a subsidiary of the Deutsche Bank. Soon other European countries followed, such as the Netherlands (Amsterdamsche Bank) in 1871 or Italy in 1894 (Banco Commerciale Italiana).

[5] See Bonin (1991) on French banks. He estimates that the acceptance market was only 1/8 the size of the London market in the late 19th century.

reasons French international trade developed relatively slowly at that time (Battilossi, 2006).

As the 20th century opened, other countries were also increasingly interested in expanding their overseas banking operations. By 1910 the largest bank by country presence according to our data set was the Hong Kong Shanghai Bank (HSBC) head quartered in Hong Kong and specializing in East Asian international trade. Founded in 1865, HSBC capitalized on colonial and local connections to expand quickly opening immediately in Shanghai 1865 and then in Japan by 1866.

The United States, Canada, Australia, Belgium, and Japan also launched dozens of international banks in the late 19th and early 20th century. Several Canadian banks were present in the Caribbean basin. The Belgian Société Générale established intricate connections with many international businesses in the shipping and transportation sector, promoting many large-scale industrial and infrastructure projects. In the early 20th century a handful of other publicly listed and private Belgian banks entered the field.

The United States sat on the sidelines during most of this period partially because of a restrictive regulatory environment that prohibited national banks from having overseas branches. The most significant international bank from the United States prior to the establishment of the Federal Reserve in late 1913, was the International Banking Corporation (IBC). The IBC was chartered in Connecticut and founded in 1901 gaining presence with 16 international branches in eight countries as of 1913. The IBC initially specialized in U.S. government transactions adn eventually in bankers' acceptances (post-1913) as well as credit reporting (Bridges, 2020). Another major international bank was the Japanese Yokohama Specie Bank formed in 1880. The Yokohama Specie Bank expanded operations to East Asia, North America and Europe facilitating public and private international transactions for Japan. According to our data, in 1913, this bank had 19 branches in five countries/colonies (China, India, USA, France, and Hong Kong) in addition to its London office.

3 Data

This paper provides a newly collected and digitized panel of the multinational banks operating in cities around the world from 1850–1914. In this section, we provide an overview of the sources and variables constructed. We provide full details, discuss, and documentation in Appendix B.

3.1 Multinational bank connections

The primary source for the measure of international bank connections is *The Banking Almanac and Directory*, published annually in London starting in the early-mid 19th century.[6] This publication provided British merchants and travelers a guide to the financial markets, and a detailed record of banks operating domestically and abroad.

We hand-collected the city-level listings of individual bank offices from 1850 to 1914 to build a dataset containing over 289,000 observations.[7] Figure 2 shows an example of the source from 1891, where each line in the almanac lists a bank branch in a city and country. Some volumes in later years contain additional information on bank-level characteristics, such as size and capital, for a subset of larger banks but these are not available for the entire panel and therefore are not included here. We standardize bank names in order to track them through the entire panel to account for abbreviations, names recorded in different languages, and misspellings. We assign nationalities based on the location of headquarters (management), the source of their capital, individual bank histories, and the location of their operations, in that order. To our knowledge, this is the first comprehensive attempt to document the national origins of multinational banks in this period.[8] Appendix B provides examples of specific types of decisions that were made. We were able to assign nationalities to over 3,300 unique banks which accounts for 81% of bank level observations and 98% of bank branch observations. Roughly 80% of the observations at the bank-branch level are domestic banks and 84% of the banks in our entire dataset are exclusively domestic.

Using these data of the city-level locations of the banks, we standardize country borders to be consistent with the trade data and generate a directed dyadic panel of "bank" location. We categorize multinational bank connections in three separate ways. First, we measure the direct bilateral connection of whether a country o has "exported" any bank to a country d abroad. We also document the number of unique banks in a country d with headquarters in country o. Finally we count the number of unique city-bank combinations as a proxy for bank export volumes or bank location intensity. We count only one branch for cities and towns with multiple branches.

Second, we calculate the direct bilateral connection of whether a country has "imported" a bank from abroad in the two ways defined above. These two measures of bilateral bank connections allow us to see, for example, if a French bank is in Russia (France is coun-

[6] There is also an American *Bankers' Almanac*, *Merchants' and Bankers' Almanac*, and *Bankers' Almanac and Register*, but these sources are less complete and do not form a full time series.

[7] We have not been able to locate the Almanacs for 1875, 1878, and 1890, and listings were interpolated for those years.

[8] Battilossi (2006) Cite Battilossi for the smaller set he's worked on; German and British bank work; note which ones have released the data.

try o–the exporter of goods), a Russian bank is in France (Russia is country d and d has a bank in o), or both.

3.2 International trade

The country-level panel of bilateral trade from 1850–1914 is taken from Xu (2019), which to our knowledge, is the most comprehensive available of this period. A full discussion of the publicly available sources that were used to compile this dataset is in Appendix B. This panel dataset is unbalanced because observations are only included if there is either non-zero trade in goods or banks. We also collected distance between countries, measured both in terms of geodesic distance in kilometers, and indicators for whether the pair shares a border, a common language, and a colonial connection (direct or indirect with another colony of the same metropole).

4 Geography of international banking

In this section, we discuss general patterns in the data, including banking dominance by a small subset of developed European countries, characteristics of the banks during this period, and characteristics of the countries sending and receiving banks. We introduce our data set of 3,370 unique banks. Overall we have 380 distinct banks that operate in a foreign country for at least one year in our data.

4.1 Concentration in multinational banking

Countries were not equal in their international banking expansion. Figure 3a shows that throughout this period, about half as many countries sent their own banks abroad as the number of countries that received them. Among the countries that exported their banks, Figure 3b shows the number of international banks from the dominant countries like Great Britain, France, Germany, Australia, and the United States. Great Britain remains dominant throughout the period and exhibits a significant acceleration in the 1860s and 1870s years before the rest of the other countries begin to grow their international networks. British growth plateaus from 1890 onward with a small resurgence in the 1910s. France accelerated its international drive in the late 1870s and early 1880s with a small surge toward the end of our period of study. Germany's take-off period begins in the late 1870s continuing until the 1890s. Australia, with much smaller numbers of international banks, peaks in the 1880s. Great Britain, France, and Germany are the largest bank exporters at the end of the period.

The distribution of banks operating abroad is very skewed with Great Britain dominating over this period. Figure 4 shows the percentage of bank branches over the entire sample that are operating outside of their domestic country by nationality. British banks dominate overall, followed by banks from France, Hong Kong, Germany, and the USA. This figure shows that after the top handful of sending countries, there is a very long tail, with most countries only exporting a small handful of banks, if that. Just as is true of trade in goods, there is a very prominent extensive margin in the trade in banks.

Tables 3 and 4 show the top destinations for international banks in 1870 and 1910. In the first period, regions connected to the British Empire constituted the vast majority of the top ten destinations. By 1910, France, the USA, India, and Germany are the top four destinations. By 1910 economic size and importance in the global trading network seem to be more relevant for the shape of the international banking network.

Did the leading countries that exported banks co-locate or did they attempt to establish a territorial division? When identified with their sending country, banks from different countries seem to prefer different regions. Table A1 reports χ^2 tests for the null hypothesis that the regional distribution of banks for eight sending countries is independent of the identity of the sending country. We soundly reject the null hypothesis. Table A2 re-runs this test for a smaller set of leading European nations (United Kingdom, Germany, and France). Once again, we reject the null hypothesis. As discussed above, banks from France are more likely to locate in African and Asian colonies. German banks tended to locate more in the Americas and Europe. Banks from the UK were more evenly spread across the regions.

Figure 5 maps the geographic distribution of banks in our data at key dates: 1871, 1886, 1900, and 1913. It shows that there is substantial expansion, both in places that already have banks at the beginning of the period and in those that do not.

5 Impact of banks on trade

In this section, we present the relationship between international banks and exports. We first show the correlation in the data before then turning to different methods of identifying a causal relationship.

5.1 Correlation between banks and trade

There is a strong positive correlation between exports in goods and exports in banks. Figure 6 shows the binscatter where each underlying point is a country's annual rank by both dimensions. For instance, the United Kingdom is ranked first in both for almost the entire

period, from 1870 through 1912. In 1870, France is the second-largest exporter, and sixth in bank exports; by 1890, it is the fourth-largest exporter but second in bank exports. This correlation in rank is unsurprising for the countries in the front of the rankings, but it is not obvious that the correlation would persist down the rankings.

Figure 7 shows the correlation in terms of volumes of both, controlling for country size and the distance between countries and shows the same strong relationship. We formalize this positive relationship in the next subsection.

5.1.1 Gravity relationship

We estimate a structural gravity equation to formalize the correlation shown in Figure 7 to quantify the effect of having banks in common after controlling for a variety of factors known to affect trade volumes. In the baseline specification in equation (1), we follow the fixed effects methodology discussed in Head and Mayer (2014) rather than controlling directly for time-varying country-level characteristics such as GDP. These fixed effects–at the importer and exporter by year level–enable us to control for the "mulilateral resistance" terms in (Anderson and Van Wincoop, 2003) or other importer and exporter specific terms common to nearly all derivations of structural gravity (Novy, 2013).

Our estimating equation is

$$\ln(\text{EX}_{odt}) = \beta \times \mathbb{I}(\text{Bank}_{odt}) + \Gamma' X_{odt} + \gamma_{ot} + \gamma_{dt} + \theta_t \ln(\text{dist}_{od}) + \varepsilon_{odt} \tag{1}$$

where the dependent variable is the log value of exports, EX_{odt} (in nominal pounds sterling), from origin country o to destination country d in year t. β is the coefficient of interest, which estimates the average semi-elasticity of exports values to a bank connection over this period. The main explanatory variable $\mathbb{I}(\text{Bank}_{odt})$ is a directional measure ($odt \neq dot$) for the presence of at least one bank from the origin country in the destination country in a given year t. We also present results for when the destination (i.e., importing country) has a bank in the exporting country denoted as $\mathbb{I}(\text{Bank}_{dot})$ as the key explanatory variable. In alternative specifications, we use the count of the number of distinct banks in a destination and the number of unique city-bank combinations (i.e., number of branches) within a destination country.

We include the standard set of fixed effects for panel gravity regressions, namely γ_{ot} and γ_{dt} which absorb annual country-level shocks for the exporter and importer countries respectively. These fixed effects also absorb the common year shocks using one country as a reference. They also allow us to account for macroeconomic changes in each country in a pair that affect supply and demand at the country level such as total output, average tariffs,

and other national, time-specific economic shocks. We allow the effect of the log geodesic distance between countries ($\ln(\text{dist}_{od})$) to be time-varying to allow for technological changes that may have altered the sensitivity of trade to distance over time. Standard errors are three-way clustered by origin-country, destination-country, and between country-pairs.

The baseline specification allows us to use both cross-sectional and time-series variation, and we report the results in Table 5. The main independent variables of interest in columns 1–6 are different measures of trade in banks based on our new dataset: an indicator for whether any bank from o is present in the destination d, counts of the number of banks "exported" to the trade partner, and the number of branches "exported". In columns 4–6, we present the results for banks belonging to the importer that are located in the exporting country o, measured in the analogous three ways. All specifications include measures of distance between countries such as having ever been part of the same colonial empire, having a shared border, or having a common language. Each banking measure is economically and statistically significant: the presence of at least one bank from o in the destination d is associated with increases in the volume of exports of 72 log points. An extra bank from o in the destination d is associated with a rise in trade of 18 log points, and an extra branch with about a 1 extra log point. Coefficients are slightly smaller for when a bank from the importer d is present in the exporter o: 57, 13, and 1 log point respectively.

Table 6 explores heterogeneity in the impact of country o banks in d by interacting the banking presence indicator variable with indicators for the following exporting countries: Great Britain, France, Germany, the USA and all "other" sending countries. This latter group includes bank sending countries besides the UK, France, Germany, and the USA which have a bank presence in any of those four countries and where the four main countries do not have a bank in the sending country or where a country has a bank in the territory of another trade partner outside of the four main countries. The estimating equation is the same as the baseline in equation (1). Here, as before, the coefficient on the number of banks is positive ranging from 0.07 for France to 0.39 for the "other" group. All coefficients except that for France are statistically significant at better than the 10 percent level. Columns 2 and 3 show that the number of branches is largely positive and significant whether we control for the number of banks or not. Column 4 uses the indicator variable for banking presence which is positive and significant in all cases.

For additional robustness, we also include country-pair fixed effects γ_{od} that absorb all time-invariant characteristics of a country pair as well as country fixed effects. Here we change the dependent variable to the logarithm of the product of bilateral exports which is the preferred functional form for structural gravity (Novy, 2013). This specification also conveniently admits non-directed pair fixed effects which allows us to explore a difference-

in-differences interpretation of bank connections. The specification is explicitly written as

$$\ln(\mathrm{EX}_{odt} \cdot \mathrm{EX}_{dot}) = \beta \times \mathbb{I}(Bank_{odt/dot}) + \gamma_{od} + \gamma_{ot} + \gamma_{dt} + \varepsilon_{odt} \tag{2}$$

The pair fixed effects control for standard gravity measures of distance between countries, such as whether they ever had a colonial link, without estimating them directly. The identifying source of variation in this approach comes from the time series changes to the bank connection between a given importer-exporter pair after absorbing the overall level of trade between the countries. The notation $(Bank_{odt/dot})$ signifies a bank of the exporter o is in destination d or a bank from the destination d is located in o. However, while higher levels of trade between countries are accounted for, these fixed effects alone will not deal with bank presence being confounded by future anticipated *increases* in trade. We explore this immediately below in an event study. For this model, we report that the coefficient of interest, β, is 0.83 with a p-value of 0.00 and a 95% confidence interval of 0.63 to 1.03.

In a specification closely related to equation (2), we explore a flexible event study methodology. Specifcially we estimate

$$\ln(\mathrm{EX}_{odt} \cdot \mathrm{EX}_{dot}) = \sum_{\tau=-6}^{6} \beta_t \times \mathbb{I}(Bank_{odt/dot}) + \gamma_{od} + \gamma_{ot} + \gamma_{dt} + \varepsilon_{odt} \tag{3}$$

This model allows for separate treatment effects for the six years or more before a banking relationship, six years or more after, and each of the five years before and after at least one bank connection within the pair. Country pairs that already have a banking connection by 1850 are included as part of the control group as are countries with no current banking connection. Each coefficient β_t can be interpreted as the impact of a bank connection on pair trade relative to the year prior to having a bank and relative to the control group. The number of pairs in our data with a banking connection as of 1850 is 19 and each of them includes the UK. There are only five such pairs included in the sample control group. We allow for multiple spells within a pair. The omitted period for the event study is the year prior to the establishment of a banking connection.

Figure 8 shows the results for this event study. Trade within a pair appears to be between 50 and 100 log points higher in each period after the establishment of a banking relationship. Prior to the event, the point estimates are not highly significant and are mostly in the range of 0.5. Still, in the two years prior to the event, trade within a pair does seem to be somewhat elevated relative to the control group suggesting the possibility that banks choose destinations with growing trade. Historical studies of individual banks suggest that prior to foreign entry banks established relationships with local banks and merchant houses

which could also explain this finding (Jones, 1995 p. 71). A third possibility is a reporting lag. For instance: the German Brazilian Bank opened in Brazil in 1888 but our data record its appearance as 1891.

Figure 9 presents event studies by nationality of the country sending a bank to the destination. We estimate the event study for the main bank exporting nations: UK, France, Germany and the USA. As before, our fifth group of countries is labeled "other". Results vary by sending country as results in Table 6 have already shown. For the UK, trade is mostly elevated before and after arrival of a bank. This is also the case for France. For Germany, no statistically significant result is visible until at least six years have passed after entry. For the USA, there is no significant effect before or after entry. For the "other" category, trade is estimated to be realtively higher in all years after establishment of a connection. All horizons are statistically significant. For this group "pre-existing" trends in trade patterns are not statistically significant.

5.2 Placebo

In Table 7 we provide a "placebo" test for whether banks matter for trade. The dependent variable is the log level of exports from country o to country d. We include an indicator $\mathbb{I}(Bank_{ndt})$ for whether any near neighbor n of country o has a bank in country d or not. The model in this case is specified as

$$\ln(\text{EX}_{odt}) = \beta_1 \times \mathbb{I}(Bank_{ndt}) + \beta_2 \times \mathbb{I}(Bank_{odt}) + \Gamma' X_{odt} + \gamma_{ot} + \gamma_{dt} + \theta_t \ln(\text{dist})_{od} + \varepsilon_{odt} \quad (4)$$

This regression attempts to control for unobservables at the country-pair level driving bank location and trade. Under the assumption that these unobservables are highly correlated between neighboring sending countries, and that they drive bank location, we have a strong test based on the sign and signficance of the coefficient on a neighboring bank. If we find that the presence of a bank from a neighbor of a country o is positively related to trade between o and d, it is likely that a unobservables at the pair od level and $o'd$ level ($o' \neq o$) are driving both trade and bank location.

We define a neighbor of sending country o as a country that shares a border with country o or which has a great circle distance of less than 450 km as measured in our dataset. This is the distance between France and Great Britain in our data, for example. The coefficient on the indicator equal to 1 when any neighboring country has bank presence in country d is positive, but it is never statistically significant even after controlling for the full set of gravity controls and exporter and importer fixed effects. In column 3 of Table 7, we also include the indicator variable for the presence of a bank from country o in country d.

This table suggests that neither pair specific unobservables nor spatial correlation is likely to be responsible for the positive impact of banks on trade.

These results speak to the issue of trade diversion. Suppose that banks from neighboring countries worked to diminish exports from o to d. Then, we would expect a negative sign on the coefficient for bank presence of neighboring countries. Instead, point estimates on this indicator in all three columns are precisely estimated zeros.

5.3 Near neighbors approach

Table 8 attempts a more rigorous test of our baseline while also controlling carefully for country-pair unobservables. We restrict the control group geographically in order to compare the level of trade between an exporting country o and a destination d to the level of trade between near neighbors of o and the same destination d. Again, the assumption is that exporting countries that are geographically proximate to country o are likely to be highly similar in terms of economic development and institutional background and unobserved shocks are likely to be very similar too. The identifying assumption for estimating an unbiased coefficient on banking presence is that the presence of a bank is uncorrelated with the country pair–period error term. This model uses within region variation to see whether banks are associated with higher trade. The test is similar in spirit to that of Card and Krueger (1994). They assessed whether a minimum wage rise in New Jersey changed employment in fast-food restaurants in New Jersey relative to the change in neighboring counties in Pennsylvania which did not implement a change in the minimum wage. The approach has been generalized by Dube, Lester and Reich (2010) to include a larger set of neighboring counties and a longer span of time. The intuition of the approach is that the control group is better matched to the treatment group since near neighbors are more likely to share common fundamentals and be exposed to similar shocks. The model also evidently helps reassure us that spatial correlation is not leading us to reject the null of no association too easily.

In our case, the data set for a given year consists of a stacked set of bilateral trade observations between country o and country d and exports for all of the near neighbors of country o and the same country d. This enlarges our data set in the following way. Ignoring country d for now, take a country o (e.g., Great Britain). The near neighbors will be France, Belgium and the Netherlands. This set of countries forms a border "group" g. All available export flows between these neighbors in the group with a country d will be included. Now, since a country like France has several other neighbors, France also appears in the dataset being compared against Spain, Belgium, the Netherlands, Germany, Italy, and Switzerland

and so on.

Formally our regression equation is

$$\ln(\text{EX}_{odt}) = \beta \times \mathbb{I}(Bank_{odt}) + \gamma_{gt} + \gamma_{ot} + \gamma_{dt} + \theta_t \ln(\text{dist})_{od} + \varepsilon_{odt} \tag{5}$$

where the variables are defined as before. Here β is still the coefficient of interest and estimates the effect of a direct bank connection on exports. Note that with this specification we are able to include a fixed effect for the g groups of bordering countries. This effect can be time invariant γ_g or time variant, γ_{gt}. When we include a (time-invariant) fixed effect at the group level we are using within-group variation. This variation means that we are de-meaning the data within the group to ask whether trade for any pair od within the group is different from the long-run within–group average as the banking indicator varies. For example, for the group described above with Great Britain as the exporter, assume that trade is high between all countries (GB and its near neighbors) with the destination d for unobservable reasons. Even if banks do not in fact promote trade, β will likely be positive and significant in the baseline model. In this alternative specification, after netting out the average (higher) levels of trade between this group of countries and the destination, we are likely to find a zero β effect instead since this model controls for the unobservable shocks and drivers that are correlated with banking connections.

Adding a time dimension to the data allows an even richer set of group by year fixed effects. With the group by year fixed effect, γ_{gt}, we use only cross-sectional variation within a group within a year. Multi-way clustering is necessary in this setup since countries appear multiple times and specific pairs do as well. We cluster at the country o, country d, and the cluster g–level.

Table 8 shows that our three preferred controls for bank presence of o in country d are statistically significant and positive in this setup. Our point estimates for the variable indicating whether a bank from o exists in d in column 1 which includes only border group fixed effects is 0.46 – about half the size of the coefficient in Table 5. In column 2, which includes pair-by-year fixed effects, it is 0.65 – roughly equal in magnitude to the coefficient in Table 5 column 1. Both coefficients are highly statistically significant. Column 3 shows that the coefficient on the number of banks of 0.24 is slightly larger in magnitude than the coefficient on the same variable in column 1 of Table 5. We conclude that unobservables at the country-pair (od) level and unobservables that are spatially correlated are unlikely to be the reason trade is higher between country pairs where the exporting country has a bank in the importing country.

5.4 Heterogeneity and Interactions

Table 9 interacts the indicator, $\mathbb{I}(\text{Bank}_{odt})$ with a range of observable variables. Column (2) shows that foreign banks may have had a bigger impact on trade when locating in more distant markets. The main effect for a bank connection is -4 but the total effect rises to become positive at a (log) distance of about 1000 kilometers. More than 90% of pairs in our sample have a distance greater than this value. At the average distance of about 4,000 kilometers, the total effect equals 0.73 and is statistically significant.

Local financial development may interact with international banks (columns 6 and 7). We first proxy financial development as the number of domestic bank branches in coutnry d in our data set per million people. The main effect in column (6) is 0.35 and the interaction term is 0.007. At the median of 7 branches per million residents, the total marginal effect of bank o presence in d is equal to 0.39.

In column (7), the interaction term with the number of domestic banks per million population is negative but not statistically significant. In this model, the coefficient on the un-interacted o bank in d indicator is much larger than in the baseline (0.73 vs. 0.57). This difference suggests there may be a negative correlation between the scaled number of (domestic) banks based from d and foreign bank entry. Foreign entry by o into d may be likely in countries with more domestic banks per capita. Both results in column (6) and (7) imply that foreign banks are more likely to locate in and promote trade when competition from domestic banks is lower.

We also find globally prominent banks have a larger association with bilateral trade than smaller banks. In columns (8) and (9) we interact the bank presence indicator with the two indicators for the global reach of foreign banks. The main effect is now 0.37 which is 35% smaller than in column (1). The interaction effect for a major bank, classified as being in the top 25th percentile of global branches, seems to increase the impact of a bank connection by 45 log points. The total effect equals 0.82 in this case. Neither the main effect nor the interaction term are highly significant. In this model, the main effect is 0.37, which is 35 percent smaller than the baseline in column (1). The interaction term with the indicator for a major foreign bank (column 9) measured by the number of countries in which the bank has presence is not statistically significant.

Competition from banks from other foreign countries reduces the association between banks from o in d and exports to the destination. Entry from other countries and banks from other countries lead to a sort of trade diversion. The interaction term for the number of banks from other foreign countries present in d is negative and significant at the 10% level. At the median (mean) of 32 (59) banks from other countries, the total effect is 0.79

(0.69) which is a reduction from the main effect of 0.92. At the median (mean) of 4 (4.5) other countries present in d, the total effect is 0.71 (0.65) which is a reduction from the main (un-interacted) effect of 1.19.

The coefficient on foreign bank connections also depends on the destination region. The point estimate on a banking connection is much larger in Oceania (2.94; p-value = 0.0) than in Europe (-0.13, p-value = 0.56). The coefficients in Africa, the Americas, and Asia are all significant and are 0.64 (Americas); 1.1 (Africa); and 1.14 (Asia) These findings are somewhat consistent with our findings about how distance matters in column (2) and the fact that well over half of the foreign banks in our sample originate in European countries.

We also find that the coefficient on the bank presence indicator varies by period and sending country. In Figure A3 we interact the bank presence indicator with the sending country and decade controls. We have one final period 1910-1914 which is less than a decade. The sending countries are the UK, Germany, France, USA and the "other" category. For most countries, the coefficients for earlier periods, are not highly statistically significant. By 1900 coefficients for all of the major countries are positive and significant at conventional levels of significance. For the UK and Germany, point estimates seem to rise over time while for France, the US, and "other" sending countries, the point estimates fall.

5.5 Trade Diversion and Competition between Leading Countries

Above, we found that the coefficient on the indicator for bank presence by a "neighbor" is never a statistically significant determinant of exports from o to d. This placebo test of the impact of a neighbor's bank on trade between o and d sheds some light on trade diversion. If this coefficient were estimated to be negative, it would be consistent with the idea that a neighboring country's bank reduced trade between o and d. Here we implement a number of other tests that allow more insight into international competition, complementarity and trade diversion especially between the leading economic powers of the time.

In Table 10 we investigate whether banks from major countries (UK, France, and Germany) diverted trade away from other major countries. We have four specifications.

The first test checks whether exports from two major countries to any destination d are lower when the third country in the set has a bank in d. Do German banks discourage exports from the UK (or France) to a destination? It is unlikely. None of the three interaction terms is statistically significant. All results control for whether a country has a bank in d but do not interact this control with the other term.

Our second test includes this interaction term allowing us to check whether there are complementarities (positive or negative) when at least two of the three major powers

have banks in the destination d. For example: do banks from France offset the potential trade diversion of German banking presence? Only one of three coefficients of interest is significant. This term suggests that German banks may diminish the positive relationship between UK exports and UK banks.

Third, we study whether the number of banks from the two other major countries is associated with lower trade after controlling for the number of banks from country o. This specification in column (3) is comparable to column (1) in spirit, but it substitutes a bank presence indicator for the number of banks. An example: do British exports to d decrease in the number of German banks in d after controlling for the number of British banks? We indeed find that more German banks are associated with lower British and French exports to d and more French banks are associated with lower German and British exports to d. Each additional bank from Germany (or France) is associated with a one (or two) log point decline in exports for the other two countries in the set. On the other hand, British banks seem to promote trade between Germany and France and destination d. These results are somewhat at odds with our null finding for near neighbors although the results in column (1) are consistent with those findings. Of course the evidence from our near neighbor models come from many other data points suggesting these results may be specific to these leading nations.

Column 4 adds one more interaction between the number of o banks and the number of banks from the competitor. Does adding more banks from o offset the potential diversion from other entrants? For instance, when studying German exports to d does the coefficient on the number of German banks decline when more British banks are present? Apparently not. All of these interaction terms are either very small or not statistically significant. Our bottom line is that competition between leading powers was not zero-sum in terms of creating trade opportunities. From these specifications, spillovers between the powers were small or very limited in terms of economic significance.

5.6 Connections via Third Country International Banks

Did the network of global banks itself promote trade? In Table 11 we ask whether countries that are connected by a bank from a third country trade more. For instance, if HSBC, a bank based in Hong Kong, sets up a branch in both Japan and the US, do Japan and the US trade more? We add an indicator for such connections and also control for direct banking connections between the o and d. We have four tests.

First, in column 1 we show that when two countries are connected by a bank from a third country country o tends to export more to country d. This holds true even after

controlling for the presence of a bank from o in d. Next, in columns (2) and (3) we check whether the impact of a third country bank is affected by whether this bank in the top 25th percentile of international banks ranked by country presence or number of global branches. We include an interaction term that indicates when the connection consists of at least one bank with such a ranking. There is some evidence that this type of connection matters in a negative way. The coefficient on the connection indicator in column (2) equals 0.53 (p-value = 0.00) but the total effect falls to about 0.13 when a major bank is involved. This is also suggestive of trade diversion. The interaction effect for the rank indicator by branches is not statistically significant.

In column (4) we test whether the number of third country banks can intensify trade between o and d. Results here suggest that the number of third country banks does not matter since the interaction term with the third country bank indicator is small and insignificant. The main effect remains at 0.53 (p-value = 0.002) which is near the value of 0.49 in column (1).

6 Robustness Checks

In this section, we explore the robustness of our baseline findings in Table 5 as well as a number of other potential specification issues.

6.1 Sample and Data Issues

Trade data are notoriously volatile, even at the annual level. However, in our data set, this issue is unlikely to be influencing our baseline estimates. In Table A3 we average our trade data within the following periods: 1850-1855, 1856-1860, ..., 1906-1910 and a final period of 1910-1913. The indicator for bank presence by country o in d equals one when a bank was present during all years in the period. The number of branches and banks are the within period averages. Point estimates on the banking variables are virtually identical in terms of magnitude and statistical significance to those of the full sample in Table 5.

Our baseline results are also not driven by changes over time in the country composition of the sample. While trade data becomes more abundant after 1870, the selection process driving sample inclusion does not seem to have a large impact on our measurement of the point estimates of bank connections.

Table A4 uses data for a balanced panel of country pairs between 1880 and 1913. The sample is reduced in size by about 50% from 63,204 in Table 5 to 33,144. Results in Table A4 are again qualitatively and quantitatively very similar to those in our baseline results.

6.2 Alternative Parametric Models

Our baseline results are also not being driven by the choice of functional form for the gravity model. Many practitioners in empirical trade advocate for the Poisson model following the results in Silva and Tenreyro (2006). We estimate a Poisson model in Table A5 and find results are very similar to those in our baseline. The elasticity of trade with respect to a bank connection from o to d is somewhat smaller at 0.51 (p-value = 0.000) while the number of banks from o in d is 0.05 instead of 0.18 and it is no longer significant (p-value = 0.14). Similarly, point estimates for the indicator for bank presence by country d in o are comparably smaller than in the baseline declining from 0.57 to 0.38.

We note that in our sample, we have included only a small number of country pairs with zero trade. More work must be done on the historical trade data to ascertain whether missing trade data are true zeros, small amounts or simply unavailable due to the lack of precise statistics.[9]

6.3 Alternative Event Studies

Our baseline event study model from equation (3) and Figure 8 includes country pairs that always had a bank connection since the pair entered the sample. It also includes country pairs that have multiple "spells" due to entry, exit and then subsequent entry by the same or another bank from the same country. Figure A1 re-runs the event study using only the first connection within a pair for the event and removing pairs that have more than one spell as well as those that have had a connection since the start of the data set in 1850. Results show that in the immediate years after entry trade is higher, but the point estimate only about half of that in Figure 8. Point estimates decline to near zero and are not statistically significant at horizons of two to five years. Beyond this, pairs that have had a bank connection for six years or longer have trade that is higher by a statistically significant 0.46 log points (p-value = 0.001). These results suggest that country pairs that have a longer history of connection via international banks tend to have the biggest association between foreign banks and trade.

In Table A2 we implement the "imputation estimator" of Borusyak, Jaravel and Spiess (2020). Borusyak, Jaravel and Spiess (2020) argue that the event study in equation (3) may be biased when there is heterogeneity in the treatment effects. The estimator proceeds in three steps. First, estimate the fixed effects γ_{od}, γ_{ot}, and γ_{dt} using only the as yet un-treated (i.e., no bank connection up to year t) and the never-treated sample. Then the treatment effects for each treated observation in period t are estimated as $\hat{\beta}_{odt} = \ln(\text{EX}_{odt} \cdot \text{EX}_{dot}) -$

[9] We also tried transforming our dependent variable by with the inverse hyperbolic sin transform. Results in Table A6 are qualitatively and quantitatively similar to those in the baseline.

$\hat{\gamma}_{od} - \hat{\gamma}_{ot} - \hat{\gamma}_{dt}$. Borusyak, Jaravel and Spiess (2020) argue that the average of these treatment effects across treated pairs will give a consistent estimate of the treatment effect under a set of reasonable assumptions. The average for h years after time T when a banking connection is first made is calculated as

$$\hat{\beta}_h = \frac{1}{I_h} \sum_{od \in I_h} \hat{\beta}_{od,T_{od}+h} \tag{6}$$

where I_h is the number of country pairs od observed to have a bank connection in year $T_{od}+h$. For each horizon, a difference-in-differences estimator is obtained by comparing trade after a bank connection is made to the level of trade prior the connection and then relative to other pairs that have not yet made a banking connection by time $T_{od} + h$. We focus on the initial year of bank arrival up to ten years after arrival ($h = 0, ..., 10$).

For the pre-period we run a separate fixed effects regression

$$\ln(\text{EX}_{odt} \cdot \text{EX}_{dot}) = \sum_{p=-6}^{-1} \beta_t \times \mathbb{I}(Bank_{odT+p/doT+p}) + \gamma_{od} + \gamma_{ot} + \gamma_{dt} + \varepsilon_{odt} \tag{7}$$

Our results in Figure A2 show a positive and significant post-connection association between bank presence and the log of total trade in the pair. Point estimates rise from 0.23 (p-value = 0.083) to 0.68 (p-value = 0.00) after ten years. Point estimates prior to the arrival of a bank connection in the pair are not statistically significant. Overall, these results are consistent with our baseline findings and our more traditional event study.

7 Conclusion

One of the most significant institutional advances in the first age of globalization was the rise of international financial markets across the world, allowing capital to more easily travel to where it would be most productive. Capital movements within the international financial system directly funded globalization's infrastructure (roads, telegraphs) and commercial transactions, but it also indirectly facilitated the flows of information and contractual enforcement that were necessary for international trade. We study one of the clearest manifestations of the internationalization of finance during this period—international banks—and show that these institutions had a large impact on the direction and volume of international trade.

Our contributions in this paper are twofold: first, providing new facts on the patterns of international banking between all countries, thereby moving beyond studies with only one

or a handful of major countries and incorporating the peripheral countries; and second, by providing causal evidence that finance positively impacted trade patterns. By doing so, we contribute another piece to the puzzle of how finance and trade interacted during a period of major expansion for both.

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Tables

Table 1: Largest banks by country presence, 1870

Bank	Nationality	Countries	Branches
HONG KONG SHANGHAI BANK	Hong Kong	10	16
ORIENTAL BANK CO	United Kingdom	9	32
COLONIAL BANK	United Kingdom	9	17
CHARTERED MERCANTILE BANK OF INDIA LONDON & CHINA	United Kingdom	7	18
CHARTERED BANK OF INDIA AUSTRALIA CHINA	United Kingdom	5	8
MAUA CO	United Kingdom	3	8
LONDON BRAZILIAN BANK	United Kingdom	3	8
AGRA & UNITED SERVICE BANK	United Kingdom	3	8
BANCO DE LONDRES Y MEXICO	United Kingdom	3	5
BANK OF MONTREAL	Canada	3	3

Notes: Table 1 lists the ten largest international banks in our data set. Banks are ranked by the number of countries or colonies in which they had a presence in 1870. Eight banks were tied for the 10th position. These are ordered by number of global branches.

Table 2: Largest banks by country presence, 1910

Bank	Nationality	Countries	Branches
THOMAS COOK & SON	United Kingdom	18	57
HONG KONG SHANGHAI BANK	Hong Kong	13	28
CHARTERED BANK OF INDIA AUSTRALIA CHINA	United Kingdom	12	29
BANK OF BRITISH WEST AFRICA	United Kingdom	10	36
BANQUE DE L'INDO CHINE	France	10	18
INTERNATIONAL BANK CORP	USA	9	14
NEDERLANDSCHE HANDEL MAATSCHAPPIJ	Netherlands	7	23
DEUTSCHE UEBERSEEISCHE BANK	Germany	7	23
COLONIAL BANK	United Kingdom	7	23
CREDIT LYONNAIS	France	7	22

Notes: Table 2 lists the ten largest international banks in our data set. Banks are ranked by the number of countries or colonies in which they had a presence in 1910. Nine banks were tied for the 10th position. These are ordered by number of global branches.

Table 3: Top destination countries for foreign banks, 1870

Destination	Foreign_Banks	Branches
Australia	8	68
India - British Possessions	7	27
China	6	17
USA	5	7
Canada	4	17
Egypt	4	6
Portugal	4	6
Straits Settlements	4	5
Argentina	4	5
New Zealand	3	27

Notes: Table 3 shows the countries/colonies with the largest number of foreign banks in 1870. Data exclude the United Kingdom as a destination. See text for explanations.

Table 4: Top destination countries for foreign banks, 1910

Destination	Foreign_Banks	Branches
France	30	36
USA	22	39
India - British Possessions	16	42
Germany	16	25
Egypt	14	46
China	12	58
Turkey	12	29
Spain	11	18
Straits Settlements	10	18
Australia	9	310

Notes: Table 4 shows the countries/colonies with the largest number of foreign banks in 1910. Data exclude the United Kingdom as a destination. See text for explanations.

Table 5: Gravity relationship between trade and banks

	(1)	(2)	(3)	(4)	(5)	(6)
I(Country$_o$ bank in $_d$)	0.72***					
	[0.18]					
Country$_o$ banks in country$_d$		0.18***				
		[0.05]				
Country$_o$ branches in country$_d$			0.01***			
			[0.00]			
I(Country$_d$ bank in $_o$)				0.57***		
				[0.15]		
Country$_d$ banks in country$_o$					0.13**	
					[0.05]	
Country$_d$ branches in country$_o$						0.01***
						[0.00]
common language	0.49***	0.49***	0.49***	0.46**	0.46**	0.46**
	[0.18]	[0.18]	[0.18]	[0.18]	[0.19]	[0.19]
shared border	0.53**	0.57**	0.62**	0.51**	0.55**	0.58**
	[0.24]	[0.25]	[0.25]	[0.25]	[0.24]	[0.24]
colonial tie	1.38***	1.41***	1.44***	1.47***	1.50***	1.49***
	[0.27]	[0.27]	[0.27]	[0.25]	[0.25]	[0.26]
Country$_{ot}$ FE	Y	Y	Y	Y	Y	Y
Country$_{dt}$ FE	Y	Y	Y	Y	Y	Y
Distance$_{od}$× t FE	Y	Y	Y	Y	Y	Y
N	63204	63204	63204	62548	62548	62548
Exporting countries	116	116	116	118	118	118
Importing countries	120	120	120	117	117	117
Adj. R^2	0.55	0.55	0.55	0.55	0.55	0.55

Notes: Table 5 reports the correlation between different measures of banking and exports. The dependent variable is the log of exports from country o to country d in year t. Standard errors in brackets are 3-way clustered by country of origin, country of destination, and country-pair. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

Table 6: Impact of Banks by Origin Country

	(1)	(2)	(3)	(4)
UK banks in country_d	0.14***		0.11**	
	[0.05]		[0.05]	
French banks in country_d	0.07		-0.08	
	[0.06]		[0.08]	
German banks in country_d	0.13***		0.07	
	[0.04]		[0.07]	
US banks in country_d	0.33*		-0.32	
	[0.19]		[0.26]	
Country_o banks in country_d ex. UK, FRA, DEU, and USA	0.39**		0.29*	
	[0.15]		[0.16]	
UK branches in country_d		0.01***	0.01***	
		[0.00]	[0.00]	
French branches in country_d		0.04***	0.05***	
		[0.01]	[0.01]	
German branches in country_d		0.05***	0.04*	
		[0.01]	[0.02]	
US branches in country_d		0.25***	0.45***	
		[0.06]	[0.10]	
Country_o branches in country_d ex. UK, FRA, DEU, and USA		0.06***	0.03***	
		[0.02]	[0.01]	
I(UK bank in $_d$)				0.89***
				[0.15]
I(French bank in $_d$)				0.26**
				[0.12]
I(German bank in $_d$)				0.45***
				[0.16]
I(American bank in $_d$)				0.57***
				[0.16]
I(Country_o bank in $_d$) ex. UK, FRA, DEU, and USA				0.81***
				[0.25]
common language	0.50***	0.49***	0.49***	0.49***
	[0.16]	[0.16]	[0.16]	[0.16]
shared border	0.54**	0.61***	0.56**	0.53**
	[0.23]	[0.22]	[0.23]	[0.22]
colonial tie	1.41***	1.42***	1.39***	1.37***
	[0.23]	[0.23]	[0.23]	[0.23]
Country_{ot} FE	Y	Y	Y	Y
Country_{dt} FE	Y	Y	Y	Y
$\text{Distance}_{od}\times$ t FE	Y	Y	Y	Y
N	63204	63204	63204	63204
Exporting countries	116	116	116	116
Importing countries	120	120	120	120
Adj. R^2	0.55	0.55	0.55	0.55

Notes: Table 6 reports the correlation between presence of a bank from o in d. Interactions between bank presence variables and British, French, German, and American banks are included. A catchall category includes banks from any other country besides these four countries. The dependent variable is the log of exports from country o to country d in year t. Standard errors in brackets are 3-way clustered by country of origin, country of destination, and country pair. All regressions exclude the UK as a destination for banks due to missing data. $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 7: Placebo test: Does any neighbor have a bank in d?

	(1)	(2)	(3)
Any neighbor of $\text{Country}_{\text{o}}$ has a bank in $\text{country}_{\text{d}}$	0.24	0.13	0.16
	[0.15]	[0.11]	[0.11]
I($\text{Country}_{\text{o}}$ bank in $_{\text{d}}$)			0.73***
			[0.18]
common language		0.50***	0.49***
		[0.18]	[0.18]
shared border		0.57**	0.46*
		[0.24]	[0.24]
colonial tie		1.48***	1.38***
		[0.27]	[0.27]
$\text{Country}_{\text{ot}}$ FE	Y	Y	Y
$\text{Country}_{\text{dt}}$ FE	Y	Y	Y
$\text{Distance}_{\text{od}}\times$ t FE	Y	Y	Y
N	63204	63204	63204
Exporting countries	116	116	116
Adj. R^2	0.52	0.55	0.55

Notes: Table 7 reports the correlation between presence of a bank in d from any neighbor of o as well as presence of a bank from o in d. The dependent variable is the log of exports from country$o$ to country d in year t. Standard errors in brackets are 3-way clustered by country of origin, country of destination, and within country pair. All regressions exclude the UK as a destination for banks due to missing data. *$p <$ 0.1, **$p < 0.05$, ***$p < 0.01$

Table 8: Near neighbors as a control group

	(1)	(2)	(3)	(4)	(5)	(6)
I(Country$_o$ bank in $_d$)	0.46***	0.65***				
	[0.11]	[0.16]				
Country$_o$ banks in country$_d$			0.24***	0.32***		
			[0.06]	[0.07]		
Country$_o$ branches in country$_d$					0.02**	0.02***
					[0.01]	[0.01]
Country$_{ot}$ FE	Y	Y	Y	Y	Y	Y
Country$_{dt}$ FE	Y	Y	Y	Y	Y	Y
Distance$_{od}$× t FE	Y	Y	Y	Y	Y	Y
Pair of Border Countries x Destination FE	Y		Y		Y	
Pair of Border Countries x Destination x year FE		Y		Y		Y
N	188768	188768	188768	188768	188768	188768
Exporting countries	81	79	81	79	81	79
Adj. R^2	0.80	0.60	0.80	0.60	0.80	0.60

Notes: Table 8 reports the correlation between presence of a bank from o in country d. The control group for each country o is the set of near neighbors that export to d as well. Near neighbors are defined as countries that share a border with o or are within 425 km in terms of geodesic distance. The dependent variable is the log of exports from country o to country d in year t. Standard errors in brackets are 3-way clustered by country of origin, country of destination, and within the triple of a pair of countries that are neighbors and the destination market. All regressions exclude the UK as a destination for banks due to missing data. $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 9: Interaction Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
I(Country$_o$ bank in $_d$)	0.57**	-4.00***	0.78**	0.51	0.55**	0.35*	0.73**	0.37*	0.46*	0.92***	1.19***	
	[0.23]	[1.20]	[0.33]	[0.37]	[0.22]	[0.19]	[0.27]	[0.20]	[0.25]	[0.30]	[0.41]	
× distance$_{od}$		0.57***										
		[0.15]										
×(GDP per capita)$_d$			-0.0074									
			[0.01]									
×(GDP per capita)$_o$				0.0020								
				[0.01]								
× colonial tie					0.27							
					[0.41]							
× (dom. branches per capita)$_d$						0.0070***						
						[0.00]						
× (dom. banks per capita)$_d$							-0.046					
							[0.04]					
× I(Major bank by branches)								0.45*				
								[0.25]				
× I(Major bank by num. of countries)									0.16			
									[0.24]			
× Num. of banks from other countries										-0.0044*		
										[0.00]		
× Num. other countries w/ banks in d											-0.12**	
											[0.05]	
×(Africa)$_d$												1.10***
												[0.18]
×(Americas)$_d$												0.64**
												[0.31]
×(Asia)$_d$												1.14***
												[0.37]
×(Europe)$_d$												-0.13
												[0.22]
×(Oceania)$_d$												2.94***
												[0.54]
Country$_{ot}$ FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Country$_{dt}$ FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Distance$_{od}$× t FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	23500	23500	23500	23500	23500	23500	23500	23500	23500	23500	23500	23500
Exporting countries	34	34	34	34	34	34	34	34	34	34	34	34
Importing countries	33	33	33	33	33	33	33	33	33	33	33	33
Adj. R^2	0.60	0.61	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.61

Notes: Table 9 reports the correlation between presence of a bank from o in country d. The dependent variable is the log of exports from country$o$ to country$d$ in year t. Standard errors in brackets are 3-way clustered by country of origin, country of destination, and country pair. All regressions exclude the UK as a destination for banks due to missing data. All models include controls for common language, colonial relations and shared border. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

Table 10: Trade Diversion and Complementarities

	(1)	(2)	(3)	(4)
I(Country$_o$ bank in d)	0.74***	0.83***		
	[0.19]	[0.21]		
I(UK in d) × I(Country$_o$ = DEU or FRA)	0.13	0.22		
	[0.16]	[0.22]		
I(Germany in d) × I(Country$_o$ = UK or FRA)	-0.27	0.29		
	[0.26]	[0.39]		
I(France in d) × I(Country$_o$ = DEU or UK)	-0.29*	-0.28		
	[0.17]	[0.19]		
I(UK in d) × I(DEU or FRA in d) × I(Country$_o$ = DEU or FRA)		-0.37		
		[0.23]		
I(Germany in d) × I(UK or FRA in d) × I(Country$_o$ = UK or FRA)		-0.71***		
		[0.24]		
I(France in d) × I(DEU or UK in d) × I(Country$_o$ = DEU or UK)		0.01		
		[0.14]		
Country$_o$ banks in d			0.24***	0.26***
			[0.06]	[0.06]
No. UK banks in d and I(Country$_o$ = DEU or FRA)			0.07**	0.10*
			[0.03]	[0.05]
No. German banks in d and I(Country$_o$ = UK or FRA)			-0.01***	-0.01***
			[0.00]	[0.00]
No. French banks in d and I(Country$_o$ = DEU or UK)			-0.02***	-0.02***
			[0.00]	[0.00]
No. UK banks in d × No. DEU or FRA banks × I(Country$_o$ = DEU or FRA)				-0.03
				[0.03]
No. German banks in d × No. UK or FRA banks × I(Country$_o$ = UK or FRA)				0.00
				[0.00]
No. French banks in d × No. DEU or UK banks × I(Country$_o$ = DEU or UK)				-0.00***
				[0.00]
common language	0.49***	0.49***	0.49***	0.49***
	[0.18]	[0.18]	[0.18]	[0.18]
shared border	0.51**	0.51**	0.57**	0.57**
	[0.24]	[0.24]	[0.23]	[0.24]
colonial tie	1.37***	1.36***	1.38***	1.37***
	[0.27]	[0.27]	[0.28]	[0.28]
Country$_{ot}$ FE	Y	Y	Y	Y
Country$_{dt}$ FE	Y	Y	Y	Y
Distance$_{od}$× t FE	Y	Y	Y	Y
N	63204	63204	63204	63204
Exporting countries	116	116	116	116
Importing countries	120	120	120	120
Adj. R^2	0.55	0.55	0.55	0.55

Notes: Table 10 reports the correlation between presence of a bank from o in country d. The dependent variable is the log of exports from country o to country d in year t. Standard errors in brackets are 3-way clustered by country of origin, country of destination, and country pair. All regressions exclude the UK as a destination for banks due to missing data. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

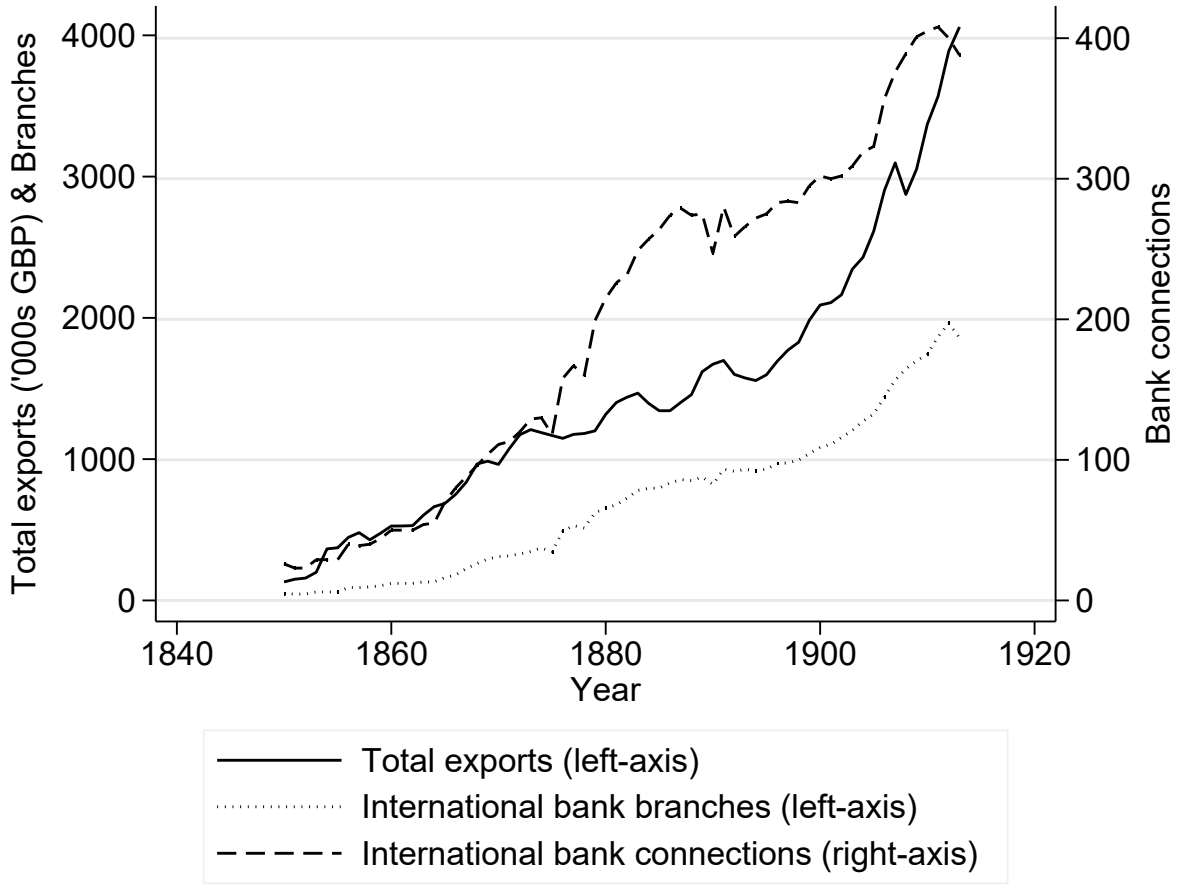
Table 11: Third Country Connections and Trade

	(1)	(2)	(3)	(4)
Third country bank in o and d	0.50***	0.53***	0.48***	0.53***
	[0.11]	[0.12]	[0.12]	[0.17]
Third country bank in o and d × Major bank by no. of ctrs.		-0.41*		
		[0.21]		
Third country bank in o and d × Major bank by no. global branches			0.18	
			[0.23]	
Third country bank in o and d × no. of third country banks				-0.02
				[0.09]
I(Country$_o$ bank in $_d$)	0.73***	0.86***	0.69***	0.74***
	[0.19]	[0.17]	[0.21]	[0.19]
common language	0.46**	0.45**	0.46**	0.46**
	[0.18]	[0.18]	[0.18]	[0.18]
shared border	0.50**	0.51**	0.51**	0.51**
	[0.24]	[0.24]	[0.24]	[0.24]
colonial tie	1.38***	1.37***	1.38***	1.38***
	[0.27]	[0.27]	[0.27]	[0.27]
Country$_{ot}$ FE	Y	Y	Y	Y
Country$_{dt}$ FE	Y	Y	Y	Y
Distance$_{od}$× t FE	Y	Y	Y	Y
N	63204	63204	63204	63204
Exporting countries	116	116	116	116
Importing countries	120	120	120	120
Adj. R^2	0.56	0.56	0.56	0.56

Notes: Table 11 reports the correlation between presence of a bank from a third country in o and d. Various measures are used to show these connections. The dependent variable is the log of exports from country o to country d in year t. Standard errors in brackets are 3-way clustered by country of origin, country of destination, and country pair. All regressions exclude the UK as a destination for banks due to missing data. $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

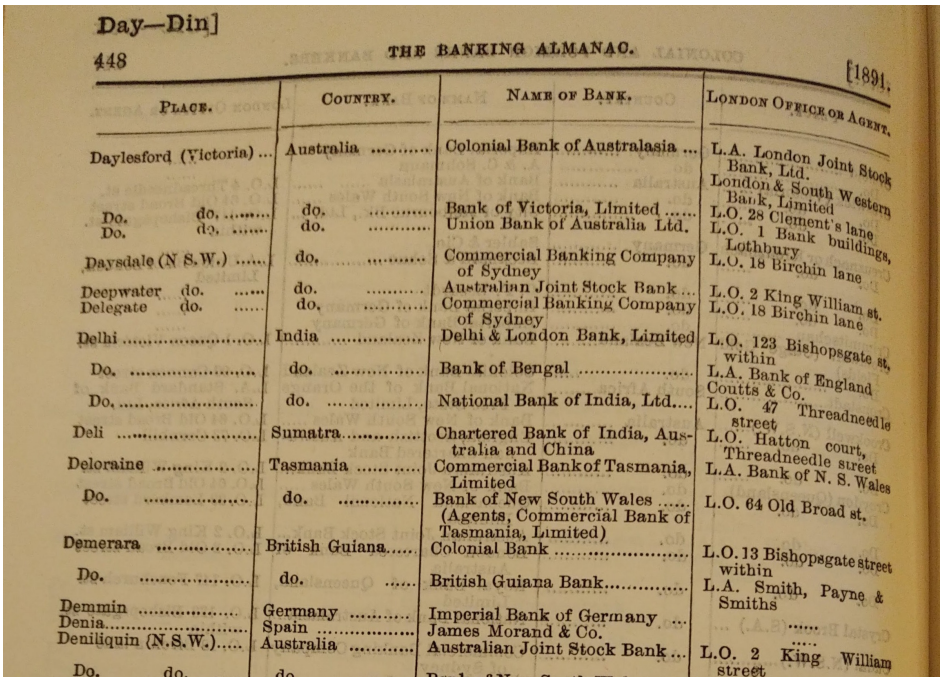
Figures

Figure 1: Growth in trade and international bank connections



Notes: Figure 1 plots the growth in the total number of foreign bank connections and foreign branches, along with world exports from 1850–1914. Banks may operate in multiple countries so that the number of foreign bank connections in a year is greater than or equal to the number of banks with presence in a foreign country.

Figure 2: Example of *Bankers' Almanac and Directory*



Day—Din]

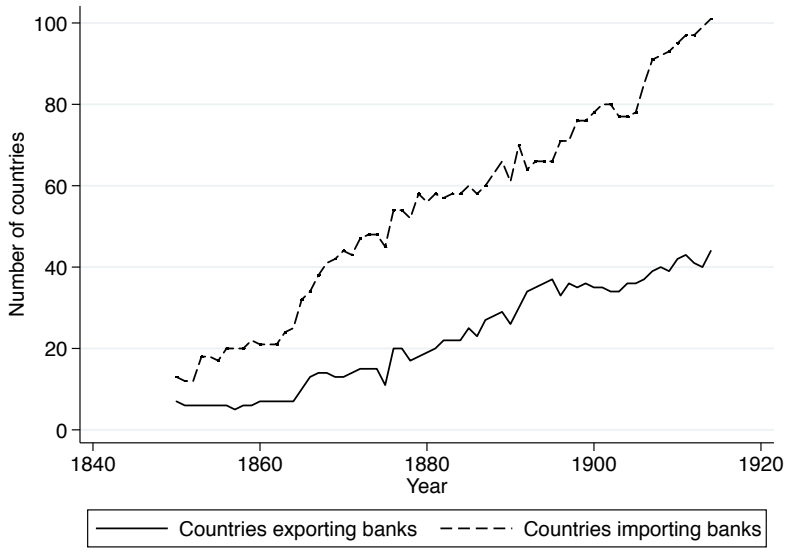
448 THE BANKING ALMANAC. [1891.

Place.	Country.	Name of Bank.	London Office or Agent.
Daylesford (Victoria) ...	Australia	Colonial Bank of Australasia ...	L.A. London Joint Stock Bank, Ltd.
Do. do.	do.	Bank of Victoria, Limited	London & South Western Bank, Limited
Do. do.	do.	Union Bank of Australia Ltd.	L.O. 28 Clement's lane
Daysdale (N S.W.)	do.	Commercial Banking Company of Sydney	L.O. 1 Bank buildings, Lothbury
Deepwater do.	do.	Australian Joint Stock Bank ...	L.O. 18 Birchin lane
Delegate do.	do.	Commercial Banking Company of Sydney	L.O. 2 King William st.
Delhi	India	Delhi & London Bank, Limited	L.O. 18 Birchin lane
Do.	do.	Bank of Bengal	L.O. 123 Bishopsgate st. within
Do.	do.	National Bank of India, Ltd....	L.A. Bank of England
Deli	Sumatra	Chartered Bank of India, Australia and China	Coutts & Co.
Deloraine	Tasmania	Commercial Bank of Tasmania, Limited	L.O. 47 Threadneedle street
Do.	do.	Bank of New South Wales ..... (Agents, Commercial Bank of Tasmania, Limited)	L.O. Hatton court, Threadneedle street
Demerara	British Guiana	Colonial Bank	L.A. Bank of N. S. Wales
Do.	do.	British Guiana Bank.....	L.O. 64 Old Broad st.
Demmin	Germany	Imperial Bank of Germany ...	L.O. 13 Bishopsgate street within
Denia.....	Spain	James Morand & Co.	L.A. Smith, Payne & Smiths
Deniliquin (N.S.W.).....	Australia	Australian Joint Stock Bank ...	.....
Do. do.	do.		L.O. 2 King William street

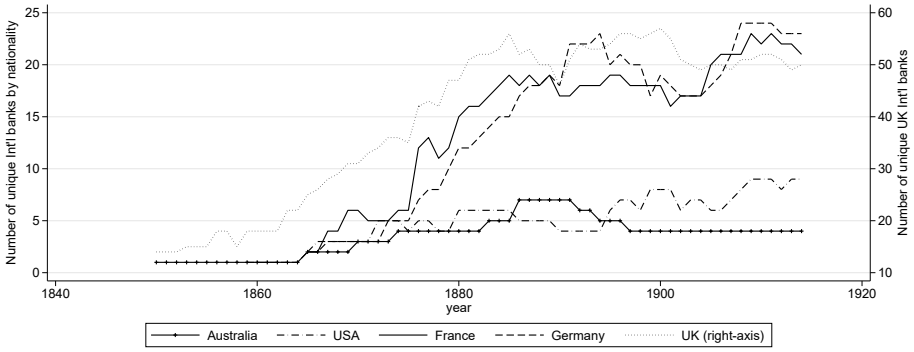
Notes: Figure 2 shows an example of the *Bankers' Almanac and Directory* from 1891. The first column lists the city, the second column lists the country, the third column lists the name of the bank in question, and the final column lists the form of the bank's presence in London.

Figure 3: Multinational bank expansion

(a) Number of countries importing and exporting banks

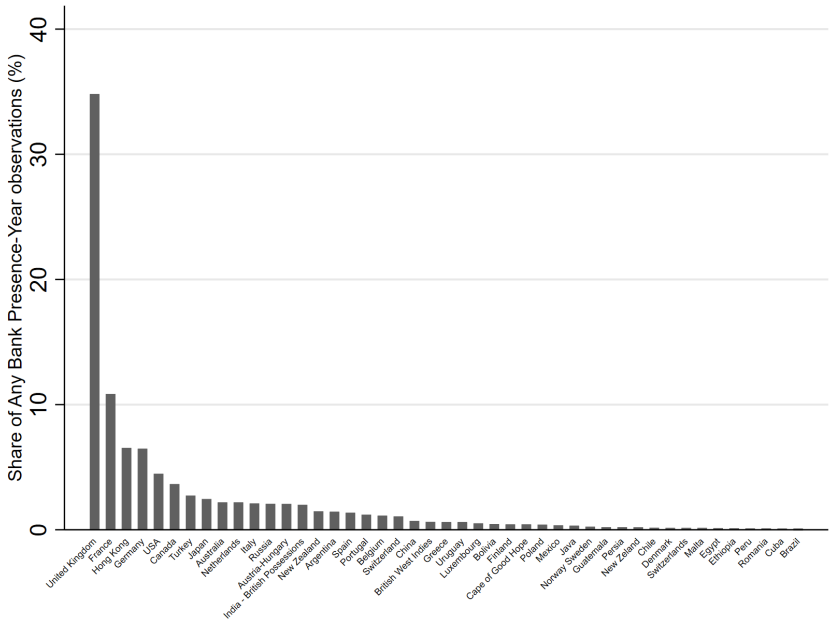


(b) Top countries exporting banks



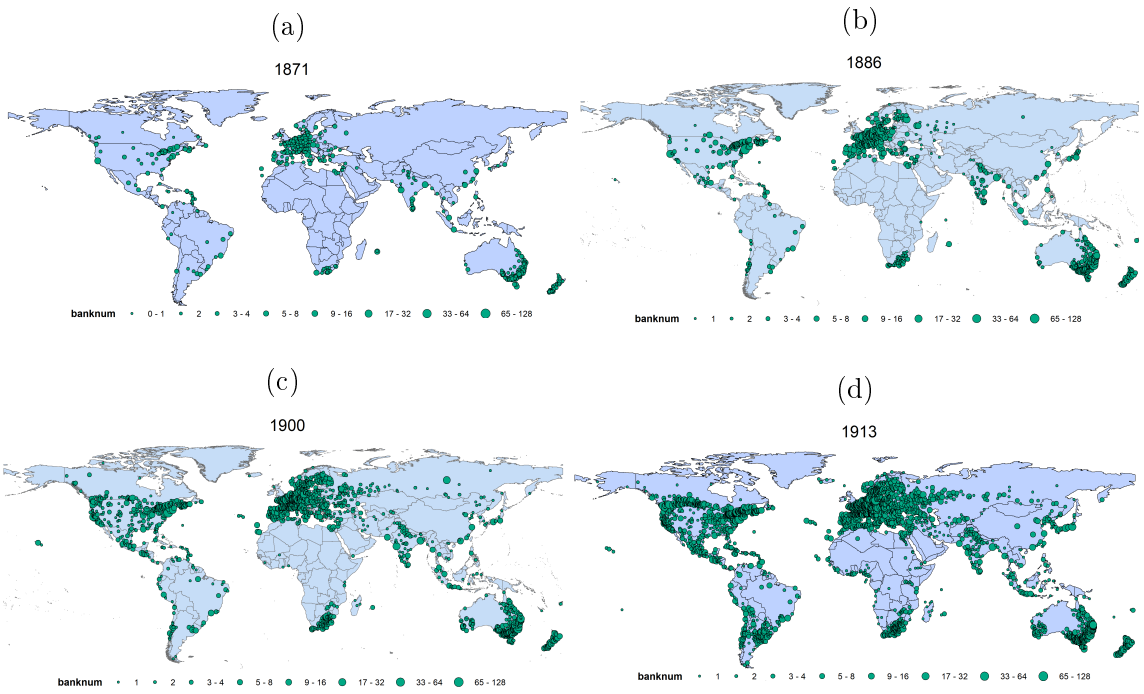
Notes: Figure 3a plots the total number of countries with banks operating outside their own country, by year and the number of countries with non-domestic banks operating within their own country, by year. Figure 3b plots the number of unique banks of each nationality that operated outside of the home country.

Figure 4: Distribution of banks abroad by nationality



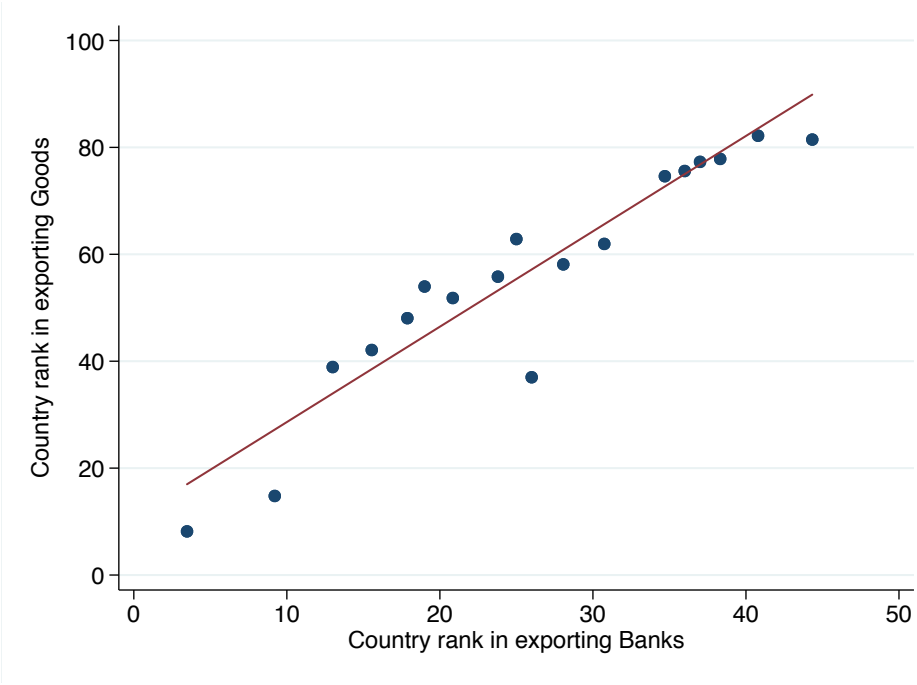
Notes: Figure 4 plots the distribution of the banks operating outside of their home country, pooling the data for the entire period.

Figure 5: Maps of banking sector expansion



Notes: Figure 5a maps the locations and number of banks at the city-level around the world in 1871. Data come from the digitized *Bankers' Almanac and Directory*. Figures 5b, 5c, and 5d map the equivalent for 1886, 1900, and 1913, respectively.

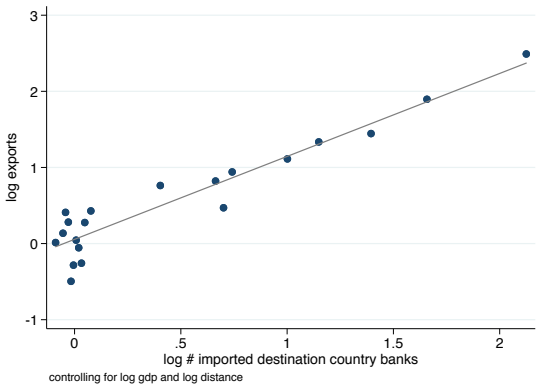
Figure 6: Correlation between exports in goods and banks: country rankings



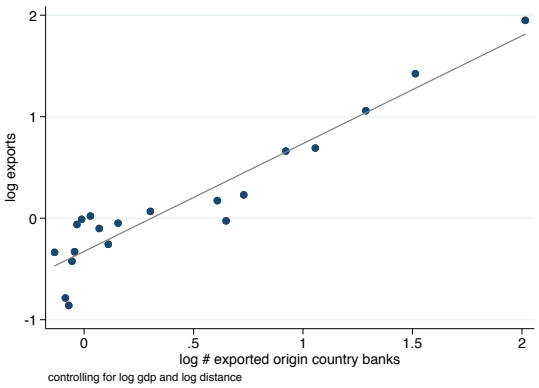
Notes: Figure 6 is a binscatter that plots the relationship between a country's annual rank in total exports in goods (y-axis) and total exports in number of banks (x-axis). The underlying data are country-year combinations.

Figure 7: Correlation between exports in goods and banks: volumes

(a) Bank imports

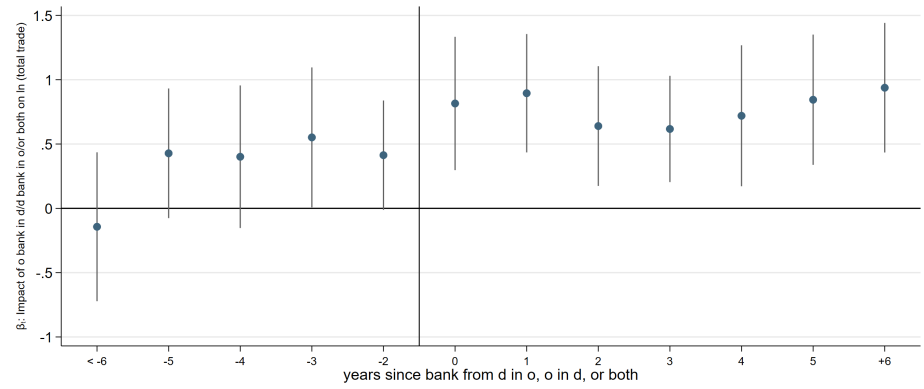


(b) Bank exports



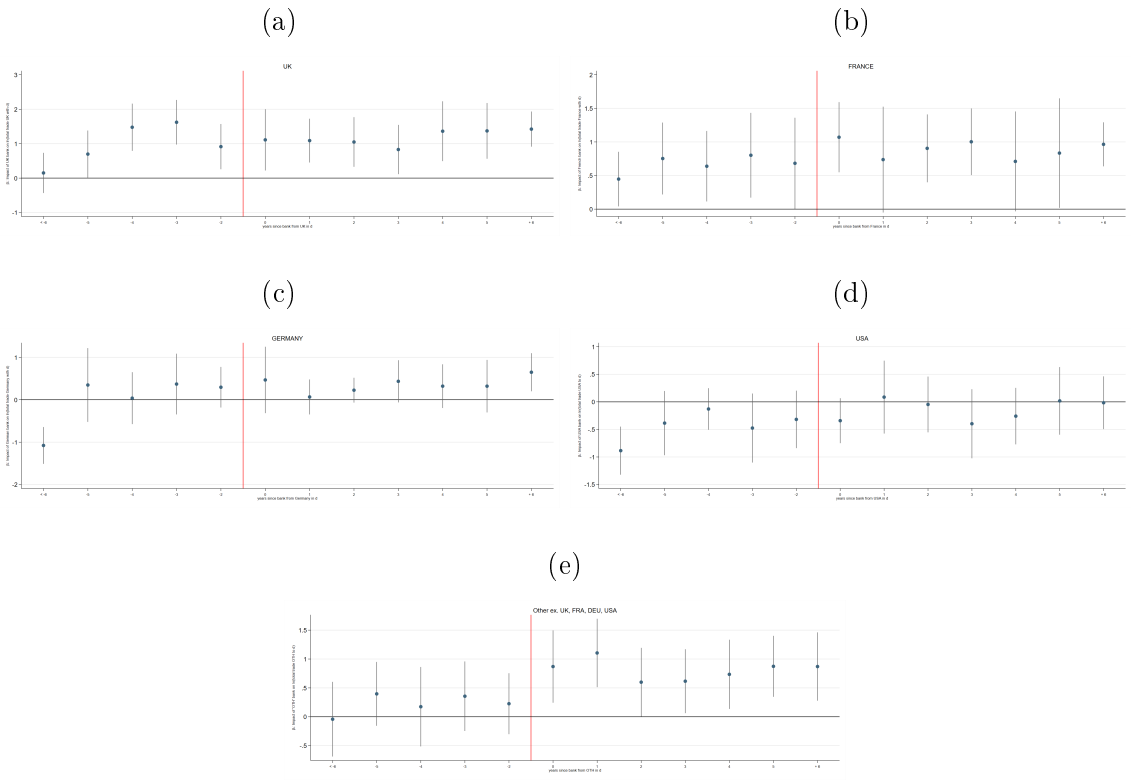
Notes: Figure 7a is a binscatter plotting the log of the number of the exporter's destination country's bank in the exporting country. Figure 7b plots the reverse. Both figures are residualized on the log of GDP and the bilateral distance between countries.

Figure 8: Event Study of Impact of Banks from d in o, o in d, or both



Notes: Figure 8 plots the relationship between total trade in a pair versus an indicator for whether a bank from the destination is in the origin, a bank from the origin is in the destination or both. Standard errors are clustered at the pair, destination and origin level.

Figure 9: Event Study of Banking Relationships and Trade: by country of origin



Notes: Figure 9 shows event studies for four countries and a final group for the relationship between total trade in the pair and whether a bank from one of the four countries is present in the trade partner or similarly for "other" countries as described in the text. Standard errors are clustered at the country pair and the o and d level.

Appendix for Online Publication

International Banks: Re-Agents of Globalization?

Table of Contents

A Additional Tables and Figures

A.1 Additional Tables

A.2 Additional Figures

Table A1: Chi-squared test for similarity of regional locations for eight major sending countries, 1910

	Region					
Country	Africa	Americas	Asia	Europe	Oceania	Total
Australia	0	0	0	2	2	4
Canada	0	19	0	1	0	20
France	17	3	10	12	3	45
Germany	5	15	8	11	0	39
Hong Kong	0	1	9	2	0	12
Japan	0	1	5	1	0	7
USA	0	3	7	8	0	18
United Kingdom	27	41	30	28	8	134
Total	49	83	69	65	13	279
Pearson chi2(28) =	123.0453	Pr =	0.000			

Notes: Table A1 reports the χ^2 test for the null hypothesis that the regional distribution of banks for eight sending countries is independent of the identitiy of the sending country.

Table A2: Chi-squared test for similarity of regional locations for three major sending countries, 1910

	Region					
Country	Africa	Americas	Asia	Europe	Oceania	Total
France	17	3	10	12	3	45
Germany	5	15	8	11	0	39
United Kingdom	27	41	30	28	8	134
Total	49	59	48	51	11	218
Pearson chi2(8) =	19.4635	Pr =	0.013			

Notes: Table A2 reports the χ^2 test for the null hypothesis that the regional distribution of banks for three major sending countries is independent of the identitiy of the sending country.

Table A3: Gravity relationship between trade and banks: five-year averages

	(1)	(2)	(3)	(4)	(5)	(6)
I(Country$_o$ bank in $_d$)	0.72***					
	[0.18]					
Country$_o$ banks in country$_d$		0.18***				
		[0.06]				
Country$_o$ branches in country$_d$			0.01***			
			[0.00]			
I(Country$_d$ bank in $_o$)				0.57***		
				[0.16]		
Country$_d$ banks in country$_o$					0.13**	
					[0.05]	
Country$_d$ branches in country$_o$						0.01***
						[0.00]
common language	0.52***	0.53***	0.53***	0.49***	0.50***	0.50***
	[0.16]	[0.16]	[0.16]	[0.16]	[0.17]	[0.17]
shared border	0.51**	0.55**	0.59***	0.50**	0.53**	0.55***
	[0.21]	[0.22]	[0.21]	[0.21]	[0.21]	[0.21]
colonial tie	1.52***	1.54***	1.57***	1.61***	1.63***	1.63***
	[0.26]	[0.25]	[0.25]	[0.24]	[0.23]	[0.24]
Country$_{ot}$ FE	Y	Y	Y	Y	Y	Y
Country$_{dt}$ FE	Y	Y	Y	Y	Y	Y
Distance$_{od}$× t FE	Y	Y	Y	Y	Y	Y
N	15225	15225	15225	15128	15128	15128
Exporting countries	117	117	117	118	118	118
Importing countries	120	120	120	118	118	118
Adj. R^2	0.58	0.58	0.58	0.58	0.58	0.58

Notes: Table A3 reports the correlation between different measures of banking and exports. All data are averaged within five year periods beginning in 1850. The last period begins in 1910 and ends in 1913. The dependent variable is the log of (average) exports from country$_o$ to country$_d$ in year t. Standard errors in brackets are 3-way clustered by country of origin, country of destination, and country-pair. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

Table A4: Gravity relationship between trade and banks: balanced panel, 1880-1914

	(1)	(2)	(3)	(4)	(5)	(6)
I(Country$_o$ bank in $_d$)	0.66***					
	[0.13]					
Country$_o$ banks in country$_d$		0.21***				
		[0.01]				
Country$_o$ branches in country$_d$			0.01***			
			[0.00]			
I(Country$_d$ bank in $_o$)				0.56***		
				[0.10]		
Country$_d$ banks in country$_o$					0.15***	
					[0.03]	
Country$_d$ branches in country$_o$						0.01***
						[0.00]
common language	0.45**	0.42**	0.42**	0.40**	0.38*	0.38*
	[0.20]	[0.20]	[0.20]	[0.20]	[0.20]	[0.20]
shared border	0.50**	0.51**	0.58**	0.51**	0.53**	0.57**
	[0.24]	[0.23]	[0.24]	[0.24]	[0.24]	[0.24]
colonial tie	0.87***	0.87***	0.92***	0.91***	0.94***	0.94***
	[0.23]	[0.24]	[0.24]	[0.20]	[0.21]	[0.22]
Country$_{ot}$ FE	Y	Y	Y	Y	Y	Y
Country$_{dt}$ FE	Y	Y	Y	Y	Y	Y
Distance$_{od}$× t FE	Y	Y	Y	Y	Y	Y
N	33114	33114	33114	32540	32540	32540
Exporting countries	58	58	58	63	63	63
Importing countries	69	69	69	60	60	60
Adj. R^2	0.57	0.57	0.57	0.58	0.58	0.58

Notes: Table A4 reports the correlation between different measures of banking and exports. The sample is a balanced sample of country pairs between 1880 and 1913. The dependent variable is the log of exports from country o to country d in year t. Standard errors in brackets are 3-way clustered by country of origin, country of destination, and country-pair. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

Table A5: Gravity relationship between trade and banks: Poisson regression

	(1)	(2)	(3)	(4)	(5)	(6)
I(Country$_o$ bank in $_d$)	0.51***					
	[0.10]					
Country$_o$ banks in country$_d$		0.05				
		[0.03]				
Country$_o$ branches in country$_d$			0.01***			
			[0.00]			
I(Country$_d$ bank in $_o$)				0.38***		
				[0.11]		
Country$_d$ banks in country$_o$					0.05**	
					[0.02]	
Country$_d$ branches in country$_o$						0.01**
						[0.00]
common language	0.48***	0.44**	0.44**	0.44***	0.38**	0.40**
	[0.17]	[0.20]	[0.19]	[0.17]	[0.18]	[0.18]
shared border	0.39	0.45*	0.45*	0.26	0.31	0.31
	[0.26]	[0.28]	[0.26]	[0.19]	[0.20]	[0.20]
colonial tie	0.90***	0.95***	0.90***	0.92***	0.94***	0.91***
	[0.19]	[0.18]	[0.21]	[0.16]	[0.17]	[0.18]
Country$_{ot}$ FE	Y	Y	Y	Y	Y	Y
Country$_{dt}$ FE	Y	Y	Y	Y	Y	Y
Distance$_{od}$× t FE	Y	Y	Y	Y	Y	Y
N	63595	63595	63595	62946	62946	62946
Exporting countries	116	116	116	118	118	118
Importing countries	120	120	120	117	117	117

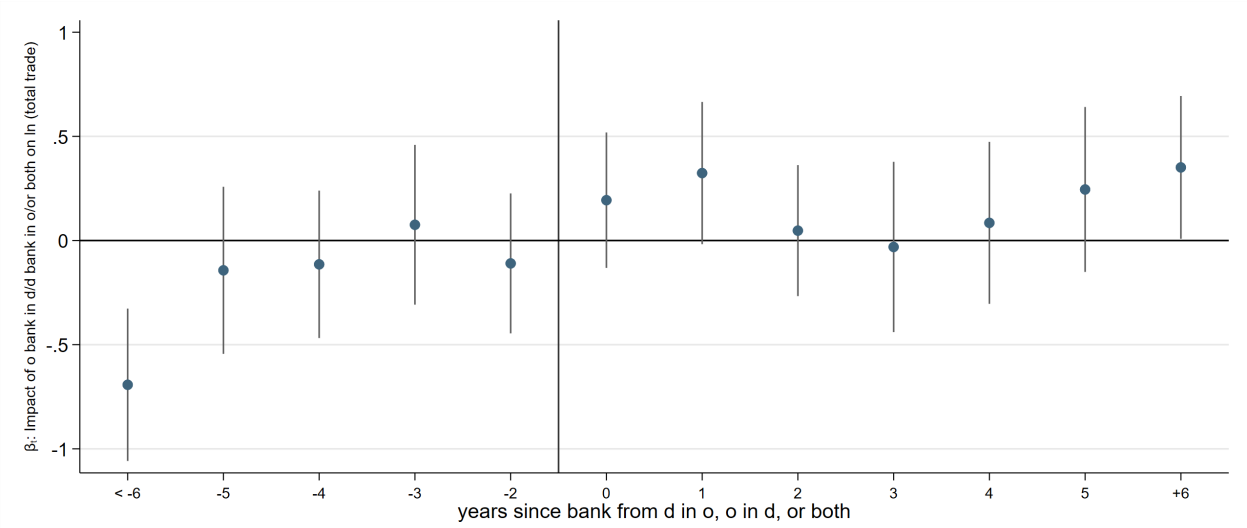
Notes: Table A5 reports the correlation between different measures of banking and exports. The sample is a balanced sample of country pairs between 1880 and 1913. The dependent variable is exports from country o to country d in year t. Estimation is by Poisson regression for large numbers of fixed effects (Correia, ***). Standard errors in brackets are 3-way clustered by country of origin, country of destination, and country-pair. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

Table A6: Gravity relationship between trade and banks: Inv. hyperbolic sin transform

	(1)	(2)	(3)	(4)	(5)	(6)
I(Country$_o$ bank in $_d$)	0.58***					
	[0.06]					
Country$_o$ banks in country$_d$		0.28***				
		[0.02]				
Country$_o$ branches in country$_d$			0.01***			
			[0.00]			
I(Country$_d$ bank in $_o$)				0.54***		
				[0.05]		
Country$_d$ banks in country$_o$					0.29***	
					[0.01]	
Country$_d$ branches in country$_o$						0.01***
						[0.00]
common language	0.14***	0.14**	0.14**	0.13**	0.12**	0.13**
	[0.05]	[0.05]	[0.06]	[0.05]	[0.05]	[0.06]
shared border	0.36***	0.36***	0.43***	0.35***	0.34***	0.41***
	[0.11]	[0.11]	[0.12]	[0.12]	[0.11]	[0.13]
colonial tie	0.26***	0.24***	0.29***	0.29***	0.27***	0.31***
	[0.08]	[0.09]	[0.09]	[0.08]	[0.08]	[0.09]
Country$_{ot}$ FE	Y	Y	Y	Y	Y	Y
Country$_{dt}$ FE	Y	Y	Y	Y	Y	Y
Distance$_{od}$× t FE	Y	Y	Y	Y	Y	Y
N	63595	63595	63595	62946	62946	62946
Exporting countries	116	116	116	118	118	118
Importing countries	120	120	120	117	117	117

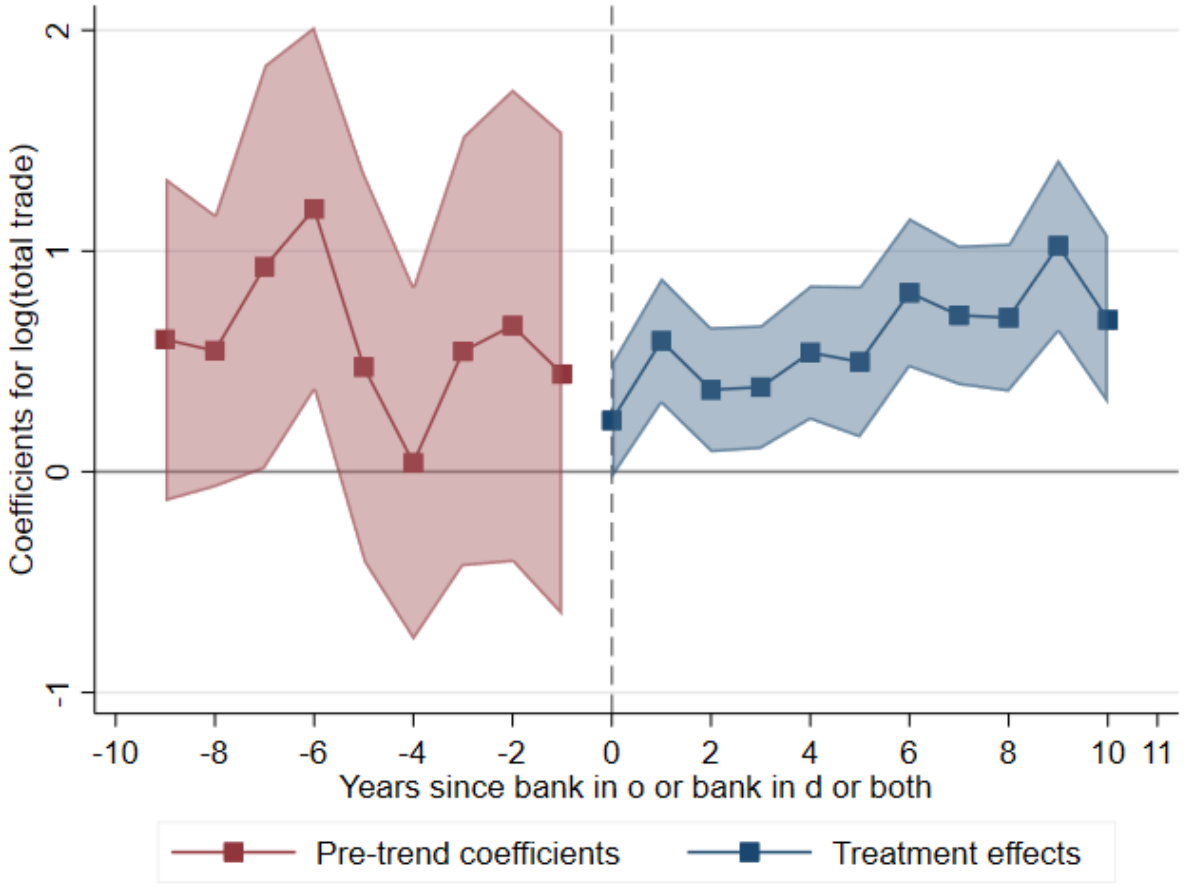
Notes: Table A6 reports the correlation between different measures of banking and exports. The dependent variable is the inverse hyperbolic sin transform of exports from country o to country d in year t. Standard errors in brackets are 3-way clustered by country of origin, country of destination, and country-pair. $^*p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Figure A1: Event Study: Using First Bank Connection As Event



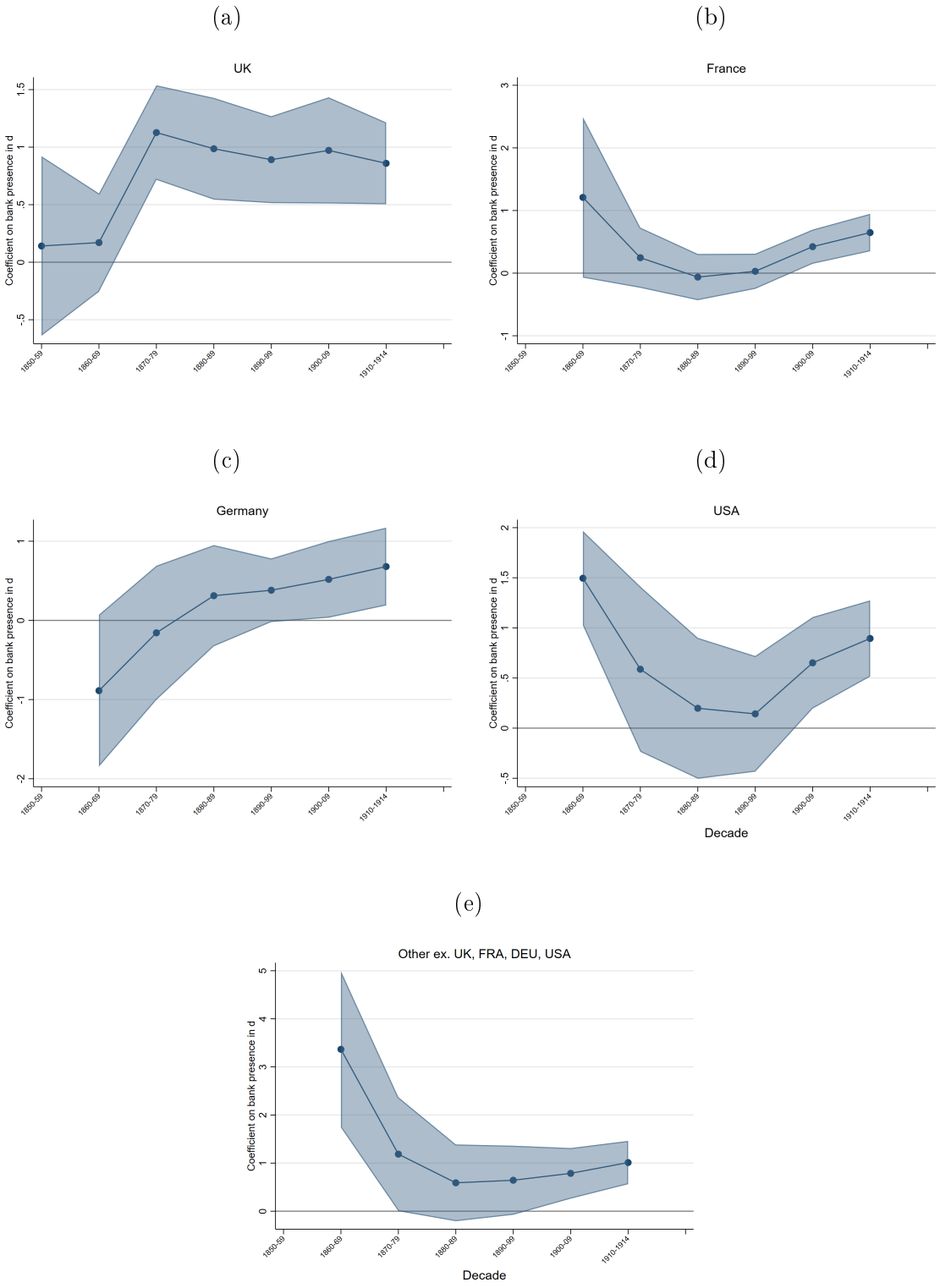
Notes: Figure A1 plots the relationship between total trade in a pair versus an indicator for whether a bank from the destination is in the origin, a bank from the origin is in the destination or both. Coefficient estimates are from the "imputation estimator". The 95% confidence intervals are also plotted. Standard errors are clustered at the country pair level. Years beyond 10 years after a bank connection is established are in the last category and similarly for 10 years prior to the event.

Figure A2: Event Study: Imputation Estimator of Boryusak et. al



Notes: Figure A2 plots the relationship between total trade in a pair versus an indicator for whether a bank from the destination is in the origin, a bank from the origin is in the destination or both. Coefficient estimates are from the "imputation estimator". The 95% confidence intervals are also plotted. Standard errors are clustered at the country pair level.

Figure A3: Coefficient on bank presence by decade country of origin



Notes: Figure A3 shows the relationship between the logarithm of exports from o to d and bank presence by o in d by decade. Standard errors are 3-way clustered by country of origin, country of destination, country-pair.

B Data sources

B.1 Data constructed

Country-level panel of international banking The country-level panel of international bank imports and exports across countries includes over 16,000 non-zero annual observations where an observation is a measure of the number of unique banks or branches imported or exported between countries. Determining the "importer" for each observation is straightforward: it is simply the country that is listed in the original almanac. We use the city information provided to standardize borders to be consistent with the trade dataset.

Determining the nationality of the banks in our dataset was less straightforward and required extensive other primary and secondary sources. The primary source that we used for determining a nationality was the known headquarter location for a bank in either 1913 or 1910 , which were printed in those years' almanacs. The headquarter information was not available for all banks, so we resort to secondary sources such as individual bank histories to determine the location or capital and control.

An example for defining a banks nationality by the location of its headquarters is the French "Banque de Paris et des Pays-Bas" (Paripas). The 1913 version of the Almanac indicates that the bank operates in Amsterdam, Brussels, and Geneva, with its headquarters located in Paris, France (*Banker's Almanac*, 1913, p. 345). Secondary sources on the history of Paribas support this decision.

In contrast, the *Almanac* does not provide any information on the banks headquarters for the "Chartered Mercantile Bank of India." The bank was founded in 1853 in Bombay, India, with Indian and British participation, with the main purpose to finance the trade between Europe, India, and China. In 1858, the bank headquarters moved to London, with the management becoming exclusively British and British investors being main shareholders (Muirhead and Green, 2016). We assigned British nationality to this bank.

Country-level panel of trade in goods

The country-level panel of bilateral trade in goods includes over 62,000 observations for 130 countries from 1870–1914. The sources are Pascali (2017), Dedinger and Girard (2017), Fouquin and Hugot (2016), and Mitchener and Weidenmier (2008), along with the *Statistical Tables* published by the United Kingdom and United States. Measures of bilateral resistance between countries, such as common language, land border, and common colonial background were taken from Fouquin and Hugot (2016).Geodesic distance between countries is based on the center of the standardized pre-WWI country borders. Measures of GDP and

population from Fouquin and Hugot (2016) were also recalculated to reflect those borders.