# Do Universal Banks Create Value? Universal Bank Affiliation and Company Performance in Belgium, 1905-1909*

Wouter Van Overfelt
University of Antwerp
Prinsstraat 13, 2000 Antwerp, Belgium
wouter.vanoverfelt@ua.ac.be
Tel: +32-3-220 42 31
Fax: +32-3-220 40 64

Jan Annaert
University of Antwerp
Prinsstraat 13, 2000 Antwerp, Belgium
jan.annaert@ua.ac.be
Tel: +32-3-220 41 63
Fax: +32-3-220 42 64

Marc De Ceuster
University of Antwerp
Prinsstraat 13, 2000 Antwerp, Belgium
marc.deceuster@ua.ac.be
Tel: +32-3-220 41 24
Fax: +32-3-220 40 64

Marc Deloof
University of Antwerp
Prinsstraat 13, 2000 Antwerp, Belgium
marc.deloof@ua.ac.be
Tel: +32-3-220 41 69
Fax: +32-3-220 40 64

* We are grateful to Frans Buelens, Abe de Jong, Georges Gallais-Hamono, Aldo Musacchio, Randall Morck, Steven Ongena, Jesus Manuel Salas, Bob van den Brand and Hans Willems for helpful comments and suggestions. The paper has also benefited from presentations at the Erasmus University Rotterdam, Ghent University, Tilburg University, the 2005 FMA European Meeting (Siena), the 2005 Affi Annual Meeting (Paris), the 2005 EFMA Meeting (Milan), the 2005 Belgian Financial Research Forum (Antwerp), and the Business Finance and Institutions Conference in Antwerp. Financial Support form the Fonds voor Wetenschappelijk Onderzoek (Grant n° G.0013.02) is gratefully acknowledged. All remaining errors are ours.

# Do Universal Banks Create Value? Universal Bank Affiliation and Company Performance in Belgium, 1905-1909


**Abstract**

Universal banks are financial institutions that offer an entire range of financial services. In this paper we investigate the impact of universal banks on both the performance and the risk of universal bank affiliated companies in Belgium. Belgium is an important country to study for a number of reasons. It was the first country in continental Europe where the industrial revolution took off and economic historians have attributed a central role in the industrialization to universal banks. Second, the weak legal system and the poor investor protection arguably bear resemblance to the current economic situation in many developing countries. In addition, the time was characterized by unprecedented globalization, increasing international competition and extended financial development. Finally, the period was marked by a financial crisis in 1907 that was strikingly similar to some crises experienced in the 1990's.

We define affiliated companies as (i) companies that had director interlocks with one of the six main universal banks at that time in Belgium and (ii) companies in which one of the six main universal banks held an equity stake. We measure the extent of affiliation by the number of interlocks. Since board representation is a stable source of continuous information flows between the firm and the bank, it is a well suited measure to define bank-firm relations. We also take into account equity stakes of universal banks as a measure of affiliation.

For a unique sample of 129 companies listed in the period 1905-1909, we find that universal bank affiliation had a positive impact on the market-to-book ratio and return-on-assets. The effect on performance was positively related to the degree of bank involvement. Universal banks significantly reduced the volatility of return-on-assets. Stock return performance, measured by the Sharpe ratio, was also significantly better for affiliated corporations.

# I Introduction

Universal banks are financial institutions that offer an entire range of financial services. They commonly have the ability to mobilize large amounts of capital, and act as long-term investors, supporting companies in different ways. Despite the fact that they play an important role in many countries, universal banks have been controversial for over a century (e.g. Hilferding, 1910). Regarding the economic effects of universal banks, there are two opposing views (see for example Benston, 1994). The first view holds that universal banks are the most efficient institutions to overcome problems of asymmetric information, inevitably associated with external finance. Universal bank relations are characterized by a multitude of links which allow universal banks to reuse costly information and to build up technical expertise. The other view holds that universal banks are damaging because the multitude of links gives rise to conflicts of interest. The opponents assert that universal banks will run affiliated companies in their own interest especially in emerging economies with weak legal systems and poor investor protection. Consequently, multiple relations between companies and universal banks will not always reduce but may, on the contrary, increase agency problems.

While it is true that the costs and the benefits of universal bank relations are well understood, we have little insight in their relative magnitude. In part this is due to the fact that the historical debate on universal banks was clouded by ideological biases (Fohlin, 1999). Perhaps more important is the fact that researchers are faced with a scarcity of quantitative data to study universal banks in different institutional environments. The lack of data is especially acute for developing countries with weak institutions, where the risks of moral hazards loom large. In this respect, our paper takes a step forward by looking at the impact of universal bank involvement on the

performance of 129 listed Belgian companies over the period 1905-1909. Belgium in this period provides a particularly interesting environment to study universal banks for a number of reasons. First of all, universal banks were important in Belgium. It was the first country in continental Europe where the industrial revolution took off and economic historians have attributed a central role in the industrialization to universal banks. Second, the weak legal system and the poor investor protection arguably bear resemblance to the current economic situation in many developing countries. In addition, the time was characterized by unprecedented globalization, increasing international competition and extended financial development (Bordo and Meissner, 2005 and Obstfeld and Taylor, 2002). Finally, the period was marked by a financial crisis in 1907 that was strikingly similar to some crises experienced in the 1990's (Goodhart and Delargy, 1998).

We define affiliated companies as (i) companies that had director interlocks with one of the six main universal banks at that time in Belgium and (ii) companies in which one of the six main universal banks held an equity stake. We measure the extent of affiliation by the number of interlocks. Since board representation is a stable source of continuous information flows between the firm and the bank, it is a well suited measure to define bank-firm relations. We also take into account equity stakes of universal banks (as a percentage of the total listed shares on the Brussels Stock Exchange) as a measure of affiliation. We focus on both the level of performance and the volatility of performance since universal banks may not increase the level of performance but may add value by enabling affiliated companies to share risks. This conventional wisdom is endorsed by a voluminous literature on Japanese bank-centered corporate groups. Nakatani (1984) for example shows that the variance of operating profitability is lower for group affiliated companies than for unaffiliated

companies. Strachan (1976) in an early study of Central American business groups indicates that groups serve an insurance function in unstable markets.

Our results, based on a new, hand-collected dataset containing company level stock market and financial statement data, suggest that universal banks matter. We find that universal banks had a significant positive impact on company performance as measured by the market-to-book ratio and return-on-assets. Universal banks also significantly reduced the volatility of return-on-assets. Moreover, we find that the stock return performance, as measured by the Sharpe ratio, was significantly higher for affiliated companies than for sector and size matched control companies.

The remainder of the paper is structured as follows: section 2 briefly discusses universal banks in pre-world war Belgium; section 3 gives an overview of the literature and develops the hypotheses; section 4 discusses the construction of the sample and the variables. The empirical results are presented in section 5. Section 6 concludes.

## II Universal Banks in pre-World War I Belgium[1]

As early as 1822, King William I of the Netherlands established the "Algemeene Nederlandsche Maatschappij ter Begunstiging van de Volksvlijt" (known as "Société Générale pour Favoriser l'Industrie Nationale" or "Société Générale"), the world's first joint-stock investment bank (Cameron, 1967). At the time, Belgium was part of the United Kingdom of Low Countries. The Société Générale became active in industrial finance only after the Belgian revolution in 1830. Because of the revolutionary uprising and the preceding economic crisis, many companies were unable to fulfill their financial obligations and the Société Générale was forced to convert debt into shares. According to Kurgan-Van Hentenryk (1991), the bank played an active role in

the companies it controlled. The Société Générale transformed family businesses and partnerships into limited liability companies, subscribed to the shares and provided long-term lending. She organized horizontal and vertical integration and coordinated the affiliated companies. For example, in 1844, the bank established an engineering committee ("comité des ingénieurs") to advise mining companies in technical matters. In addition, the Société Générale established a common shipping office and a distribution network abroad. The Société Générale also influenced the corporate administration by professionalizing accounting and taking up mandates in the board of directors.

The Société Générale became the dominant universal bank in Belgium, but from 1873 onwards, when the legal burden for the establishment of joint stock companies was relaxed, new competitors emerged. While there were only 20 banks in 1870, their number increased to 46 in 1875. From 1880 onwards the expansion of the Belgian industry abroad led to the creation of several universal banks. According to Durviaux (1947), the number of universal banks increased from 8 in 1880 to over 25 in 1900. At the beginning of the 20$^{th}$ century, universal banks contributed most of the financing of new securities issued by Belgian companies, either by investing in securities themselves, or by selling securities to the public.

---
Insert Table I about here
---

Table I gives an overview of the structure of Belgian banking at end of 1913. The table illustrates the dominance of the Société Générale over the other Belgian universal banks. The Crédit Général Liégeois was the most important competitor of the Société Générale. The other important mixed banks in terms of the industrial portfolio were

Banque d'Outremer, Banque Liégeoise, Banque de Bruxelles and Banque Internationale de Bruxelles. However, the value of the industrial portfolios of the five major competing universal banks is 112.4 million franks while the value of the industrial portfolio of the Société Générale alone was 190.7 million francs despite the fact that the Société Générale used conservative valuations of its industrial portfolio. Furthermore, the sum of the assets the five major competitors equaled 553.8 million franks while the assets of the Société Générale alone amounted to 482.3 million franks.

## III Literature review and motivation

The abolition of the separation of commercial and investment banking in the United States and the efforts to industrialize developing countries and former communist countries recently provided an impetus for empirical inquiries into universal banking.

One topic that received a lot of attention is the role of (universal) banks in the underwriting of securities. Popular belief in the United States held that the participation of commercial banks in security underwriting caused the 1929 stock market crash and the ensuing instability of the banking system. The crash eventually led to the passing of the Glass-Steagall act, prohibiting securities underwriting by commercial banks, in 1933 (White, 1986). In the last decade the legal pendulum has swung back and commercial banks are again engaged in the underwriting of securities. Recent research revealed that, in the U.S., conflicts of interest did not lead commercial banks to underwrite inferior securities either in the pre or the post Glass-Steagall era. Commercial bank underwritten securities were priced higher than ex-ante similar offerings. In addition, public securities underwritten by commercial banks did not perform worse and sometimes better than securities underwritten by specialized investment banks (Drucker and Puri, 2006). International evidence on the other hand is

equivocal. In Canada, Hebb and Fraser (2002) find that ex-ante bond yields are lower for commercial bank underwritten securities, confirming the results found in the U.S. For Germany, Klein and Zoeller (2002) document higher underpricing and normal long-term performance of universal bank underwritten securities, indicating that investors rationally discount for conflicts of interest. In Japan, Takaoka and McKenzie (2006) and Konishi (2002) find evidence that banks are certifiers of value, net of conflicts of interest, while Liu and Kang (2004) and Hamao and Hoshi (2002) find weak evidence of conflicts of interest. Finally, Ber, Yafeh and Yosha (2001) uncover evidence of conflicts of interest in Israel when banks combine lending, underwriting and fund management.

Other studies investigate whether bank affiliation created value for affiliated companies (e.g. De Long, 1991 and Simon, 1998) or whether universal banks lowered the cost of external finance during the second industrial revolution (e.g. Ramirez, 1995, for the United States; Ramirez and Becht, 2003, and Fohlin, 1998, for Germany). De Long (1991) finds that firms with a Morgan partner on their board added between 6 and 30 percent to common stock equity value and about 15 percent to the total market value. De Long claims that Morgan added value by effectively monitoring firm managers and thus acting as a certifier of value for uninformed outside investors. Similarly, Simon (1998) finds that the withdrawal of a Morgan director from a company's board depressed company value about 7 percent. Other studies have investigated the effect of bankers on the board on the investment cash-flow relationship in historical perspective. Ramirez (1995) and Ramirez and Becht (2003) find that firms with a bank director were less liquidity constrained. Fohlin (1998) on the other hand finds that investment is more sensitive to cash-flow for companies affiliated to German banks.

Although the impact on performance is probably the most direct reflection of the complex interactions of universal bank incentives, few papers have related universal bank involvement directly to performance. Cable (1985), Gorton and Schmid (2000) and Chirinko and Elston (2005) for Germany; and Weinstein and Yafeh (1998) for Japan are counterexamples in this respect. The results of these studies are mixed. For Germany, Cable (1985) finds that there is a significant positive relationship between bank involvement and firm performance. Gorton and Schmid (2000) find that universal bank involvement in Germany is associated with higher market-to-book ratios of equity to the extent that banks have control rights from equity ownership. Chirinko and Elston (2005), using a different sample, conclude that universal bank affiliation does not increase performance in Germany. Similarly, Weinstein and Yafeh (1998) find that bank affiliated firms in Japan do not have higher profitability or growth.

Other studies look at the volatility of performance rather than the level of performance. Yafeh's (2003) survey suggests that of all roles attributed to Japan's corporate groups, risk sharing may be the most substantiated one. Academic research documented that keiretsu affiliates have lower variance of income than independent firms (Caves and Uekusa, 1976; Nakatani, 1984 and Genay, 1993). A form of risk sharing is the intervention by a keiretsu banks to assist member firms in financial distress (Hoshi, Kashap and Scharfstein, 1990). Another rationale for risk-sharing may exist if firms maximize the joint utility of financial institutions, stockholders and management. Employees and managers cannot easily diversify their human-capital investments. If risk sharing reduces required compensation for managers, it may be beneficial to shareholders as well (Khanna and Yafeh, 2005). Weinstein and Yafeh (1998) on the other hand, assert that banks as major debt holders are likely to be more risk-averse than equity holders.

Our paper contributes to the literature by looking at both the level and the volatility of performance of universal bank affiliated firms in Belgium over the period 1905-1909. Belgium in this period is a particularly interesting country to study for several reasons. First of all, Belgium combined an active stock market with powerful universal banks, refuting the view that active stock markets are incompatible with powerful banks. Rajan and Zingales (2003) find that in 1913, Belgium had the second largest fraction of gross fixed capital formation raised through equity and the largest number of publicly traded domestic companies per capita. Moreover, the ratio of stock market capitalization over GDP in Belgium (0.99) was similar to the ratio in the U.K. (1.09) and much higher than in the United States (0.39), Germany (0.44) or Japan (0.49). At the same time, the ratio of commercial and savings deposits over GDP indicates that the banking sector was more developed in Belgium (0.68) than in Germany (0.53), the U.S. (0.33), Japan (0.13) or the U.K. (0.10).

The combination of strong universal banks and an active stock market provides a different setting to evaluate the role of universal banks. While Weinstein and Yafeh (1998) suggest that in the absence of strong capital markets, large banks with close ties to industry will siphon profits and restrict investment, the impact of universal bank involvement in an economy with an active stock market is unclear. Economic historians claim that the universal banks were the driving force behind the industrialization in Belgium because they were able to finance ever larger investments in capital intensive industries (see e.g. Cameron, 1967, Van der Wee and Goossens, 1991; Kurgan-Van Hentenryk, 1991). According to Cameron (1967), industrial promotion and finance was the outstanding characteristic of the Belgian banking system while Durviaux (1947) describes how the universal banks played an important

role in the international expansion of Belgian companies[2]. This suggests that in the period considered Belgian universal banks created value for affiliated companies.

Contrary to economic historians, Fohlin (1999) asserts that, in Germany, many of the purportedly growth- and efficiency-enhancing features of universal banks emerged only to a limited extent during industrialization. She suggests that German banks may have developed as a by-product of social, political, and regulatory environments. Therefore, it is possible that banks had outlived their usefulness at the beginning of the 20th century. If it is true that universal banks managed to outlive their usefulness, we expect an insignificant or even a negative impact of universal bank involvement on company performance.

The time frame of the study is interesting as well. The period 1870-1913 was characterized by unprecedented globalization and recurring emerging market financial crises with great resonance for the experience we have observed in the past decade (Bordo and Meissner, 2005 and Goodhart and Delargy, 1998). One of these pre-World War One crises was the Panic of 1907. According to Bordo and Murshid (2001) the crisis of 1907 was probably the worst in terms of scope and virulence of the gold standard era. Many countries, including Belgium (Chlepner, 1930), were implicated.[3] The crisis was accompanied with large outflows of gold from Western European economies to the United States. These outflows in turn resulted in sharp increases in interest rates[4]. Hence, the 1907 crisis was an exogenous shock, which allows us to assess the role of universal banks in Belgium during a crisis that was felt worldwide. To the extent that universal banks helped companies to overcome temporary liquidity problems, we expect a positive effect of universal bank affiliation. On the other hand, Goodhart and Delargy (1998) argue that aggressive mixed bank lending to capital

intensive sectors, together with stock market support and containment of domestic consumption may have triggered the 1907 banking crisis. If this is true, we would expect a negative relation between universal bank involvement and performance. All the more because weak legal institutions and poor investor protection at the time gave universal banks a lot of latitude to loot affiliated firms in case of a crisis.

Finally, Belgium provides an interesting setting to study universal banks because the banking industry before the First World War was dominated by the "Société Générale". Fear of monopoly power of large institutions was among the motivations to separate investment banking from commercial banking in the United States (Roe, 1994). Monopoly power may allow the bank to extract rents from the company. For example, the bank may charge excessive fees for new loans or for the issuance of securities, while the company cannot credibly turn to another universal bank.

## IV Sample and Variables

### A Sample

We constructed a sample of listed Belgian companies during the period 1905-1909. We selected the four largest industries in terms of (i) the number of companies in the industry and (ii) the number of companies affiliated with a universal bank. This approach guarantees that the samples of affiliated and stand-alone companies are as large as possible. The industries under study are coal-mining, trams, railways and textiles. To be included in the sample, we require that a company had a listing on the Brussels Stock Exchange for at least one year. The companies listing or delisting in a particular year are therefore not considered in the year of listing or delisting.

Stock market data were collected from a database constructed at the University of Antwerp by the "StudieCentrum voor Onderneming en Beurs" (SCOB). The primary source of this database is the archive of the Brussels Stock Exchange. The data were hand-collected and double checked from various sources including the official quotation list and companies' correspondence with the exchange. The database includes all listed companies, contains information on share prices, dividends, the number of stocks outstanding and goes back as far as 1832 (Annaert et al., 1998). In addition, a sector classification code, based on the primary activity of the company, and a geographical code which identifies the location of the company's activity was assigned to each company. We restrict our sample to Belgian companies which have their main production facilities in Belgium.

We also collected financial statement data. The financial statement data were hand-collected data from the appendices to the Official Gazette ("Annexes au Moniteur Belge: Recueil Spécial des Actes des Sociétés"). This is the most reliable source of Belgian financial statement data for that period. All companies constituted under Belgian corporate law were legally required to publish their balance sheets and income statements in the Official Gazette no later than two weeks after the approval by the general meeting (Théate, 1905). At least one month before the annual meeting, the executive board of the company had to deliver a (non-public) report ("inventaire") to the supervisory board ("commissaires") for approval. After approval, an annual report containing the balance sheet and the income statement had to be deposited at the head office of the company and had to be sent to all nominal shareholders at least two weeks before the general meeting. The general meeting had to approve the annual report. For a number of companies we were able to obtain the annual report presented at the general meeting, and we found that the balance sheet and income statement presented

in the annual report were the same as the ones reported in the appendices of the Official Gazette.

Since the discretionary power of management to construct the financial statement was high, there is substantial heterogeneity in the structure of the financial statements and we had to reformat the financial statements into a uniform structure. Fortunately, the law provided guidelines about the depreciation of assets and the distribution of profits (Resteau, 1913a and 1913b) and we are able to check practitioners' guides to get a better understanding of the accounting principles at the turn of the century (François, 1902 and 1907).

After removing observations with missing values for the variables considered in the multivariate analysis, our sample consists of 566 firm-year observations for 129 different firms.

## B Affiliated companies

The identification of affiliated companies is a crucial matter, since the object of this study is to compare companies affiliated with universal banks to non-affiliated companies. Unfortunately, there is no agreement in the literature about the best way to measure affiliation. We use interlocking directors because a relationship at the board level represents a continuous interaction and information exchange between the firm and the bank. We also use the percentage of company shares held by the bank as an additional measure of bank affiliation.

As in Germany, the boards of Belgian companies had a dual structure, consisting of an executive board ("administrateurs") and a supervisory board ("commissaires"). The executive board members acted on behalf of and for the account of the company, they

were appointed by the articles of incorporation or by the general meeting of shareholders, and their responsibilities were limited by the company's articles of incorporation. The minimum number of executive board members was legally set at three and their mandate could not exceed six years. However, they were eligible for re-election. Supervisory board members were charged with the supervision of the executive board members and they had to approve the company's annual accounts. Like the executive board members, they were appointed by the general meeting of shareholders[5].

We collected data on the board of directors from the "Recueil Financier", a financial annual containing a variety of company-specific information, including the members of the board as well as their mandate (executive board or supervisory board). To check the accuracy of the "Recueil Financier", we compared the information in the "Receuil Financier" with the entries in the appendices of the Official Gazette for a sub-sample of companies and found no differences. We consider interlocks with six different universal banks: (i) the Société Générale; (ii) the Crédit Général Liégeois; (iii) the Banque d'Outremer; (iv) the Banque Liégeoise; (v) the Banque de Bruxelles and (vi) the Banque Internationale de Bruxelles. These were the most important listed universal banks both in terms of total assets and the value of the industrial portfolio (Table I).[6]

As a consequence of the two-tier board structure, four different types of board interlocks can be considered: bank executive board – company executive board; bank executive board - company supervisory board; bank supervisory board – company executive board; and bank supervisory board – company supervisory board. While executive board members of universal banks held a significant number of directorships in other companies, their supervisory peers rarely held directorships in other

companies[7]. We therefore define a company as affiliated with a universal bank if an executive board member of the bank is on the executive board of that company.

When relating performance to bank affiliation, one has to be wary of reverse causality i.e. better performing firms may attract bank interlocks or poor performers may loose bank support. However, economic historians claim that universal banks typically built up long-term relations and supported affiliated companies from the cradle to the grave (e.g. Durviaux for Belgium and Fohlin, 1999 for Germany). Nevertheless, to minimize the risk of selection problems, we use board interlocks based on the boards of 1905[8]. In addition, we investigated board interlocks in 1895. If universal banks were actively selecting better performing firms, we would expect to see substantial variation in bank interlocks. However, we found to the contrary that few companies changed status. We were able find interlocks for 68 companies of our 1905-1909 sample in 1895, of which 28 (41%) had a banker on their board. Of these 28 companies, 24 (86%) were still had a banker on their board in 1905. On the other hand, of the 40 companies without interlock in 1895, 32 (80%) were still unaffiliated in 1905. Only eight companies became affiliated between 1895 and 1905, of which 4 became affiliated with the Crédit Général Liégeois. This reflects a growing importance of the Crédit Général Liégeois over the period. Taken together the data suggest that universal banks indeed supported affiliated companies for longer periods and were not actively selecting better performing firms or dropping poor performers.

---
Insert Table II about here
---

Panel A of Table II depicts the number of bank interlocks and the number of banks interlocked with the 129 companies in the coal mining, trams, railways and textiles

industries. 48 companies had an interlock with a universal bank. The highest number of interlocks for a company is four (six companies), but most companies either have one interlock (24 companies) or two interlocks (10 companies). 36 companies are interlocked with one universal bank, 10 companies are interlocked with two banks and 2 companies are interlocked with three different universal banks.

Panel B of Table II shows the number of companies interlocked with each universal bank. The Société Générale (20) and the Crédit Général Liégeois (19) have the largest number of company interlocks, which is consistent with the fact that these two banks had a larger industrial portfolio than any other Belgian universal bank (see Table I). Interestingly, the Société Générale has on average 1.85 company interlocks; the Crédit Général Liégeois has on average 1.53 interlocks. This is more than the Banque Internationale de Bruxelles (1.50); the Banque Liégeoise (1.33); the Banque de Bruxelles (1.17) and the Banque d'Outremer (1.00). This suggests that the Société Générale and the Crédit Général Liégeois (the two largest universal banks) were more involved in the management of companies to which they were affiliated than the other universal banks.

Panel B of Table II also reports the equity stakes of the banks in the coal mining, trams, railways and textiles industries. It could be argued that equity stakes are a better indicator of bank involvement in the company than interlocks, since underperformance of the company has direct pecuniary implications on the value of the equity holdings. However, the universal banks provided services to companies which are not necessarily related to equity stakes, such as the provision of loans and the underwriting of new securities.

The data on the equity stakes were collected from the "Recueil Financier", which listed the industrial portfolio of the banks considered in this study. We are able to identify only 16 companies in which a bank had an equity stake, of which 11 coal mining companies in which the Société Générale had a stake[9]. The limited number of bank equity stakes we find is remarkable, as studies on the history of Belgian universal banks tend to stress the role of these banks as equity investors (see for example Kurgan-Van Hentenryk, 1991). However, our results are consistent with the conclusion of Fohlin (2006) that German banks in the late 19th century owned few equity stakes in non-financial companies. While the literature on Belgian universal banks tends to focus almost exclusively on the Société Générale, which was by far the most important Belgian universal bank, our results suggest that the strategy of other Belgian universal banks may have been quite different from that of the Société Générale.

The average percentage of shares held by the Société Générale was 21.10%, with a maximum of 47.62%.[10] Although there were no legal restrictions on the percentage of shares a single shareholder could buy, the relatively small percentage of direct stakes can be traced to institutional reasons: in order to prevent large shareholders from dominating the general meeting, the law stipulated that a single shareholder could not vote for more than twenty percent of the issued stocks or for more than forty percent of the capital represented at the general meeting (Resteau, 1913b).

Companies usually stayed in the portfolio for very long periods. In fact, of the companies present in the portfolio of the Société Générale in 1905, five were already in the portfolio in 1865 and all companies were in the portfolio of 1900. Furthermore, all companies except one were still in the portfolio of the Société Générale in 1928. This suggests that the Société Générale maintained long-term relations with affiliated

companies and that the potential for selection bias in affiliation based on equity stakes is limited. Moreover, if the Société Générale actively selected better performing (or removed underperforming) companies, we would see a lot of variation in the industrial portfolio.

## C Variables

As performance measures, we use the market-to-book ratio of equity (MTB) as a market-based measure of profitability, and return-on-assets (ROA) as an accounting data based measure. MTB is the previous year-end market value of equity divided by the book value of equity at the beginning of the year (we linearly interpolate the book value of equity for the firms with other than calendar fiscal years).[11] ROA is defined as sales minus direct production costs, indirect production costs (e.g. overhaul, electricity, etc.) and salaries, divided by the book value of total assets at the beginning of the fiscal year. To measure the volatility of performance, we use the standard deviation of ROA.

We also include a number of control variables in the regression models. These control variables are (i) the total debt ratio, defined as the book value of total debt at the beginning of the fiscal year divided by total assets at the beginning of the fiscal year; (ii) size of the company, measured by the natural logarithm of total assets at the beginning of the fiscal year; and (iii) the age of the company as the difference between the current year and the year the company transformed to a limited liability company. We also include industry dummies for the tram sector, the railways sector and the textiles sector. For the coal mining sector, we include four geographical dummies which indicate the location where the coal mining company operates and refer to geological conditions. They measure differences in the quality of extracted coal or the

difficulty to extract coal in a particular region (Wautelet, 1976). Finally, we include year fixed effects in each regression.

---
Insert Table III about here
---

## V Empirical Results

### A Universal Bank Affiliation and Company Performance

Table III presents descriptive statistics for companies in the coal mining, trams and railways industries. Univariate results indicate that the mean MTB-ratio is significantly higher for universal bank affiliated firms. The mean ROA is also higher for affiliated firms, but the difference in means is not significantly different from zero. Moreover, the table reveals that affiliated companies have higher leverage, and are both larger and older than their unaffiliated peers. It is therefore important to control for these factors in a multivariate analysis.

We estimate the following equation using a random effects model:[12]

$$\begin{aligned} Performance_{i,t} = {} & a_1 \times Affiliation_i + a_2 \times Debt\ Ratio_{i,t} + a_3 \times Age_{i,t} + a_4 \times Size_{i,t} \\ & + b \times Industry\ Effects + c \times Year\ Fixed\ Effects \end{aligned} \quad (1)$$

To asses the significance of the estimated coefficients, we use clustered standard errors. Standard errors clustered by firm account for the fact that standard errors of regression coefficients are downward biased if residuals are correlated across time for a given firm. When both a firm and a time effect are present in the data, the time effect can be addressed by including time dummies and then estimate standard errors clustered on the other dimension (Petersen, 2006).[13]

---
Insert Table IVabout here
---

---
Insert Table Vabout here
---

Table IV displays the results for regressions in which the market-to-book ratio of equity is the dependent variable. In Table V, ROA is the dependent variable. In regression (1) (Table IV) and regression (6) (Table V), affiliation is measured as dummy variable which takes a value of one if an executive board member of the bank is also on the board of the company and zero otherwise. The results indicate that a banker on the board has a positive impact on both MTB and ROA. However, the relation is only significant for the MTB-ratio (p-value = 0.024).

In a second step, affiliation is defined as the number of executive bankers on the board of a company (regression (2) in Table IV and regression (7) in Table V). We consider the number of interlocking directors as a proxy for the amount of control exercised by the bank. Theoretically, the effect of more bankers on the board is ambiguous. On the one hand, more board members give the bank more power to monitor the company. On the other hand, the bank can use its influence in the board to act in its own interest: the higher the degree of control, the more investors should fear expropriation by the bank. The regressions reinforce the results based on the dummy variable. We find that both MTB ratio (at the 1% significance level) and ROA (at the 5% significance level) are significantly higher for universal bank affiliated firms.[14]

It could be argued that if banks act as outside investors, they have a stronger incentive to create value if they hold equity in the firm. Therefore, we use the equity stake of the

bank in the company as a measure of affiliation in regressions (3) (Table IV) and (8) (Table V). For both MTB and ROA we find that the equity stake coefficient is positive but not significantly different from zero.

In a fourth step, we include both the dummy variable and the number of interlocks as measures of affiliation (regression (4) in Table IV and regression (9) in Table V). This allows us to know whether the extent of control rather than control in itself is important. Again, we find that the amount of control has a significant positive impact on both MTB and ROA. The regression coefficient on the dummy variable on the other hand, is insignificant. We conclude that it is important to take into account the degree of bank influence on the firm.

We also measure affiliation by including both the number of interlocks and the equity stakes in the same equation (regression (5) in Table IV and regression (10) in Table V). Again we find that the coefficient on the number of interlocking directors is significantly positive for both the MTB ratio and ROA while the coefficient on the equity stake is insignificant. However, it should be taken into account that of the universal banks considered in this study, it was mainly the Société Générale which held equity stakes in affiliated companies, and which had more than one director on the board of affiliated companies. The results on the impact of bank equity stakes and multiple bank directors may therefore be driven by the idiosyncratic nature of the Société Générale. On the other hand, it should be noted that in the period considered, the Société Générale was by far the most important universal bank in Belgium.

Taken together, our results from Table IV and Table V imply that universal banks mattered. We conclude that universal bank interlocks created value for firms which had a banker on their board.

---
Insert Table VI about here
---

It could be argued that the number of bank interlocks is not a good measure of bank control, as the number of bank interlocks is related to the number of interlocked banks (cf. Table II). We therefore split the total number of bank interlocks in (i) the number of interlocked banks and (ii) the total number of bank interlocks minus the number of interlocked banks. The second variable reflects the number of bank interlocks, additional to the first interlock with a universal bank. The results are reported in Table VI. Regression (11) confirms that an interlock with a universal bank positively affects the MTB ratio of the firm (p-value equals 0.076). A higher degree of bank control further increases the MTB ratio, although the increase is not statistically different from zero. For ROA (regression (12)), we find that both the coefficients of the number of interlocked banks and the difference between the number of interlocks and the number of interlocked banks are positive. Although the coefficient on the number of banks is not significantly different from zero, the coefficient measuring the degree of bank control is significantly positive at the 5% significance level. This suggests that higher control levels of the bank are associated with higher ROA.

## B Universal Bank affiliation and Risk

Universal bank affiliation may be beneficial for affiliated companies because of the risk sharing potential among affiliated firms. This conventional wisdom is buttressed by a literature on Japanese Keiretsu. Caves and Uekusa (1976), Nakatani (1984) and Genay (1993) for example provide empirical evidence that the variance of operating profitability is lower for group affiliated than for unaffiliated companies. While

Yafeh's (2003) survey suggests that of all roles attributed to Japan's corporate groups, risk sharing may be the most substantiated one. The possibility of risk sharing in business groups is consistent with economic theory because, in the presence of capital market imperfections, bankruptcy costs may be substantial. For example, Sheard (1989), Hoshi, Kashyap and Scharfstein (1990) and Hoshi and Kashyap (2001) document cases in which banks rescued distressed affiliates. Another rationale for risk sharing is that companies maximize the joint utility of employees, financial institutions, stockholders and management (Aoki 1984, 1988). Khanna and Yafeh (2005) investigate risk sharing for business group affiliates in a number of different countries. We use their methodology to test whether universal bank affiliates had lower volatility of ROA. We extend their basic equation with average debt ratio and average age for consistency with our earlier regressions[15]. We estimate the following equation:

$$\begin{aligned}\sigma_{ROA} = {} & a_1 \times Affiliation + a_2 \times \overline{ROA} + a_3 \times \overline{Debt\ Ratio} + a_4 \times \overline{Age} \\ & + a_5 \times \overline{Size} + b \times Industry\ Effects\end{aligned} \tag{2}$$

where $\overline{ROA}$, $\overline{Debt\ Ratio}$, $\overline{Age}$ and $\overline{Size}$ are the averages calculated over the period for which data were available.

---
Insert Table VII about here
---

The results of the regressions are summarized in Table VII. In regression (13), we use a dummy variable indicating a director interlock between the company and a universal bank. We find that volatility is significantly lower for affiliated companies (p-value equals 0.011). This is a strong result in comparison with the sample of Khanna and Yafeh (2005). The most significant reduction they find is only significant at the 5%

significance level (for companies affiliated to business groups in Taiwan and postwar Japan). Our results are economically significant as well. Universal bank affiliation reduces the standard deviation of operating profit by 1.46% while the sample average standard deviation is only 4%.

Following the structure of the previous section, we measure affiliation as the number of interlocks in regression (14). The results reinforce the results based on the interlock dummy. We find that volatility significantly reduces with increasing interlocks (p-value = 0.003). In regression (15) we include both the dummy variable and the number of interlocks as measures of affiliation. While we find that both coefficients are negative, none is significant.

Taken together the results in Table VII imply that the bankers not only added value by increasing the profitability (MTB and ROA). They also provided risk sharing benefits to affiliated companies as is reflected by the lower standard deviation of ROA.

### C Universal Bank affiliation and the Risk-Return Relation

Next, we use the Sharpe ratio to compare the performance of affiliated companies with their unaffiliated counterparts. As in the previous sections, a company is assumed to be affiliated with a universal bank if an executive board member of the bank is also on the executive board of the company. We construct a portfolio of affiliated companies and a control portfolio of sector and size matched companies. To find a matched firm, we look for an unaffiliated company within the same sector which has the book value of total assets closest to the book value of total assets of the affiliated company (we use the book value of total assets at the beginning of the fiscal year). This implies that an

unaffiliated company can be used as a control firm more than once in the control portfolio.[16]

The Jobson-Korkie test (Jobson and Korkie, 1981)[17] allows us to test for differences in the performance of the two portfolios. Under the null hypothesis that the Sharpe ratios of two portfolios are equal, the test statistic asymptotically follows a standard normal distribution. The test statistic is defined as:

$$JK_{i,j} = \frac{\hat{\mu}_i \times \hat{\sigma}_j - \hat{\mu}_j \times \hat{\sigma}_i}{\sqrt{\hat{\theta}}}, \tag{3}$$

where:

$$\hat{\theta} = \frac{1}{T}\left[2\hat{\sigma}_i^2\hat{\sigma}_j^2 - 2\hat{\sigma}_i\hat{\sigma}_j\hat{\sigma}_{ij} + \frac{1}{2}\hat{\mu}_i^2\hat{\sigma}_j^2 + \frac{1}{2}\hat{\mu}_j^2\hat{\sigma}_i^2 - \frac{\hat{\mu}_i\hat{\mu}_j}{2\hat{\sigma}_i\hat{\sigma}_j}\left(\hat{\sigma}_{ij}^2 + \hat{\sigma}_i^2\hat{\sigma}_j^2\right)\right].$$

$\hat{\mu}_i$ is the ex-post average excess return of portfolio *i*, $\hat{\sigma}_i$ is the ex-post standard deviation of the excess returns of portfolio *i*, $\hat{\sigma}_{ij}$ is the ex-post covariance between the excess returns of portfolios *i* and *j* and $T$ is the number of observations in the sample.

---
Insert Table VIII about here
---

The results in Table VIII reveal that both the equally weighted (panel A) and the value weighted (panel B) portfolios of affiliated companies have higher Sharpe ratios than the portfolios of unaffiliated companies. Moreover, for equally weighted and value weighted portfolios of affiliated companies combine higher average excess returns with lower standard deviations of monthly excess returns. For the equally weighted portfolios, the Jobson-Korkie reveals that the portfolio of affiliated companies

outperformed the portfolio of control companies. However, for the value weighted portfolios the Jobson-Korkie test cannot reject the null hypothesis of equal Sharpe ratios. This may illustrate the low power of the Jobson-Korkie test. Given the low power of the test, the overall results suggest that the affiliated companies had better risk-return characteristics than unaffiliated companies.

## VI Conclusion

There are two opposing views about the economic role of universal banks. On the one hand, it has been argued that universal banks are efficient institutions to overcome problems of asymmetric information. A more pessimistic view holds that multiple relations between a universal bank and affiliated companies allow the bank to loot these companies at the expense of other investors, especially in emerging economies which are characterized by weak legal systems and poor investor protection. Historical Belgium provides a unique setting to assess the role of universal banks. Belgium combined strong stock markets and dominant universal banks, refuting the view that active stock markets are incompatible with strong banks. Moreover, universal banking originated in Belgium, the first country in continental Europe to industrialize, and economic historians claim universal banks were the driving force behind the industrialization.

Our results are inconsistent with the pessimistic view on universal banks. We find that in pre-World War Belgium, which was characterized by weak legal institutions and poor investor protection, companies which a bank director on their executive board had higher MTB ratios and higher ROA than other companies. Moreover, we find that the positive impact is increasing in the degree of control exercised by the banks. In addition, universal bank involvement significantly reduces the volatility of operating

profits, suggesting that universal bank affiliation provided risk sharing benefits for affiliated companies. Finally, we find that the Sharpe ratio is higher for portfolios of affiliated companies than for portfolios of sector and size matched control companies.

Taken together our results suggest that the gloomy view of universal banks may be too pessimistic. We find evidence that a universal bank relation may benefit companies in emerging economies with weak legal institutions and poor investor protection.

## References


Annaert, Jan, Frans Buelens, Ludo Cuyvers, Marc J. K. De Ceuster, Greta Devos, Marc Gemis, Helma Houtman-De Smedt, Jan Paredaens, and Hans Willems, 1998, A new historical database for the Brussels stock exchange: 1832-1914, Working Paper University of Antwerp

Aoki, Masahiko, 1984, Risk sharing in the corporate group, in Masahiko, Aoki, ed.: *The economic analysis of the Japanese firm* (North-Holland).

Aoki, Masahiko, 1988. *Information, incentives and bargaining in the Japanese economy* (Cambridge University Press).

Benston, George J, 1994, Universal banking, *Journal of Economic Perspectives* 8, 121-143.

Ber, Hedva, Yishay Yafeh, and Oved Yosha, 2001, Conflict of interest in universal banking: bank lending, stock underwriting and fund management. *Journal of Monetary Economics* 47, 189-218.

Bordo, Michael D, and David C. Wheelock, 1998, Price stability and financial stability: the historical record. *Federal Reserve Bank of St Louis Review* 80, 41-62.

Bordo, Michael D, and Antu P. Murshid, 2000, Are financial crises becoming increasingly more contagious? what is the historical evidence on contagion?, Working Paper, NBER.

Bordo, Michael D, and Christopher M. Meissner, 2005, The role of foreign currency debt in financial crises: 1880-1913 vs. 1972-1997, Working Paper, NBER.

Cable, John, 1985, Capital market information and industrial performance: the role of West German banks, *Economic Journal* 95, 118-132.

Cameron, Rondo E, 1967. *Banking in the early stages of industrialization: a study in comparative economic history* (Oxford University Press).

Caves, Richardson S, and Masu Uekusa, 1976. *Industrial organization in Japan* (The Brookings institution).

Chirinko, Robert S, and Julie A. Elston, 2006, Finance, control and profitability: an evaluation of German bank influence, *Journal of Economic Behavior and Organization* 59, 69-88.

Chlepner, B.S., 1930. *Le marché financier Belge depuis cent ans* (Falk).

De Long, Bradford. J, 1991, Did J. P. Morgan's men add value? an economist's perspective on financial capitalism, in Peter Temin, ed.: *Inside business entreprise: historical perspectives on the use of information (*University of Chicago Press).

Drucker, Steven, and Manju Puri, 2006, Banks in capital markets: a survey, In Espen B. Eckbo Ed.: *Handbook in corporate finance: empirical corporate finance,* (North-Holland, forthcoming).

Durviaux, Roland, 1947, La Banque Mixte : Origine et soutien de l'expansion economique de la Belgique (Etablissements Emile Bruylant).

Eichengreen, Barry, and Michael D. Bordo, 2002, crises now and then: what lessons from the last era of financial globalization?, Working Paper, NBER.

Fohlin, Caroline, 1998, Relationship banking, liquidity and the German industrialization, *Journal of Finance* 53, 1737-1758.

Fohlin, Caroline, 1999, Universal banking in pre-World War I Germany: model or myth?, *Explorations in Economic History* 36, 305-343.

Fohlin, Caroline, 2006, Financial empire: new perspectives on finance, governance and performance in the German industrialization (Cambridge University Press, forthcoming).

François, Amédée, 1902, Principes de comptabilité des sociétés par actions à l'usage des administrateurs, commissaires, directeurs et actionnaires de sociétés (Vandeweghe).

François, Amédée, 1907, Inventaires et bilans dans les sociétés par actions (Vandeweghe).

Genay, Hesna, 1993, Japan's corporate groups, In Robert W. Kolb ed.: *The International Finance Reader* ( Kolb Publishing Company).

Goodhart, Charles, and P. J. R. Delargy, 1998, Financial crises: plus ça change, plus c'est la même chose, Working Paper, London School of Economics

Gorton, Gary, and Frank A. Schmid, 2000, Universal banking and the performance of German firms *Journal of Financial Economics* 58, 29-80.

Hamao, Yasushi and Takeo Hoshi, 2003, Bank underwriting of corporate bonds: evidence from Japan after the financial reform of 1993, Working Paper, University of Southern California.

Hebb, Gregory M, and Donald R. Fraser, 2002, Conflicts of interest in commercial bank security underwritings: Canadian evidence *Journal of Banking and Finance* 26, 1935-1949.

Hilferding, Rudolf, 1910, Das finanzkaptial, (Wiener Volksbuchhandlung).

Hoshi, Takeo, and Anil K. Kashyap, 2001, Corporate financing and governance in Japan: the road to the future (Cambridge University Press).

Hoshi, Takeo, Anil K Kashyap, and David Scharfstein, 1990, The role of banks in reducing the costs of distress in Japan *Journal of Financial Economics* 27, 67-88.

Jobson, Dave J, and Bob M. Korkie, 1981, Performance hypothesis testing with the Sharpe and Treynor measures, *Journal of Finance* 36, 889-908.

Jorion, Philippe, 1991, Bayesian and CAPM estimatiors of the means: implications for portfolio selection, *Journal of Banking and Finance* 15, 717-727.

Kang, Jun-Koo, and Wei-Lin Liu, 2003, Is universal banking justified? Evidence from Bank underwriting of corporate bonds in Japan, American Finance Association 2005 Philadelphia Meetings.

Khanna, Tarun, and Yishay Yafeh, 2005, Business groups and risk sharing around the world, *Journal of Business* 78, 301-340.

Klein, Peter G, and Kathrin Zoeller, 2003, Universal banking and conflicts of interests: evidence from German initial public offerings. Working Paper, University of Missouri.

Konishi, Masaru, 2002, Bond underwriting by banks and conflicts of interest: evidence from Japan during the pre-War period, *Journal of Banking and Finance* 26, 767-793.

Kurgan-Van Hentenryk, Ginette, 1991, Finance and financiers in Belgium, 1880-1914, in Youssef Cassis, ed.: *Finance and Financiers in European History, 1880-1960*, (Cambridge University Press).

Nakatani, Iwao, 1984, The economic role of financial corporate grouping, in Masahiko, Aoki, ed.: *The Economic Analysis of the Japanese Firm,* ( North-Holland).

Obstfeld, Maurice, and Allan M. Taylor, 2002, Globalization and capital markets, Working Paper NBER.

Petersen, Mitchell A., 2006, Estimating standard errors in finance panel data sets: comparing approaches, http://www.kellogg.northwestern.edu/faculty/petersen/htm/papers/standarderror.htm

Rajan, Raghuram G., and Luigi Zingales, 1998, Financial dependence and growth, *The American Economic Review* 88, 559-586.

Rajan, Raghuram G., and Luigi Zingales, 2003, The great reversals: The politics of financial development in the 20th century, *Journal of Financial Economics* 69, 5-50.

Ramirez, Carlos D, and Marco Becht, 2003, Does bank affiliation mitigate liquidity constraints? evidence from Germany's universal banks in Pre-World War I Period, *Southern Economic Journal* 70, 254-272.

Ramirez, Carlos D, 1995, Did J. P. Morgan's men add liquidity? corporate investment, cash-flow and financial structure at the turn of the twentieth century, *Journal of Finance* 50, 661-678.

Resteau, Charles, 1913a, Commentaire législatif de la loi du 25 Mai 1913 portant modifications aux lois sur les sociétés anonymes (Imprimerie Veuve Ferdinand Larcier).

Resteau, Charles, 1913b, Les sociétés anonymes devant les lois belges, (Imprimerie Veuve Ferdinand Larcier).

Roe, Mark J., 1994, Strong managers weak owners: the political roots of American corporate finance, (Princeton University Press).

Simon, Miguel C., 1998. The rise and fall of Bank control in the United States: 1890-1939, *American Economic Review* 88, 1077-1093.

Sheard, Paul, 1989, The main bank system and corporate monitoring and control in Japan, *Journal of Economic Behavior and Organization* 11, 399-422.

Strachan, Harry W., 1976, Family and other business groups in economic development: The case of Nicaragua (Praeger Press).

Takaoka, Sumiko and C. R. McKenzie, 2006, The impact of bank entry in the Japanese corporate bond underwriting market, *Journal of Banking and Finance* 30, 59-83.

Théate, Théophile, 1905, *Les sociétés anonymes: abus et remèdes* (Mish & Thron).

Van der Wee, Herman, and Martine Goossens, 1991, Belgium, In Rondo E. Cameron and Valerii I Bovykin, Ed.; *International Banking 1870-1914*, (Oxford University Press).

Wautelet, Jean-Marie, 1976, Dynamique de l'accumulation dans les charbonnages belges (1886-1914). une approche par les bilans, Working Paper, CREHDIS.

Weinstein, David E, and Yishay Yafeh, 1998, On the costs of a bank centered financial system: evidence from the changing main bank relations in Japan, *Journal of Finance*, 53, 653-672.

White, Eugene N, 1986, Before the Glass-Steagall act: an analysis of the investment banking activities of national banks, *Explorations in Economic History* 23, 33-55.

Yafeh, Yishay, 2003. Japan's Corporate Groups: Some International and Historical Perspectives, In Magnus Blomström, Jenifer Corbett, Fumio Hyashi and Anil K. Kashyap, eds.: *Structural impediments to growth in Japan* (University of Chicago Press).

## Notes

[1] Chlepner (1930, Chapter IV – Section 5) and Durviaux (1947, chapter IV) offer a detailed overview of the Belgian Banking sector from 1875 to 1914.

[2] Belgian companies accepted securities of their customers as a form of payment. These securities were subsequently floated on the stock market with the support of the universal banks.

[3] See Eichengreen and Bordo (1999) for a list of countries that were affected by the 1907 crisis.

[4] Bordo and Wheelock (1998) indicate that that the Bank of England increased the discount rate from 3.5% to 6% in September 1906 and refused to rediscount American discount bills in defense of the pound sterling. Goodhart and Delargy (1998) document an increase in interest rates in France from 4% to 7.5% during 1907. In Belgium the discount rate of the Belgian national bank was increased from 3% to 4.5% during 1907, while the discount rate for foreign discount bills increased from 3.5% in September 1906 to a peak of 6% in November 1907.

[5] Belgian companies could set up a "conseil général", which united the executive and the supervisory board. The responsibilities of the "conseil general" were defined in the articles of incorporation. Usually they related to exceptional decisions like the issue of bonds or the purchase of a new building. Contemporaneous commentators regretted the fact that the law did not prohibit the existence of this body, because it constituted an effective way to suppress the responsibility of the supervisory board (e.g. Resteau, 1913b).

[6] We also performed the regressions in which companies that had an interlock with any of the universal banks listed in Table I were considered as affiliated. The results were qualitatively the same.

[7] Moreover, as Fohlin (1999) notes, the bank supervisory board members may very well be industrialists sitting on the supervisory board of the bank, while we are interested in bank directors representing the interests of the bank.

[8] For some companies that went public after 1905, we also used the 1905 board if it was available in the Recueil Financier. If it was not available, we used the board from the year the listing started.

[9] We cannot rule out the possibility that the banks also had some indirect stakes in the companies considered in this study through holding companies, even though the use of holding companies in the period considered was rather limited, compared to the post World War I era. For some of these holding companies the portfolio of equity stakes is not fully available. In those cases where we did find information on indirect equity stakes of the banks considered, none of these stakes applied to the companies considered in this study.

[10] Not surprisingly, the average number of interlocks of the Société Générale with the companies in which it had an equity stake is rather high at 2.33. For only two companies in which the bank had an equity stake, the bank has one interlock.

[11] We also did the analysis excluding the firms for which the calendar year did not coincide with the fiscal year. The results (not reported) were qualitatively the same.

[12] The affiliation variable, based on interlocking directors in 1905, is time invariant. As a consequence we cannot estimate fixed-effects models. However, we also estimated the equation using a pooled model; the results (not reported) are qualitatively the same.

[13] The random effects model with clustered standard errors produces only unbiased standard errors when the firm effect is permanent. In a pooled regression, the standard errors are unbiased whether the firm effect is permanent or temporary (Petersen, 2006). Therefore, we estimated all equations using pooled OLS with clustered standard errors as well. The results were qualitatively the same as those for the random effects model.

[14] We also performed regressions where the number of interlocks is scaled by the board size of the affiliated company. The results were qualitatively similar.

[15] We also used the basic regression equation proposed by Khanna and Yafeh (2005) and found similar results.

[16] Because the lower number of firms in the control portfolio may lead to a higher volatility in the control portfolio, we also did the analysis with portfolios containing the same number of firms. The results (not reported) were qualitatively the same.

[17] The test is widely used in the economic literature (e.g. Jorion, 1991) and, since it is based on Sharpe ratios it has the advantage that it does not rely on the validity of an underlying asset pricing model. Furthermore, the test statistic is well behaved, even for small sample sizes. On the other hand, the test suffers from low power in detecting differences with monthly data and when the coefficients of variation of the return series are large (Jobson and Korkie, 1981).

## Table I

## Universal Banks in Belgium

The table displays the industrial portfolio and total assets of Belgian universal banks on 31 December 1913. (*Source:* Durviaux, 1947, pp 82-83 and Annexe V- the reported values are in millions Belgian francs)

| **Société Générale Group** | Industrial Portfolio | Total Assets |
|---|---|---|
| Société Générale | 185.5 | 482.3 |
| Banque Belge pour l'étranger* | n.a. | 166.3 |
| Banque d'Anvers | 3.3 | 157.0 |
| Banque Italo-Belge* | 1.9 | 89.3 |
| Other banks affiliated to the Société Générale (18) | n.a. | 534.8 |
| **Total** | **190.7** | **1,429.7** |
| **Other Universal Banks** | Industrial Portfolio | Total Assets |
| Crédit Général Liégeois | 45.0 | 149.2 |
| Banque d'Outremer | 26.0 | 99.6 |
| Banque Liégeoise | 21.0 | 56.1 |
| Banque de Bruxelles | 10.5 | 100.9 |
| Banque Internationale de Bruxelles | 9.9 | 100.0 |
| Crédit Général de Belgique | 8.3 | 19.6 |
| Crédit National Industriel | 4.8 | 16.8 |
| Banque Générale Belge | 2.4 | 104.1 |
| Comptoir d'escompte de Bruxelles | 0.6 | 22.3 |
| **Total** | **128.5** | **668.6** |

***** The "Banque Belge pour l'Étranger" and The "Banque Italo-Belge" are two banks set up to support exports. The former towards China and the latter towards South-America

## Table II

### Universal Bank Affiliation: Number of Interlocks, Number of Banks Interlocked, and Equity Stakes Held by Universal Banks

This table reports the number of interlocks with a universal bank and the number of interlocked banks (Panel A), and the company interlocks and equity stakes for each universal bank (Panel B). Interlocks are calculated based on boards in 1905 if available. If the board of directors in 1905 was not available, we used the first year for which it was available. The sample consists of 129 listed Belgian companies in the coal mining, trams railways and textiles industries. A company is interlocked with a universal bank if an executive director of the bank is also a member of the executive board of the company.

**Panel A:** Number of Bank Interlocks and Number of Banks Interlocked

| Number of Bank Interlocks | Number of Banks Interlocked → | | | |
|---|---|---|---|---|
| ↓ | 1 | 2 | 3 | Total |
| 1 | 24 | | | 24 |
| 2 | 8 | 2 | | 10 |
| 3 | 3 | 5 | 0 | 8 |
| 4 | 1 | 3 | 2 | 6 |
| Total | 36 | 10 | 2 | 48 |

**Panel B:** Company Interlocks and Equity Stakes for each Universal Bank

| Universal Bank | Number of companies interlocked | Average number of interlocks | Number of equity stakes | Average percentage of shares held |
|---|---|---|---|---|
| Société Générale | 20 | 1.85 | 12 | 21.10% (*) |
| Crédit Général Liégeois | 19 | 1.53 | 3 | 26.18% |
| Banque d'Outremer | 12 | 1.00 | 0 | |
| Banque de Bruxelles | 6 | 1.17 | 1 | 3.71% |
| Banque Liégeoise | 3 | 1.33 | 0 | |
| Banque Internationale de Bruxelles | 2 | 1.50 | 0 | |

(*) The maximum percentage of shares held by the Société Générale is 47.62%

## Table III

## Descriptive Statistics

This table reports descriptive statistics for a sample of 129 listed Belgian companies in the coal mining, trams, railways and textiles industries over the period 1905-1909. Companies are categorized as affiliated if an executive director of a universal bank is a member of the executive board of the company, and as a stand-alone company otherwise. The market-to-book ratio of equity (MTB) is the previous year-end market value of equity divided by the book value of equity at the beginning of the year; Return-on-assets (ROA) is defined as sales minus direct production costs, indirect production costs (e.g. overhaul, electricity, etc.) and salaries, divided by the book value of total assets at the beginning of the fiscal year; (ii) Debt ratio is defined as the book value of total debt at the beginning of the fiscal year divided by total assets at the beginning of the fiscal year; (iii) size of the company, measured by the natural logarithm of total assets at the beginning of the fiscal year; and (iv) the age of the company as the difference between the current year and the year the company transformed to a limited liability company. *, **, and *** indicate that the difference in means of the variables between affiliated and unaffiliated firms are significantly different at the 10%, 5% and 1% significance level respectively (two-tailed).

**Panel A:** All Companies - 566 company year observations (129 different firms)

| | Mean | Median | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| MTB | 2.30 | 1.70 | 2.06 | 0.00 | 15.99 |
| ROA (in %) (*) | 13.71 | 11.25 | 11.72 | -25.46 | 87.15 |
| Debt Ratio | 0.26 | 0.18 | 0.23 | 0.00 | 0.94 |
| Age | 28.75 | 24.00 | 19.09 | 1.00 | 81.00 |
| Size | 15.43 | 15.33 | 0.95 | 13.73 | 18.74 |

* For ROA there are only 562 company-year observations

**Panel B:** Affiliated Companies - 222 company year observations (48 different firms)

| | | | | | |
|---|---|---|---|---|---|
| MTB | 2.92*** | 2.39 | 2.50 | 0.15 | 15.99 |
| ROA (in %) | 14.41 | 12.40 | 10.35 | -0.08 | 53.77 |
| Debt Ratio | 0.29*** | 0.22 | 0.24 | 0.01 | 0.90 |
| Age | 35.40*** | 31.50 | 17.90 | 1.00 | 74.00 |
| Size | 15.71*** | 15.73 | 0.83 | 13.73 | 17.85 |

**Panel C:** Stand-alone companies - 344 company-year observations (81 different firms)

| | | | | | |
|---|---|---|---|---|---|
| MTB | 1.90 | 1.48 | 1.60 | 0.00 | 12.49 |
| ROA (in %) | 13.27 | 10.17 | 12.51 | -25.46 | 87.15 |
| Debt Ratio | 0.24 | 0.16 | 0.22 | 0.00 | 0.94 |
| Age | 24.46 | 19.00 | 18.62 | 1.00 | 81.00 |
| Size | 15.26 | 15.13 | 0.98 | 13.81 | 18.74 |

## Table IV

### Universal Bank Affiliation and Value Creation: Market-to-Book Ratio

The table displays regression coefficients and p-values for random effects regressions (clustered white standard errors were used). The dependent variable is the market to book ratio of equity, defined as the previous year-end market value of equity divided by the book value of equity at the beginning of the year. A company is considered to be affiliated with a universal bank if an executive board member of a universal bank is also on the executive board on the company. "Interlock yes/no" is a dummy variable indicating if a company is interlocked with a universal bank. "No. of interlocks" is the number of interlocks a company has with the universal banks. Equity stake is defined as the number of shares held by the banks divided by the total number of shares traded on the Brussels stock exchange. Debt ratio is defined as the book value of total debt at the beginning of the fiscal year divided by total assets at the beginning of the fiscal year. size is the natural logarithm of total assets at the beginning of the fiscal year and age is the difference between the current year and the year the company transformed to a limited liability company. ***, ** and * indicate significance at the 1%, 5% and 10% significance level respectively.

| Dependent Variable: MTB | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Interlock: Yes/No | 0.802** | | | -0.159 | |
| | (0.024) | | | (0.760) | |
| No. of Interlocks | | 0.465*** | | 0.521** | 0.518*** |
| | | (0.002) | | (0.014) | (0.002) |
| Equity Stake | | | 2.010 | | -1.069 |
| | | | (0.117) | | (0.436) |
| Debt Ratio | 2.288*** | 2.284*** | 2.245*** | 2.280*** | 2.290*** |
| | (0.003) | (0.002) | (0.003) | (0.003) | (0.002) |
| Age | 0.038*** | 0.034*** | 0.043*** | 0.034*** | 0.034*** |
| | (0.001) | (0.003) | (0.001) | (0.003) | (0.003) |
| Size | -0.881** | -0.906** | -0.847** | -0.909** | -0.915** |
| | (0.029) | (0.022) | (0.036) | (0.022) | (0.022) |
| Industry Effects | Included | Included | Included | Included | Included |
| Year Fixed Effects | Included | Included | Included | Included | Included |
| Overall $R^2$ | 0.265 | 0.289 | 0.247 | 0.289 | 0.290 |
| No. of observations | 566 | 566 | 566 | 566 | 566 |

## Table V

### Universal Bank Affiliation and Value Creation: Return-On-Assets

The table displays regression coefficients and p-values for random effects regressions (clustered white standard errors were used). The dependent variable is return-on-assets (ROA), defined as sales minus direct production costs, indirect production costs (e.g. overhaul, electricity, etc.) and salaries, divided by the book value of total assets at the beginning of the fiscal year. A company is considered to be affiliated with a universal bank if an executive board member of a universal bank is also on the executive board on the company. "Interlock yes/no" is a dummy variable indicating if a company is interlocked with a universal bank. "No. of interlocks" is the number of interlocks a company has with the universal banks. "Equity stake" is defined as the number of shares held by the banks divided by the total number of shares traded on the Brussels stock exchange. "Debt ratio" is defined as the book value of total debt at the beginning of the fiscal year divided by total assets at the beginning of the fiscal year. "Size" is the natural logarithm of total assets at the beginning of the fiscal year and age is the difference between the current year and the year the company transformed to a limited liability company. ***, ** and * indicate significance at the 1%, 5% and 10% significance level respectively.

| Dependent Variable: ROA | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|
| Interlock: Yes/No | 2.089 | | | -2.083 | |
| | (0.239) | | | (0.423) | |
| No. of Interlocks | | 1.548** | | 2.274** | 1.680* |
| | | (0.044) | | (0.045) | (0.060) |
| Equity Stake | | | 8.268 | | -2.662 |
| | | | (0.348) | | (0.782) |
| Debt Ratio | -9.079** | -9.051** | -9.209** | -9.174** | -9.076** |
| | (0.037) | (0.033) | (0.034) | (0.031) | (0.033) |
| Age | 0.098 | 0.081 | 0.107* | 0.083 | 0.081 |
| | (0.145) | (0.223) | (0.100) | (0.216) | (0.222) |
| Size | -2.495 | -2.647* | -2.379 | -2.674* | -2.680* |
| | (0.110) | (0.085) | (0.131) | (0.082) | (0.084) |
| Industry Effects | Included | Included | Included | Included | Included |
| Year Fixed Effects | Included | Included | Included | Included | Included |
| Overall $R^2$ | 0.181 | 0.192 | 0.180 | 0.194 | 0.192 |
| No. of observations | 562 | 562 | 562 | 562 | 562 |

## Table VI

### Universal Bank Affiliation: Number of interlocked banks vs. number of bank interlocks

The table displays regression coefficients and p-values for random effects regressions (clustered white standard errors were used). The dependent variables are market to book ratio of equity (MTB), defined as the previous year-end market value of equity divided by the book value of equity at the beginning of the year, and return-on-assets (ROA), defined as sales minus direct production costs, indirect production costs (e.g. overhaul, electricity, etc.) and salaries, divided by the book value of total assets at the beginning of the fiscal year. "No. of interlocked banks" is a count variable indicating with how many banks there is an interlock. 'No. of interlocks-No. of interlocked banks" is the difference between the number of interlocks and the number of interlocked banks. "Debt ratio" is defined as the book value of total debt at the beginning of the fiscal year divided by total assets at the beginning of the fiscal year. "Size" is the natural logarithm of total assets at the beginning of the fiscal year and age is the difference between the current year and the year the company transformed to a limited liability company. ***, ** and * indicate significance at the 1%, 5% and 10% significance level respectively.

| Dependent Variable: | MTB | ROA |
|---|---|---|
| | (11) | (12) |
| No of interlocked banks | 0.534* | 0.391 |
| | (0.076) | (0.743) |
| No. of Interlocks - No.of interlocked banks | 0.379 | 3.004** |
| | (0.185) | (0.036) |
| Debt Ratio | 2.284*** | -9.068** |
| | (0.003) | (0.032) |
| Age | 0.034*** | 0.083 |
| | (0.002) | (0.212) |
| Size | -0.911** | -2.613* |
| | (0.023) | (0.088) |
| Industry Effects | Included | Included |
| Year Fixed Effects | Included | Included |
| Adjusted $R^2$ | 0.288 | 0.198 |
| No. of observations | 566 | 562 |

## Table VII

### Universal Bank Affiliation and Risk: Standard Deviation of ROA

The table displays weighted regression coefficients and p-values. The number of observations per company is used as weight. The dependent variable is the standard deviation of return-on-assets (ROA). ROA is defined as sales minus direct production costs, indirect production costs (e.g. overhaul, electricity, etc.) and salaries, divided by the book value of total assets at the beginning of the fiscal year. A company is considered to be affiliated with a universal bank if an executive board member of a universal bank is also on the executive board on the company. "Interlock yes/no" is a dummy variable indicating if a company is interlocked with a universal bank. "No. of interlocks" is the number of interlocks a company has with the universal banks. "Debt ratio" is defined as the book value of total debt at the beginning of the fiscal year divided by total assets at the beginning of the fiscal year. "Size" is the natural logarithm of total assets at the beginning of the fiscal year and age is the difference between the current year and the year the company transformed into a limited liability company. Averages are calculated over the period 1905-1909. Heteroscedasticity consistent standard errors were used to compute p-values. *, ** and *** indicate significance at the 10%, 5% and 1% significance level respectively.

| Dependent Variable: Standard Deviation of ROA | (13) | (14) | (15) |
|---|---|---|---|
| Interlock: Yes/No | -1.463** | | -0.392 |
| | (0.011) | | (0.685) |
| No. of Interlocks | | -0.752*** | -0.607 |
| | | (0.003) | (0.158) |
| Average ROA | 22.758*** | 23.352*** | 23.267*** |
| | (0.000) | (0.000) | (0.000) |
| Average Debt Ratio | 3.238** | 3.188** | 3.191** |
| | (0.026) | (0.033) | (0.032) |
| Average Age | 0.039** | 0.043** | 0.043** |
| | (0.045) | (0.032) | (0.034) |
| Average Size | -0.984*** | -0.890*** | -0.898*** |
| | (0.002) | (0.004) | (0.003) |
| Industry Effects | Included | Included | Included |
| Average s.e. of ROA | 4.411 | 4.411 | 4.411 |
| adjusted $R^2$ | 0.547 | 0.555 | 0.561 |
| # Observations | 128 | 128 | 128 |

## Table VIII

## Portfolio Risk and Return

The table displays the Sharpe ratios and Jobson Korkie test statistic for equally weighted and value weighted portfolios of affiliated companies and corresponding control companies. A company is defined to be affiliated if an executive board member of a universal bank is also on the executive board of that company. The control companies are sector and size (book value of total assets) matched companies. The risk free rate is the discount rate used by the Belgian National Bank on domestic government bonds. (Prêts et avances en compte courant sur Fonds Publics Nationaux, Source: SCOB). Two tailed p-values are given in parentheses.

**Panel A:** Equally weighted portfolios

| | Affiliated companies | Control companies |
|---|---|---|
| Mean Monthly Excess Return | 0.93% | 0.52% |
| Standard Deviation Monthly Excess Return | 2.63% | 2.85% |
| Sharpe Ratio | 0.35 | 0.18 |
| Jobson Korkie | 2.090** | |
| | (0.018) | |

**Panel B:** Value weighted portfolios

| | Affiliated companies | Control companies |
|---|---|---|
| Mean Monthly Excess Return | 0.70% | 0.55% |
| Standard Deviation Monthly Excess Return | 2.53% | 2.83% |
| Sharpe Ratio | 0.28 | 0.19 |
| Jobson Korkie | 1.164 | |
| | (0.122) | |