Universal Banks and Firm Debt Structure

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Abstract

In the recent decades U.S. firms increasingly finance themselves with bonds instead of bank loans, a development with important macroeconomic implications. What causes this change in corporate debt composition? This paper finds that bank scope expansion significantly contributes to the development. Universal banking that combines lending and underwriting reduces informational frictions in the bond underwriting process. The effects are identified by exploiting a regulatory reform in context of the repeal of the Glass-Steagall Act that materially improves banks' effectiveness in underwriting their borrowers' securities. Affected firms increase their quarterly bond issuance by around 5 percent while reducing their bank loan uptake by around 3 percent. This substitution behavior is driven by lower underwriting fees and bond spreads, and is, consistent with theoretical predictions, stronger for more informationally-sensitive firms. The higher effectiveness of bond underwriting and the associated shift in the corporate debt structure results in increased firm investment, sales growth, and profitability.

JEL classification: G20, G21, G24, G28

Keywords: universal banks, financial deregulation, Glass-Steagall, corporate bond market, disintermediation, debt structure

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1 Introduction

Firms in the U.S. are increasingly financed by bond debt instead of bank loans. Figure 1 shows that bond debt as share of total corporate debt outstanding has expanded from less than 50 percent in the period before 1990 to almost 70 percent in recent years.[1]

[Figure 1 here]

This shift in firm finance has important macroeconomic consequences as firms with access to bond markets may have available a "spare-tire" of external finance during a financial crisis (Adrian et al., 2013; De Fiore and Uhlig, 2015) and across the business cycle (Becker and Ivashina, 2014). At the same time, bank debt is easier to restructure than market debt in the event of financial distress so the shift could also expose the corporate sector to a higher liquidation risk (Bolton and Scharfstein, 1996; Crouzet, 2018). Moreover, the composition of corporate debt influences the transmission channels of monetary policy to the real economy (Kashyap et al., 1993; Bolton and Freixas, 2006)[2]. Despite its importance, however, the causes of this economic development are not well-understood: the extant literature suggests that a decrease in loan supply can push firms to the bond market (Becker and Ivashina, 2018); further factors that may facilitate the substitution of bonds for bank loans are improvements in bankruptcy procedures (Becker and Josephson, 2016) as well as unconventional monetary policy (Grosse-Rueschkamp et al., 2019; Giambona et al., 2020). None of these factors offers a compelling explanation for the disintermediation of the U.S. economy that started in the 1990s.

This paper sheds light on this important question. It brings forward and provides evidence for the hypothesis that the rise of universal banking conglomerates that offer both lending and underwriting services significantly contributes to the development. Even though bond markets are often considered a relatively frictionless source of external finance there is an important role for underwriters to certify the quality of a bond to investors. Theoretical mechanisms explain how private information from a lending relationship can increase the underwriter's certification abilities

[1] Figure 1 uses aggregate data from the Flow of Funds accounts to plot bond debt as share of total debt outstanding in the non-financial corporate sector. The bond share is roughly constant for a number of decades until around 1990 it experiences a strong and lasting rise. Crouzet (2021) compares several further sources of data and reports evidence consistent with the Flow of Funds data, that is, a persistent trend of disintermediation of credit in the U.S. economy.

[2] Recent work includes Ippolito et al. (2018), Darmouni et al. (2020), and Crouzet (2021).

(Puri, 1999)[3] and lower its underwriting costs due to informational economies of scope (Kanatas and Qi, 2003). Thus, by increasing the effectiveness of the underwriting process, universal bank underwriting makes direct finance 'more direct', especially for informationally-sensitive issuers. Reducing informational frictions in bond underwriting improves the pricing and increases the supply of bond debt relative to bank loans, inducing firms to shift some of their demand for external finance to the bond market.

This hypothesis is tested empirically in context of the repeal of the Glass-Steagall Act, and evidence is presented that the rise of universal banking facilitates firms' shift from bank loan to bond financing. The Glass-Steagall Act of 1933 allowed only investment banks but not commercial banks to underwrite corporate securities such as equities and bonds. These provisions were repealed in several steps from the late 1980s onwards. The deregulation allowed for the formation of universal banks that combine commercial and investment banking business. Descriptive evidence shows that universal bank underwriters rapidly gained market share in corporate bond underwriting while at the same time underwriting spreads declined permanently.

The empirical approach of the main analyses exploits a particular deregulation in 1996 that abolished requirements on informational firewalls that had restricted information sharing between a universal bank's lending and underwriting division. The deregulation increased the *de facto* scope of some banks while leaving other banks unaffected. The identification strategy thus exploits the fact that it is very costly and rare for firms to switch their relationship bank[4]. It also builds on the assumption that the primary beneficiaries of expansion of bank scope are firms with an existing lending relationship to an universal bank[5]. Using the 1996 deregulation as shock to the effective scope of universal banks, debt issuance of firms in lending relationships with universal banks ("treatment group") are compared to firms in relationships to banks whose scope was unaffected by the deregulation ("control group") in a difference-in-differences analysis. As the *ex-post* choice of a firm's underwriter is potentially affected by the deregulation itself, the treatment group definition

[3] A bank underwriting its borrowers' securities may face a conflict of interest in that it may have an incentive to overstate the value of the securities and require the borrower to use the proceeds to repay its loan (Puri, 1996). However, prior empirical studies examining securities issuance generally find evidence consistent with a net certification effect, i.e. the positive effects of improved certification dominating any potentially negative effects of the conflict of interest: Puri (1996), Gande et al. (1997) and Yasuda (2005), among others, focus on corporate bond issuance, and Schenone (2004) and Duarte-Silva (2010) focus on equity initial public offerings (IPOs) and seasoned equity offerings (SEOs), respectively. Their findings imply a net certification effect by banks underwriting their borrowers' securities.

[4] The reasons for "sticky" bank relationships include a reduction in screening or monitoring costs for repeat borrowers and adverse selection for borrowers that are switching their bank. See e.g. Srinivasan (2014) for a survey of the literature on bank-lending relationships.

[5] Empirical evidence is provided by Gande et al. (1997), Schenone (2004), Yasuda (2005), and others.

is based on the *ex-ante* potential for underwriting benefits, which is captured by the relationship bank type ("intention-to-treat approach"). Lending relationships are not randomly assigned[6] so the analysis meticulously accounts for potential differences between control and treatment group firms that could also affect the outcome. In particular, the analyses use firm-level control variables to control for time-varying firm characteristics, while time-invariant unobservable firm characteristics are absorbed through firm fixed effects. An extensive range of fixed effects accounts for time-varying unobservable shocks at the state and industry level. The results also withstand the inclusion of highly restrictive quarter-state-industry fixed effects. In addition, parametric tests confirm the parallel trend assumption. The results suggest that conditional on controls, debt issuance between treatment and control group firms did not differ systematically in the pre-deregulation period.

As first result, firms can issue their bonds after the deregulation with yield spreads of around 30 basis points more cheaply. In addition, they pay 15 basis points less in underwriting fees. This is an economically large reduction and suggests that the deregulation improves firms' access to bonds. Consistent with theories of underwriter certification that emphasize the role information assymetries, the yield spread improvements are especially large for informationally-sensitive firms, i.e. high yield-rated firms as well as firms that issue a bond for the first time. Next, the main outcome variables of interest, bond and loan issuance volumes, are analyzed. The main result of this paper is that firms *increase* their quarterly bond issuance by around 5 percent. At the same time, they *decrease* their quarterly bank term loan issuance by around 3 percent. These changes are economically large and statistically significant and withstand a battery of robustness checks. Further analyses that employ the substitution indicator by Becker and Ivashina (2014) reveal that firms with a high yield credit rating react particularly strongly. The deregulation has not just an effect on the within-firm bond share but affects also the extensive margin: the number of first-time bond issuers climbs significantly. The results strongly support the hypothesis that reducing informational underwriting frictions increases the supply of bond debt.

Cross-selling of loans and securities may increase universal banks' ability to monitor borrowers (Neuhann and Saidi, 2018). This implies that an expansion of bank scope may enable banks to reduce their loan pricing and increase loan supply, alongside improved bond underwriting. Thus, further analyses are carried out. First, loan spreads are examined. The results show that treatment group firms are able to borrow more cheaply than control group firms. In a second step, a bank-

[6] Self-selection into treatment is unlikely to be an issue, as market participants did not anticipate the deregulation. The United States House Committee on Financial Services had rejected a proposal to eliminate informational firewalls in 1991, and the deregulation was announced by the Federal Reserve Board without prior public debate.

firm-year panel is constructed. Exploiting the fact that some firms are connected to more than one bank, firm-time fixed effects (Khwaja and Mian, 2008) are used to absorb firms' loan demand. The results indicate that universal banks increase their loan supply relative to lenders not affected by the deregulation. The results are stronger for a subsample of capital-constrained banks, consistent with the hypothesis that the decrease in loan demand relaxes universal bank's lending constraints, as in Grosse-Rueschkamp et al. (2019). These results also help to rule out a story of reverse causality that might explain the main results as a consequence of a decrease in loan supply[7]. Rather, the findings support the hypothesis of an increase in bond supply due to reduced underwriting frictions which firms take advantage of to substitute away from bank loans.

How does the shift in corporate debt composition affect real firm outcomes? Analyses show that reducing frictions on the primary bond market is associated with an increase in firm investment and profitability, as well as sales and employment growth on the firm-level. The analyses in this paper thus also informs the ongoing policy debate on the merits of a universal banking system[8].

This paper proceeds as follows. First, the related literature and the contribution of this study is discussed. The following section describes the institutional background and the data, and subsequently the methodology and identification strategy are laid out. The section thereafter presents and discusses the results. Concluding remarks are provided in the final section.

2 Related literature

This paper relates to several strands of literature. Firstly, the paper contributes to the literature on corporate debt structure, in particular on the firm choice between bank loans and bond debt. There is a long-standing theoretical literature analyzing firms' choice between bonds and bank debt (e.g., Diamond, 1991; Rajan, 1992; Bolton and Scharfstein, 1996; Holmstrom and Tirole, 1997). The empirical literature include Denis and Mihov (2003) and Rauh and Sufi (2010) and Colla et al. (2013), among others. These studies generally focus on firm-level characteristics as explanations for debt choices. In contrast, Houston and James (1996) find that the number of bank-relationships influences a firm's debt choice, and Schwert (2020) finds that firms matched to low-capitalized banks are more likely to rely on bonds. This paper adds to that literature by being first to provide

[7] The Russia/LTCM Crisis in the second half of 1998 may be a concern in this setting.

[8] Glass-Steagall remains popular among the American electorate and political voices have in recent years proposed a re-introduction. Notably, U.S. President Joseph R. Biden stated that the major regret of his career was his vote to repeal Glass-Steagall (CNN, 11 December 2016, https://www.youtube.com/watch?v=heXAQvYz-e0). While the economics of universal banking have been studied, its impact on real firm-level outcomes are under-researched.

evidence that the *scope* of the relationship bank has an influence on the firm choice of bank versus bond debt.

This study relates to the literature studying the broader shift in corporate finance from bank loans to bond debt and its impact on bank balance sheets. Crouzet (2021) investigates multiple data sources and shows that corporate debt in the U.S. economy has increasingly become disintermediated, a phenomenon that occured on the firm-level and does not reflect a reallocation of credit away from private firms. This paper finds that the expansion of bank scope from the deregulation of the Glass-Steagall Act that occured around the same time the bond share started to increase significantly contributed to the development. Darmouni and Papoutsi (2020) document an increase in the bond share for European firms since the Financial Crisis. Balloch (2018) finds that a bond market deregulation in Japan leads to a substitution from bank to bond debt. The resulting decrease in loan demand gave rise to a positive bank funding shock which increased bank lending to other firms. Grosse-Rueschkamp et al. (2019) find comparable results in the context of the European Central Bank's corporate bond purchases. This study contributes to that literature by providing similar evidence for the U.S. economy in context of the deregulation of the Glass-Steagall Act.

Additionally, this paper relates to the literature studying the scope of bank business activities, in particular the effects of bank lending relationships on securities' underwriting. Gande et al. (1997) find that a lending relationship reduces yield spreads of bonds underwritten by universal banks. Schenone (2004) examines the effect of bank relationships on IPO underpricing, while Duarte-Silva (2010) considers SEOs. Consistent with a net certification effect they find reduced underpricing for securities underwritten by the relationship bank. Akiyoshi (2019) shows that a break-up of a universal bank into its commercial and investment banking unit hurts client firms' market value.

A different strand of the literature on bank scope examines the effects of cross-selling loans and underwriting services on bank lending. Neuhann and Saidi (2018) find that informational economies of scope enhance bank monitoring abilities which enable universal banks to extend loans to riskier borrowers. The same authors also link improved universal bank monitoring to the rise of institutional lending (Neuhann and Saidi, 2016). Results in Colonnello (2020) suggests that universal banks focus their loan supply on larger firms, while Qi (2020) finds that banks' cross-selling of loan and non-loan products increases bank loan supply.

A third strand of the bank scope literature focuses on how a lending relationship impacts the

competition for underwriting mandates. Yasuda (2005) finds that lending relationships have a positive influence on the choice of underwriter over and above the fee discount firms receive from underwriters that lent to them. Drucker and Puri (2005) find that firms who issue bonds and loans concurrently receive discounted loan spreads and underwriting fees. Ljungqvist et al. (2006) and Bharath et al. (2007) show that banks who lend to firms are more likely to be chosen as underwriters. Gande et al. (1999) find a pro-competitive effect of commercial banks' entry into the bond underwriting market.

To summarize, the empirical literature on bank scope documents mostly advantages in different dimensions to firms with a lending relationships to their underwriters. These can result from enhanced certification as modeled by Puri (1999). While a theoretical possibility, empirical results do not seem to favor the conflict of interest hypothesis (Kroszner and Rajan, 1994; Puri, 1996). Another mechanism are informational economies of scope as modeled in Kanatas and Qi (2003) or Laux and Walz (2009).

This study builds on the existing empricial literature on banks scope but goes beyond the price or competition effects documented there and examines *quantity*. Since Stiglitz and Weiss (1981) it is well-known that credit markets may ration borrowers so whether firms increase borrowing when issuance costs of a debt type falls may not be obvious. This may especially be the case as an expansion in bank scope may also influence bank loan supply. Universal banks may increase their loan supply in order to gain future underwriting business, or because of lending advantages related to their enhanced monitoring abilities. The results in this study document an increase in bond issuance while firms decrease their loan issuance. To the best of my knowledge, this is the first study considering the quantity effects of securities' issuance from the scope of bank business activities.

3 Setting and Methodology

3.1 Institutional Background

Enacted during the Great Depression, the Glass-Steagall Act[9] proscribed the separation of commercial banking from investment banking activities. Deposit-taking commercial banks were prohibited from underwriting and dealing in securities. In April 1987 the Federal Reserve Board adopted

[9] More accurately, the Banking Act of 1933. Following widespread terminology, this paper refers to the sections of the Banking Act that concern banks' securities operations (sections 16, 20, 21, 32) as "Glass-Steagall Act".

increasingly broader interpretations. Constituting a first wave of deregulation, from 1987 onwards commercial banks were allowed to operate so-called "section 20 subsidiaries" that allowed banks to underwrite certain eligible securities, such as municipal revenue bonds and mortgage-related securities. Commercial banks were first allowed to underwrite corporate debt and equity in 1989. A revenue limit of 5 percent as share of total underwriting revenue was mandated, and was raised to 10 percent in September of 1989. Although at this point universal banking was possible, its effective scope was still severely limited: among other restrictions, informational firewalls prevented the exchange of information between the business areas. After a number of years of deregulatory inactivity, on 1 August 1996, the Federal Reserve Board proposed the elimination of some of the informational and financial firewalls, as well as raising the revenue limit from 10% to 25%. The changes were implemented in the months after the announcement, altogether constituting the 1996-1997 deregulatory episode. The final deregulatory push came with the passing of the 1999 Gramm-Leach-Bliley Act which effectively abolished most remaining limits to commercial banks' expansion into securities and insurance business.

3.2 Identification and Methodology

At the core of the identification strategy is the deregulation event announced in August 1996. The deregulation removes firewalls that severely limits the financial, organizational and informational linkages between universal banks and their investment banking subsidiaries. It thereby enabled universal banks to employ their potentially superior certification abilities when underwriting their borrowers' securities. The hypothesis in this paper is that this reduced underwriting frictions and consequently securities are issued at lower yields and the issuers are charged lower underwriting fees. Reduced frictions make issuing bond debt more attractive relative to bank debt.

To empirically evaluate this effect, a difference-in-difference framework is employed. The treatment group consists of firms with a lending relationship to a universal bank *before* the announcement. The control group consists of firms with a lending relationship to other commercial banks whose scope was not affected by the deregulation. A lender[10] is defined as universal bank if it operated a section 20 subsidiary by the time the deregulation was announced[11]. An indicator variable $UB\ Relationship_i$ equals one for treatment group firms, and zero for control group firms. Both the formation of new bank relationships after the deregulation as well as the choice of under-

[10] The sample includes insurance companies that own an investment bank and lend in the syndicated loan market.

[11] I would like to thank Daniel Neuhann and Farzad Saidi for making their data on section 20 subsidiaries and mergers between commercial and investment banks available to me.

writer is potentially endogenous[12]. Therefore, treatment is not defined by either a firm's choice of underwriter nor by the type of bank relationship at the time of the securities' offering. Defining the treatment by the *ex-ante* underwriting benefits captured by the bank relationship type corresponds an "intention-to-treat" (ITT) approach. The highest granularity of the firm data available is quarterly, so an indicator variable $Post_t$ equals 1 for Q4-1996 and after, and 0 before. A six-year sample period from 1994-1999 is used, however, the results also hold at different time windows[13]. Following the literature (e.g. Bharath et al., 2007), bank-firm pair has a lending relationship if a loan was originated in any of the 5 years prior to the deregulation. Only lead arrangers are considered as there is substantial evidence that they manage the relationship and conduct most of the information production, i.e. screening and monitoring of the borrower (Sufi, 2007; Ivashina, 2009).

To be able to interpret the estimated effects as causal, a number of conditions need to be satisfied. As first condition, there is no self-selection into treatment, i.e. firms cannot have anticipated the deregulation. The deregulation was announced after several years of regulatory inactivity by the Federal Reserve Board and was not prefaced by congressional or public debate[14]. Furthermore, in 1991 the United States House Committee on Financial services had rejected a proposal by the financial services industry to eliminate informational firewalls. This supports the assumption that the 1996 deregulatory action by the Federal Reserve Board had not been anticipated by market participants. Moreover, firms must not be able to simply switch their lending relationships. As the extant literature has found, lending relationships between banks and firms are persistent and switching lenders is rare (see Srinivasan, 2014).

A second condition for a causal interpretation is that the control group provides a good counterfactual to the treatment group. That is, had the deregulation not happened, the composition of loans and bonds issued would have evolved similarly for control and treatment firms. The following steps are taken to rule out as much as possible that the effects are driven by factors unrelated to the deregulation: (1) Controlling for observable time-varying firm characteristics[15], (2) controlling for unobserved firm heterogeneity using firm fixed effects, i.e. estimating the within-firm effect to

[12] Using a theoretical framework, Schenone (2004) argues the ability of the relationship bank to underwrite securities is sufficient to reveal the firm's type, independently of whether it actually does the underwriting. Empirical evidence is provided in the same paper.

[13] Robustness checks are provided in the Internet Appendix.

[14] The Wall Street Journal on 1 August 1996 "For years, bitter disagreements between these [i.e. banking and securities] industries and between the two major political parties have scuttled efforts to dismantle Depression-era legal barriers between banks and securities firms." The article is presented in the Internet Appendix.

[15] Banks with a section 20 subsidiary are often larger banks, so borrowers from these banks also tend to be larger firms.

ensure that no change in firm composition drives the results, and (3) controlling for unobservable shocks at the industry-time level. This accounts for time-varying investment opportunities or other trends at the industry-level that may drive the results if certain industries are over-represented in the treatment relative to the control group. The analysis also controls for (4) unobservable shocks at the state-time level, which accounts for potential effects of the intra-state bank deregulation that occurred around the same time period as well as any other location-time specific shock. (5) Finally, to ensure that the regression analysis does not pick up pre-existing trends of debt issuance composition between control and treatment firms, the parallel trend assumption is confirmed parametrically.

To analyze the effect of the deregulation allowing the expansion of bank scope, the main analyses on debt issuance estimates the following regression equation:

$$Debt\ Issuance_{it} = \beta\ UB\ Relationship_i \times Post_t + X_{it-1} + \gamma_{st} + \lambda_{jt} + \mu_i + \epsilon_{it}$$

where $UB\ Relationship_i$ and $Post_t$ are indicator variables as defined above and the variable of interest, $UB\ Relationship_i \times Post_t$, is their interaction term. X_{it-1} is a one period-lagged vector of time-varying firm-level controls (size, profitability, tangibility, leverage and market-to-book ratio); γ_{st} are state-quarter fixed effects; λ_{jt} are industry-quarter fixed effects measured on a three-digit SIC code-level; and μ_i are firm fixed effects. Specifications that include highly restrictive quarter-state-industry fixed effects are also estimated.

To better understand the potential impact of the reform on bank balance sheets and to rule out a reverse-causality story, bank loan supply is also analyzed. Using loan-level information from Dealscan, a bank-firm-year panel is constructed. The pre-deregulation period is comprised of loans issued from 1994-1996, the post-deregulation period is comprised of loans from 1997-1999[16]. Exploiting the fact that some firms have relationships with multiple banks, a within-firm estimator is used to disentangle loan demand from loan supply (Khwaja and Mian, 2008). That is, the following linear probability model is estimated:

$$pr(Loan)_{ibt} = \beta\ UB_b \times Post_t + \phi_{it} + \psi_{bi} + \epsilon_{ibt}$$

where $pr(Loan)_{ibt}$ is the probability that firm i receives a loan from bank b (as lead arranger) in period t; ϕ_{it} are firm-year fixed effects, and ψ_{bi} are firm-bank fixed effects.

[16] The analysis is conducted on a bank-firm-year panel, i.e. on an annual level. To be consistent with the pre-/post definition in the main analysis loans originated in Q4-1996 are assigned to 1997, i.e. the post-deregulation period. The total number of loans in 1996 and 1997 are then weighed appropriately to account for the adjustment.

4 Data

4.1 Compustat-SDC-Dealscan sample

Quarterly and annual firm accounting data for public firms in the U.S. is obtained from Compustat. The data set is supplemented with DealScan data (Thomson Reuters LPC's database) on syndicated loans, as well as bond issuance data from SDC's Global New Issuances Database. Loans are matched to firms using the Chava and Roberts (2008) link file. Bonds are matched to Compustat through issuer cusips. To increase the number and quality of matches, the Snapshot file from Compustat is used which contains information on historical 6-digit issuer cusips and links them to Compustat firm identifiers[17]. Variables are winsorized a the 1st and 99th percentile. Financial firms (SIC codes 6000-6999) are dropped. Bonds are required to have non-missing information on issuance date, issuance amount and maturity date. Likewise, loans are included if they have non-missing information on issuance date, issuance amount, maturity date and loan spread[18]. The main variable of interest is $UB\ Relationship_i$, an indicator variable that takes the value of one if a firm has received a loan from a universal bank in any of the five years prior to the deregulation. A bank is defined to be a universal bank if it operates a section 20 subsidiary *before* the announcement of the deregulation. A list of universal banks is provided in the appendix.

4.2 Dealscan sample

To estimate the effect of the deregulation on bank loan supply, a bank-firm-loan panel is constructed using loan data from DealScan. Bank subsidiaries are aggregated under the ultimate parent using the link table provided in Schwert (2020), and data on banks is obtained from Bank Compustat. The sample is restricted to term loans. The focus is on lead arrangers[19]. Bank-loan pairs with zero loan issuance data in both, pre- and post-period are excluded and data is aggregated on an annual level to arrive at a bank-firm-year panel. To account for the fact that the post-period starts in Q4-1996, loans originated in Q4-1996 are attributed to the year 1997 and the total amount in 1996 and 1997 are weighted appropriately.

[17] Cusips in Compustat are header information (i.e. only the latest information is available). Using header information may lose bond-firm links for firms that changed their cusip designation since the sample period.

[18] Loans with missing loan spreads are dropped as missing spreads are indicative of loan contract amendments rather than new issuances.

[19] The loan amount is split equally among lead arrangers when there are multiple lead arrangers in a loan facility as the coverage of lender shares is limited.

4.3 Descriptive statistics

[Table 1 here]

Table 1 reports the summary statistics over the period before the announcement. In general, firms with a universal bank relationship tend to be larger, more highly levered, and more frequent debt issuers. Firms with a relationship to a commercial bank are on average more profitable and have higher market-to-book ratios. Concerns that observable and unobservable differences between treatment and control firms may affect the results are addressed in the methodology section. Also reported are the summary statistics of the bond panel as well as the bank-loan panel. All variables are defined in the Appendix.

5 Empirical Results

5.1 Trends in Corporate Bond Underwriting

This section provides descriptive evidence on the time series of the trends of the bond share in the U.S. economy, the market share of universal bank underwriters and the bond underwriting spread. These trends are correlated to the deregulation of the Glass-Steagall Act that occured during the time period between 1987 and 1999. Underwriting affiliates of commercial banks ("section 20 subsidiaries") were approved in 1987, and first corporate bond underwriting powers were extended to theses entities in 1989. In a second major deregulatory episode in 1996-1997, existing underwriting revenue limits were lifted substantially and informational firewalls between section 20 subsidiares and their parents largely eliminated. Finally, in November 1999, Glass Steagall was abolished altogether.

[Figure 1 here]

Figure 1 uses aggregate data from the Flow of Funds accounts to plot bond debt as share of total debt outstanding in the non-financial corporate sector during past five decades. The bond share is roughly constant for a number of decades. Around 1990, however, it experiences a strong and lasting rise. It decreases somewhat in the years before the financial crisis of 2008, but rises even higher thereafter. Crouzet (2021) compares several further sources of data and reports evidence consistent with the Flow of Funds data, that is, a persistent trend of disintermediation of credit in the U.S. economy.

[Figure 2 and 3 here]

What are the underlying causes for this process of disintermediation? Figures 2 and 3 present evidence suggesting a role of bank scope deregulation in the disintermediation process. Figure 2 plots the market share of universal bank underwriters. The market share is zero before 1989 and increases rapidly in the following decade. The series ends in 2004 after which the the presence of formerly pure-play investment banks in the syndicated loan market increasingly blurs the distinction between universal banks and investment banks. Figure 3 plots the underwriting spread in basis points for issues of non-financial corporate bonds into the public U.S. market. The spread is plotted separately for bonds with a high investment grade credit rating (A- and above on the S&P scale), bonds with a low investment grade rating (BBB), as well as high yield bond issues (BB+ and below). Especially the latter experience a spectacular drop over time[20]. This evidence is consistent with universal bank underwriters increasing competition in the market for underwriting services. It is also consistent with theories that describe informational economies of scope by universal bank underwriters (Kanatas and Qi, 2003). In a competitive market these cost-advantages would be passed on to customers, at least partially. Importantly, underwriting spreads are not the only (or even most important) cost component of bond underwriting. Yield spreads are a much larger share of the total cost of bond debt, and are also likely to drop as result of the formation of universal bank underwriters[21].

[Table 2 here]

To more formally analyze the decline in underwriting spreads the analyses in table 2 regress bond underwriting spreads on time dummies while controlling for a number of bond characteristics, including credit rating and industry of the bond issuer. The time periods correspond to changes in regulatory regimes with regard to the regulation of bank scope, similarly to Kim et al. (2008). The time period omitted in the regression is Q1-1980 to Q4-1988, i.e. before the onset of the banking deregulation.

The results provide evidence that especially for lower-rated bond issuers there was a lasting decline in underwriting fees, potentially making bond issuance more attractive. Was the improvement in underwriting conditions a result of the Glass-Steagall deregulation, and did this lead to an

[20] This paper is not the first to note a decline in underwriting spreads: Gande et al. (1999) and Kim et al. (2008) find a decline in spreads coinciding with the market entry of universal bank underwriters which they suggest is due to increased competition in the underwriting market. Livingston and Williams (2007) attribute the (initial) decline to the bankruptcy of the investment bank Drexel Burnham Lambert in 1990.

[21] Yield spreads are strongly responsive to monetary policy and macroeconomic factors so they are not amenable to descriptive time series analysis in this context. The main analysis, however, does consider yield spreads.

increase in the share of bond debt issued? Using a specific deregulatory episode as a clean setting, this question is examined in the following sections.

5.2 Bond Issuance Yields

First, bond issuance yields and underwriting fees around the deregulation are analyzed. Specifically, the spread over the maturity-matched treasury yield and the gross underwriting spread is considered. Both are expressed in basis points.

[Table 3 here]

In columns (1) and (2), the yield spread is regressed on the interaction of indicators for treatment and the post-deregulation period, i.e. $UB\ Relationship_i \times Post_t$. A firm with a lending relationship to a universal bank underwriter in the pre-period is able to issue bonds around 30 basis points more cheaply in the post period relative to a firm with a lending relationship to a commercial bank. This is statistically significant and of an economically meaningful magnitude.

In columns (3) and (4) the effect on underwriting fees is analyzed. There are several underwriting cost categories, e.g. manager's fee, concessions etc., which are combined in the gross spread. The analysis shows a decline in the gross spread of 10-15 basis points. This is indicative of lower underwriter information production costs for firms with a lending relationship to universal banks.

5.3 Bond and Loan Borrowing

The main analyses concern the question of whether reduced underwriting frictions increase the quantity of bonds issued. It is also analyzed whether this had an impact on the amount of loans that were issued by these firms. The results are presented in table 4.

[Table 4 here]

The dependent variable is the logarithm of the bond amount issued. The analysis starts with a base specification without any controls and fixed effects in column (1). Control variables, lagged by one period, are added in column (2). The model is then gradually saturated with firm and quarter fixed effects in column (3), industry-quarter and state-quarter fixed effects in column (4). The coefficients are stable across specifications, or, if anything, become larger as more fixed effects are included, even as the standard errors (clustered at the firm-level) increase. In column (5) the highly restrictive specification with state-industry-quarter fixed effects is presented, which estimates the

effects by comparing the issuance behavior of firms within the same state, three-digit-SIC industry, and quarter cell. The quarterly amount of bond debt issued increases by about 5 percent relative to the control group. This is highly statistically and economically significant.

What does the increased issuance of bond debt do to firms' issuance of bank loans? For one, it might simply be the case that an ease of issuance terms relaxes financial constraints. In that case, loan issuance may not change much at all. It is also conceivable that there is an advantage that a lending relationship to a universal bank might bring. This increases their demand for loans to deepen these relationships. The extant literature has also identified other mechanisms potentially at play: cross-selling of loans and investment banking products by universal banks may improve the monitoring abilities of these banks (Neuhann and Saidi, 2018). This may enable universal banks to offer better loan terms which in turn may increase the loan amounts issued by firms connected to universal banks. Qi (2020) finds that cross-selling non-loan products increases loan supply to firms. On the other hand, improved access to the bond market may induce firms to substitute away from more expensive bank loans to potentially cheaper arm-length debt (Balloch, 2018; Grosse-Rueschkamp et al., 2019). The net effect is thus an empirical question. This analysis is conducted in table 5.

[Table 5 here]

The specification is as in table 4, with the natural logarithm of the amount of term loans issued as dependent variable. The analysis is restricted to term loans as these are the type of loans most comparable to long-term bonds. The result is that firms with a lending relationship to a universal bank decrease their issuance of bank loans. The quarterly loan issuance amount decreases by around 3.5 percent for affected firms relative to the control group. This result is interpreted as indication that the substitution effect dominates any potential bank loan supply increase due to universal banks' cross-selling advantages.

5.4 Debt Substitution

Next, the substitution between bonds and bank loans is examined more carefully. To this end, the bond-loan substitution measure from Becker and Ivashina (2014) is employed as dependent variable in the regression analyses. The substitution indicator D_{it} is a dummy variable that equals one if firm i issues a bond in period t, and zero if it issues a loan. Importantly, it is not defined if the

firm raises both types of debt, or raises no debt. It thus conditions on positive debt demand[22] and measures *relative* credit decisions. For the specifications that include firm fixed effects, the coefficient of interest is only identified for individual firms that issue at least one of each debt types during the sample period. Employing this measure, therefore, rules out that prior results arise from, e.g., small firms without bond market access facing reduced loan supply from banks.

Theory as well as empirical results in table 3 suggest that firms with high informational frictions (e.g., those of lower credit quality) are especially likely to benefit from the improved underwriting abilities of universal banks. The next analyses tests these predictions. The outcome on credit quantity is unclear *ex-ante* as credit markets may still ration these borrowers despite lower issuance costs. Indicator variables *Investment Grade in Pre*, *High Yield in Pre* and *Unrated in Pre* take the value of one if a firm has an investment grade credit rating, a high yield credit rating or is unrated, respectively, and zero otherwise. Importantly, the analyses use *ex-ante* ratings as those obtained after the announcement may themselves be a response by firms to the deregulation, i.e. endogenous. The results are shown in table 6.

[Table 6 here]

The results suggest significant bond-loan substitution effects on the firm-level. The debt substitution effects are of especially large magnitude for high yield-rated firms, consistent with the reduction of informational frictions by universal bank underwriters. Investment grade-rated firms show a weaker response. Unrated firms do not appear to respond in a statistically significant magnitude to the deregulation. Given the high fixed costs of conduction a bond IPO, a smaller effect for firms without full access to bond markets may not be not surprising. At the same time, the ability of universal bank underwriters to better certify their borrowers' quality may help previously unrated firms access the bond market for the first time. This hypothesis is examined in more detail in the following section.

5.5 Bond Market Access

The main anlyses examines how the amount of bond debt issued changes, i.e. the *intensive* margin of bond issuance. This section raises the question of whether the *extensive* margin of bond issuance is affected as well. Issuing a bond for the first time, i.e. conducting a bond IPO, represents an

[22] Conditioning on positive debt demand reduces the number of observations significantly so the analyses do not include the full battery of fixed effects.

important milestone in the life-cycle of a firm (Hale and Santos, 2008). While gaining access to arm-length credit may confer a number of lasting benefits on the firm, in particular access to a cheaper form of credit (Schwert, 2020) and also improved bargaining power vis-à-vis banks (Hale and Santos, 2009), it involves significant upfront costs, e.g. legal fees or the costs of obtaining a credit rating. Another cost for first-time issuers is significant bond underpricing due to information problems that may disappear in seasoned bond offerings, as the issuer builds a reputation in the market (Cai et al., 2007).

Given enhanced certification abilities, universal banks may be particularly well suited to overcome the informational problems of first-time bond issuers and thereby facilitate their borrowers' access to the bond market. That hypothesis is explored in this section. First, simple descriptive facts are consistent with the conjecture: of the sample firms that have a lending relationship with a universal bank, the average number of first-time issuers was roughly constant per quarter across the pre- and post-period (10.6 vs. 10.2). Meanwhile, in the sample of firms firms that have a lending relationship with a commercial bank that number declined significantly (from 6.8 to 4.6). As the decision to enter the bond market may depend on a variety of firm- and industry specific characteristics, a more formal analysis is carried out. An indicator variable, $Bond\ Market\ Access_{it}$, equals one if a firm has access to the bond market in a given period, and zero if not. A firm has access once it has issued its first bond and for the purpose of this analysis is assumed not to lose access irrespectively of whether it issues further bonds during the sample period. The sample is collapsed into a pre- and post deregulation period, so the resulting panel has two observations per firm. To account for potential differences between treatment and control group firms, the analysis includes the same firm-level control variables as prior analyses, i.e. size, profitability, tangibility, leverage and market-to-book ratio, measured at the firm's pre-period mean. The analyses also includes fixed effects to account for potentially differential distributions of firms across states and industries between treatment and control group.

[Table 7 here]

The estimation results of the linear probability model are consistent with the hypothesis that an expansion in bank scope facilitates firms' access to the bond market. After the deregulation, the likelihood of firms with a lending relationship to a universal bank having access the bond market increases by 2.2 percentage points more than that of the control group (column 1), a 35% stronger increase. Accounting for firm-level characteristics (column 2) even slightly increases the coefficient

on the interaction term $UB\ Relationship_i \times Post_i$, suggesting the result is not driven by firm-level differences between treatment and control group[23]. Consistent with prior literature (Becker and Ivashina, 2014) this study considers both publicly and privately placed bonds. While issuing privately placed bonds is often a stepping stone to issuing public bonds, it could be argued that full market access is only achieved once a public bond has been issued (Hale and Santos, 2008). Therefore, this more restrictive definition of bond market access is considered in column 3. The results are consistent.

5.6 Real Effects

Do lower costs-of-debt and the improved access to bond markets affect also affect firms' asset side of the balance sheet, or does it merely represent a re-shuffling of claims on the firms cash flows? The following analysis examines the real effects of the deregulation. For this purpose, a number of firm-level outcome variables are regressed on the usual independent variables. The results are presented in tables 8 and 9.

[Table 8 and 9 here]

The results are strongly suggestive of positive real effects as consequence of the bond-loan substitution that is found in earlier analyses. In particular, firms with a lending relationship to universal banks are able to increase their investment, sales and employment growth, and profitability. Interestingly, overall leverage does not change significantly. This is consistent with firms trading off the lower marginal cost of bond debt with the loss of flexibility in restructuring bonds compared to bank loans, thus seeking to limit their overall leverage as they shift into bonds (Crouzet, 2018). In addition to a lower cost-of-debt, the positive firm effect on investment may result from two specific dimensions in which bonds differ from bank loans: bonds are generally of longer maturity so a higher bond share may decrease roll-over risk, allowing firms to make higher-risk but positive-NPV investments. Bonds also generally contain fewer covenants, so an increase in bond issuance may increase firm investment (Nini et al., 2009).

[23] The significance of the coefficient on $UB\ Relationship_i$ vanishes once controls are introduced suggesting that conditional on control variables, bond market access is not different between treatment and control group in the pre-period.

5.7 Parallel Trend Assumption

Next, the identifying assumptions are tested. Most importantly, to allow for a causal identification of the associations identified in the previous analyses, the control group must provide a good counterfactual to the treatment group. To interpret the difference in outcome between treatment and control group as caused by the treatment, the assumption is the following: had the treatment not occurred, the composition of debt issuance would have developed similarly. A parametric test of the parallel trend assumption is performed. One limitation of this study is that for the time period under consideration only debt issuance data is available but not data on debt outstanding. To reduce noise that may be amplified by credit markets' seasonal variation (Murfin and Petersen, 2016), bond and loan issuance data is aggregated to annual levels. The natural logarithms of the credit issuance amounts are regressed on the interaction of year and treatment indicators. Firm-level controls and fixed effects are used as before. Because the last quarter of 1996 is part of the post-treatment period, debt issuance in 1996-Q4 is attributed to the year 1997. The total issuance amounts of the years 1996 and 1997 are weighted accordingly to account for this adjustment. The estimates for the coefficients β_k are plotted along with their standard errors in Figure 4.

$$Debt\ Issuance_{it} = \sum_{k=1992}^{2001} \beta_k UB\ Relationship_i \times Year_k + X_{it-1} + \gamma_{st} + \lambda_{jt} + \mu_i + \epsilon_{it}$$

[Figure 4 here]

Figure 4 illustrates that there are no significant differences in the debt issuance composition before the treatment, while in the post-treatment period, the issuance of the types of debt significantly diverges relative to the control group.

How does the magnitude of the results relate to the overall increase of the bond share? The analyses in this paper likely underestimate the true effect that was caused by this particular reform for a number of reasons: (1) Banks are defined as universal bank if they had a section 20 subsidiary by 31 July, 1996. If banks classified as commercial banks turn into universal banks at some point during the post period, as indeed a number of banks do, firms in a relationship with them benefits just like treated firms. Yet, these firms are considered to be in the control group. (2) The potentially improved competitiveness of universal bank underwriters relative to pure play underwriters increases competition in the underwriting market (Gande et al., 1999) which likely also benefits firms not connected to a universal bank, i.e. the control group firms. (3) All sample firms are already public by sample construction. Theory suggests that gains in improved information

transmission using a universal bank underwriter as opposed to an investment bank underwriter accrue particularly to informationally opaque firms, i.e. the effect is likely larger on private firms. Moreover, all public firms have an existing underwriter relationship with the underwriter that took them public. As not just lending but also underwriter relationships are beneficial to firms (Manconi et al., 2018) the added effect of a lending relationship is likely less strong for public firms. (4) Banks with a section 20 subsidiary have been able to issue bonds since 1989. The central premise of the analysis is that the removal of the *de jure* restriction by the Federal Reserve Board enabled the information sharing and thus significantly improved the ability of universal banks to underwrite securities. However, results from the prior literature that are based on earlier sample periods (Gande et al., 1997) imply that firewalls may have been "leaky" even before the information exchange was legalized. Under this line of reasoning, some gains of the benefits of information sharing had been realized in the years before the reform. Estimates from the somewhat narrow deregulatory reform considered in the analyses in this paper thus likely underestimate the overall effect of universal banks on the corporate debt structure. This is also suggested by the descriptive results in the first subsection that considers a longer times series of underwriting spreads.

5.8 Bank Loan Supply

The hypothesis of this paper is that an increase in bond issuance due to improved bond market access is responsible for the decrease in bank loan issuance, i.e. the substitution hypothesis. What if causality runs the other way? One concern may be that a decrease in bank loan supply forces firms to tab the bond market in lieu of bank-based funding, for example in wake of the Russia/LTCM Crisis[24] during the second half of 1998. These events caused losses at some banks who decreased their loan supply to firms connected with them (Chava and Purnanandam, 2011).

To begin with, this hypothesis is not consistent with the results presented in table 3 that show a decrease in yield spreads and underwriting fees. If firms with a lending relationship to a stressed universal bank were forced to access the bond market, assuming an upward sloping bond supply curve, one might expect higher rather than lower spreads. Secondly, in robustness checks (presented in the Internet Appendix), it is shown that the results also hold at shorter horizons. In particular, the analyses is restricted to a period that ends in 1998-Q2.

There are further reasons for why loan supply is an important issue. The extant literature provides important arguments for why bank loan supply may actually increase rather than decrease,

[24] The Asia Crisis of 1997, in contrast, did not negatively affect U.S. banks (Kho and Stulz, 1999).

in particular, due to improved monitoring (Neuhann and Saidi, 2018) or as a way for universal banks to win underwriting mandates (Ljungqvist et al., 2006). An *increase* in loan supply by universal banks after the deregulatory event in light of a *decrease* of loan issuance by firms connected to them before the event, is prima facie evidence of a bank loan portfolio reallocation, where the decrease of loan demand by firms with improved access to the bond market induce banks to lend to other firms.

To shed light on the reasons for the decline in bank debt, bank loan spreads are analyzed. One implication of a decrease in bank loan supply would be an increase of the loan spreads. If, on the other hand, firms decrease their loan demand while banks' supply remains unchanged or even increases, one expects to see a reduction in the loan spread. Note, that just as in the analyses of the bond yield spread, it is crucial to control for all other factors that may influence loan pricing. The reason is that under the hypothesis of a decline of bank loan demand, firms that continue to borrow from banks are those that may be too small or opaque to access the bond market even under improved market access conditions. These firms generally face higher costs of external finance, thus failing to control for these factors adequately may lead to the false conclusion that higher loan spreads of firms connected to universal banks in the post-period are an indication of a decrease in loan supply.

The all-in-spread-drawn of loans is regressed on the interaction of the universal bank relationship dummy and post period, $Post_t \times \ UB\ Relationship_i$, as well as a vast array of loan- and firm-level controls and fixed effects. The results are presented in table 10.

[Table 10 here]

Conditional on controls and fixed effects, column (1) estimates a slight increase in the loan spread for firms with a banking relationship to a universal bank, albeit insignificantly. When firm fixed effects are introduced in column (2), the results show a significant reduction in the loan spread of around 30 basis points. This result is inconsistent with the idea that a reduction in loan supply is responsible for the decrease in loan issuance. Note that the sign on the coefficient flips when firm fixed effects are introduced to the regression equation. This is consistent with the hypothesis that the bank loan portfolio shifts towards higher risk borrowers that pay higher spreads. It also implies that there is an increase in loan risk that is priced by the banks but is only imperfectly captured by observable loan and borrower characteristics.

The next analysis directly examines the loan supply on the bank level using loan-level in-

formation from DealScan. Exploiting the fact that some firms have multiple bank relationships, a within-firm estimator helps to disentangle loan demand from loan supply (Khwaja and Mian, 2008). The results are presented in table 11.

[Table 11 here]

Column (1) presents the estimation results for all banks in the sample. Holding loan demand constant, firms have an almost 10 percent higher likelihood receiving a loan from a universal bank in the post-treatment period. This is strong evidence that, in fact, the decrease in loans issued by firms in a relationship to a universal bank are not caused by a decrease in loan supply. On the contrary, these results suggest an increase in loan supply. This, however, still leaves open the question of what is driving that supply increase. Do better monitoring abilities of banks make better priced loan offers to borrowers? Or does the decrease in loan demand from its borrowers lead to an increased balance sheet capacity that then enables these banks to extend loans to other borrowers?

To shed further light on this question, the equity ratio of banks is used as measure of bank capital constraints[25]. The sample is restricted to banks to banks with a equity ratio of below the sample median, and the results are presented in column (2). Capital-constrained banks increase their loan supply to firms by almost 18 percent, much higher than in the unrestricted sample. Although this result does not rule out that universal banks are better monitors due to cross-selling, it suggests that a decrease in loan supply may indeed be responsible for a bank loan portfolio reallocation. If universal banking is simply a better monitoring technology, unconstrained banks would be in a much better position to exploit their competitive advantage and better capture market share. That more constrained banks increase their loan supply more is indicative of the portfolio reallocation channel at least dominating any positive supply effects quantitatively.

6 Conclusions

This paper studies the effects of bank scope on firms' debt issuance. Descriptive evidence suggests a role for the rise of universal banking conglomerates in the process of credit disintermediation in the U.S. economy. Theory suggests that having a lending relationship to the bond issuer may

[25] To avoid enodgeneity issues, the equity ratio from 1993 before the start of the sample period is used. The market equity ratio is used as there is evidence that it is a more relevant predictor of lending than the regulatory ratio (Schwert, 2020).

improve an underwriter's certification ability. Informational economies of scope may also lower its underwriting cost. This article brings forward the hypothesis that universal bank underwriters reduce informational frictions in the primary market for corporate debt and can thus improve pricing and increase bond supply to firms. Firms react by substituting loan for bond debt. This hypothesis is tested in the context of the repeal of the Glass-Steagall Act and consistent evidence is found.

The empirical approach uses a specific deregulation in 1996 that abolished regulatory requirements on informational firewalls. Firewalls had restricted information sharing between universal banks' lending and underwriting units. After the deregulation, private information from lending relationships is used by universal banks to offer more effective underwriting services to firms. The results in this paper show that this mechanism improves firms' access to bond markets, both on the intensive and the extensive margin. At the same time, firms reduce their borrowing from banks. Further tests show that these results are not driven by a decrease in bank loan supply. Instead, as firms tap the bond market they decrease their loan demand which relaxes the lending constraint of banks, leading to an increase in bank loan supply. Finally, the results also suggest that firms benefit through higher investments, sales and employment growth, as well as profits.

The results also have policy implications. Glass-Steagall is perhaps one of the best-known financial market regulations, and its merits continue to be debated in U.S. politics. The legislation is sometimes seen as a way to curb the power of large banks and to restrain too-big-to-fail. The results in this paper highlight the benefits of the universal banking model to firms' access to debt markets and investment. Different policies that leave the universal banking model intact[26] may thus be better suited to address these issues.

The results presented in this paper raise several interesting questions. For example, firms reliant on bond debt may be able to reduce roll-over risk due to the longer maturity of bonds. At the same time, bond debt can be difficult to restructure in case of financial distress because of its more dispersed ownership. What is the net effect of these forces on firm' long-term survivability? Secondly, as firms shift their demand for debt finance to bond markets, banks face a decrease in loan demand. While banks increase their loan supply to those firms that still demand bank loans they may also be tempted to increase lending to less productive usage, such as real estate (Balloch, 2018). Could, therefore, the deregulation of Glass-Steagall and the associated rise of bond finance also indirectly have contributed to fueling the real estate bubble in the U.S.? Finally, while this

[26] e.g. stronger bank equity requirements

paper presents evidence that strongly suggests that improved underwriting conditions due to an expansion in bank scope played an important role in the rise of the bond share, it is unlikely to be the only cause. What other factors have contributed to the development? And how does the rise in public debt markets fit with the decline in public equity markets over a similar time period (Doidge et al., 2017)? These are some of the questions to be addressed by future research.

Altogether, this study highlights how institutional changes can catalyze long-term shifts in corporate finance patterns in the economy at large.

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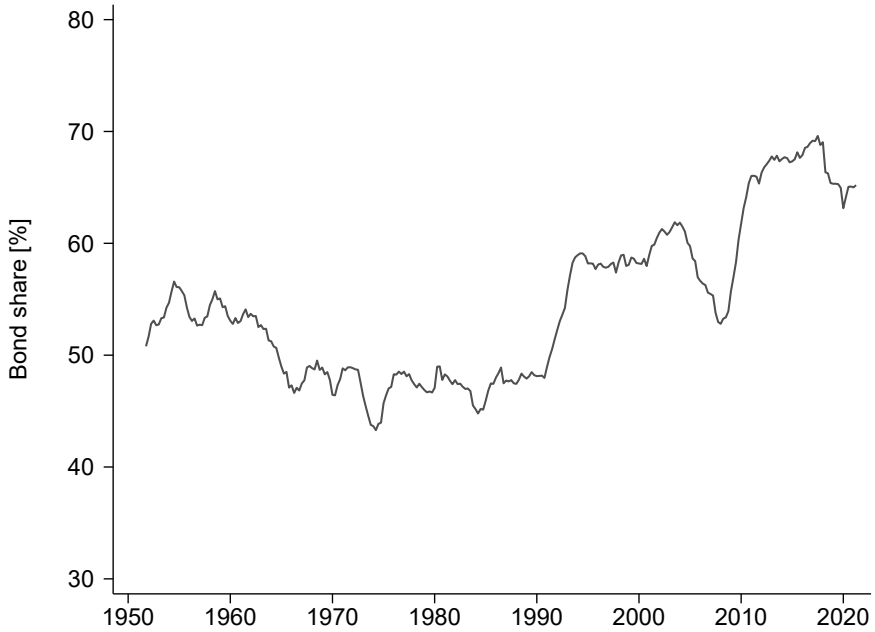
1 Appendix

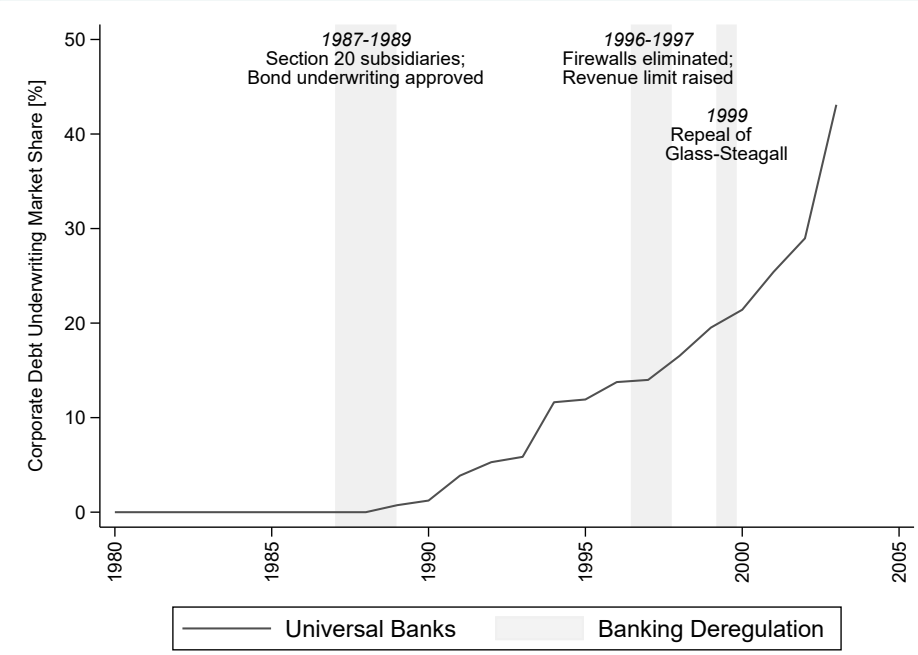
1.1 Figures

Figure 1: Bond debt as share of aggregate corporate debt outstanding



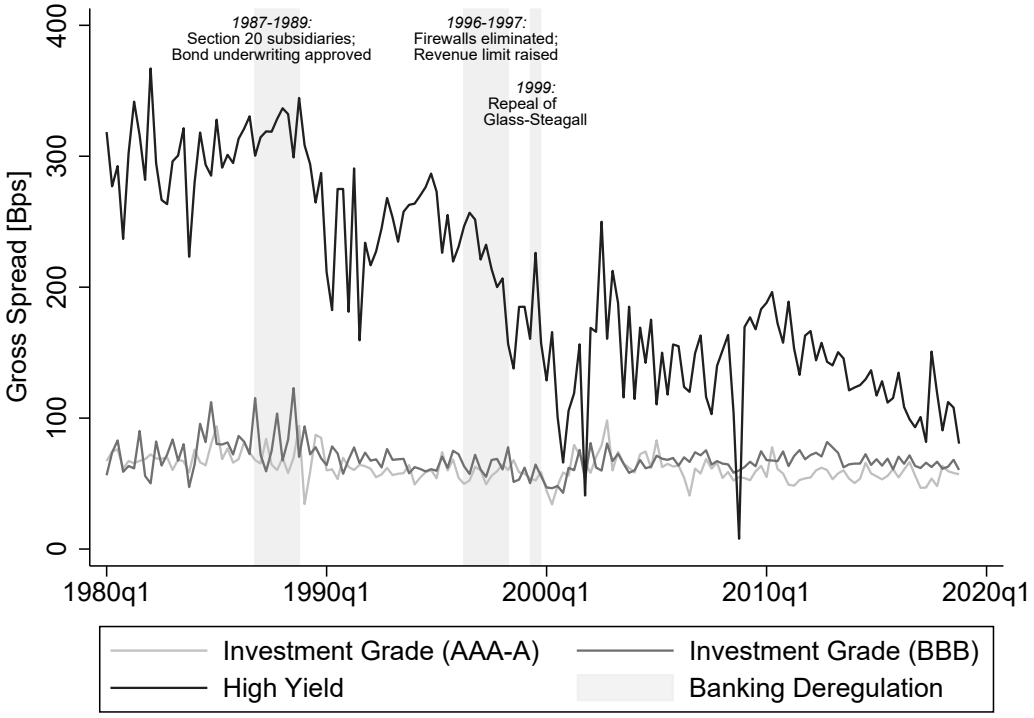
This figure plots bond debt as share of total debt outstanding in the non-financial corporate sector for the U.S. The source of data is the Flow of Funds table L.103 ("non-financial corporate business"). The share is plotted as the ratio of bonds to the sum of loans and bonds. Loan data are from data item FL104123005, while bonds are from data item FL104122005.

Figure 2: Universal bank underwriting market share



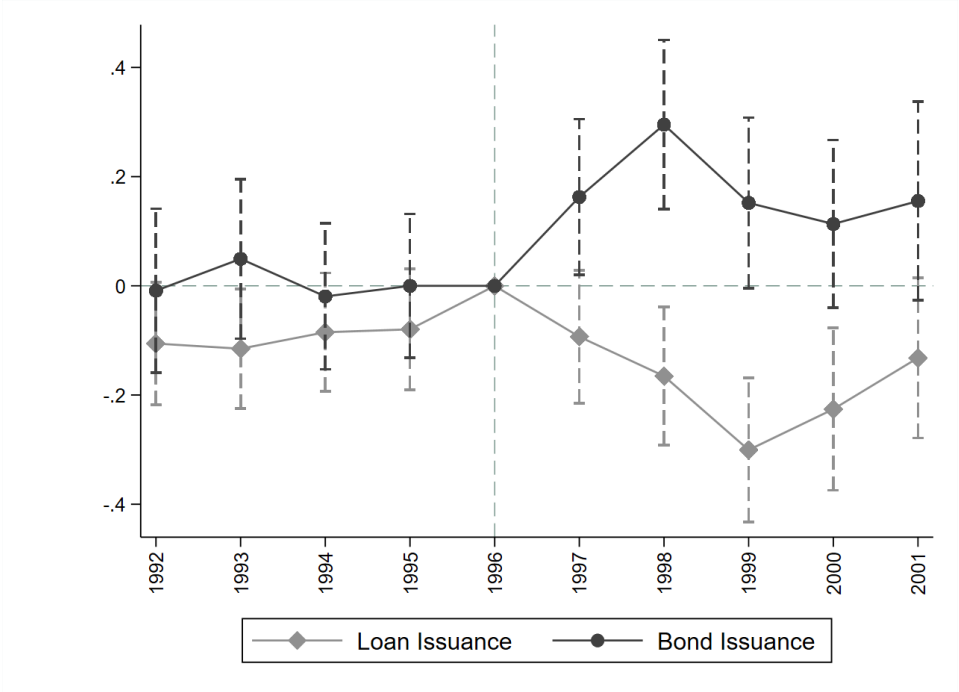
This figure plots the market share of universal bank underwriters in the corporate bond underwriting market in the U.S. It relates the universal bank market share to major banking deregulation episodes that affected the scope of investment banking activities permitted to commercial banks: (1) The approval of "section 20 subsidiaries" in 1987, and the extension of corporate bond underwriting powers to these entities in 1989; (2) the elimination of firewalls and lifting the revenue limits to 25% from 1996-1997; and (3) the Gramm-Leach-Bliley Act in November 1999 which effectively repealed Glass-Steagall. Data for the market share of universal bank underwriters is from Kim, Palia and Saunders (2008).

Figure 3: Bond underwriting fee



This figure plots the evolution of the mean of the gross underwriting spread for corporate bonds issuances by non-financial firms into the U.S. public bond market. The plot relates the development of the underwriting spread to major banking deregulation episodes that affected the scope of investment banking activities permitted to commercial banks: (1) The approval of "section 20 subsidiaries" in 1987, and the extension of corporate bond underwriting powers to these entities in 1989; (2) the elimination of firewalls and lifting the revenue limits to 25% from 1996-1997; and (3) the Gramm-Leach-Bliley Act in November 1999 which effectively repealed Glass-Steagall. The spread is expressed in basis points of the issuance amount, and is plotted separately for high investment grade (AAA-A), low investment grade (BBB), and high yield bond (BB and below) issues. The data is from SDC.

Figure 4: Debt issuance parallel trend



This figure plots the evolution of firm debt issuance in the ten years around the deregulation in 1996 for the treatment group relative to the control group. Specifically, this figure plots estimated coefficients from the following difference-in-differences specificiation: $ln(1+debt\ issued_{it}) = \sum_{k=1992}^{2001} \beta_k UB\ Relationship_i \times Year_k + X_{it-1} + \gamma_{st} + \lambda_{jt} + \mu_i + \epsilon_{it}$, where the dependent variable is the natural logarithm of firm-level debt issuance, that is the annual issuance amount of bonds and bank term loans. A 5-year window around the deregulation event in 1996 is considered. $Year_k$ equals one in year t and zero otherwise. 1996 is the omitted category. The treatment group indicator $UB\ Relationship_i$ equals one whether a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. Firm-level time-varying control variables are size, tangibility, leverage and market-to-book; all control variables are lagged by one period. Furthermore, γ_{st} are state-year fixed effects, λ_{jt} are industry-year fixed effects where industries are defined based on three-digit SIC codes, and μ_i are firm fixed effects. The dashed lines represent 90% confidence intervals, adjusted for firm-level clustering.

1.2 Tables

Table 1: Summary statistics (firm-panel)

	UB Relationship					*CB Relationship*				
	Mean	SD	p10	Median	p90	Mean	SD	p10	Median	p90
Size	5.804	1.856	3.500	5.712	8.361	4.731	1.776	2.540	4.576	7.211
Asset Growth	0.041	0.144	-0.053	0.019	0.150	0.048	0.154	-0.062	0.024	0.166
Profitability	0.003	0.071	-0.021	0.010	0.034	-0.001	0.083	-0.039	0.011	0.038
Tangibility	0.349	0.242	0.074	0.287	0.734	0.333	0.243	0.065	0.263	0.725
Leverage	0.268	0.232	0.003	0.238	0.543	0.196	0.195	0.000	0.155	0.448
Market-to-book	1.787	1.388	0.969	1.417	2.851	1.996	1.716	0.957	1.491	3.503
CapEx	0.018	0.022	0.000	0.011	0.042	0.020	0.025	0.000	0.012	0.049
Cash	0.071	0.110	0.003	0.027	0.206	0.115	0.162	0.003	0.043	0.344
Employment Growth	0.022	0.073	-0.033	0.007	0.100	0.025	0.078	-0.040	0.012	0.112
R&D	0.009	0.033	0.000	0.000	0.027	0.015	0.039	0.000	0.000	0.043
Acquisitions	0.006	0.022	0.000	0.000	0.011	0.005	0.020	0.000	0.000	0.004
Dividends	0.002	0.005	0.000	0.000	0.007	0.002	0.005	0.000	0.000	0.006
Working Capital	0.192	0.258	-0.039	0.180	0.488	0.239	0.287	-0.028	0.234	0.573
Cash	0.071	0.110	0.003	0.027	0.206	0.115	0.162	0.003	0.043	0.344
ln(Bonds)	0.211	1.000	0.000	0.000	0.000	0.089	0.649	0.000	0.000	0.000
ln(Termloans)	0.141	0.789	0.000	0.000	0.000	0.069	0.515	0.000	0.000	0.000
Bonds/Assets	0.004	0.033	0.000	0.000	0.000	0.003	0.031	0.000	0.000	0.000
Termloans/Assets	0.008	0.059	0.000	0.000	0.000	0.004	0.041	0.000	0.000	0.000
Observations	17,351					11,734				

This table reports the summary statistics for the key variables of the analyses. The statistics are reported separately for firms with a lending relationship to a universal bank (i.e. the treatment group) and to a commercial bank (i.e. the control group). The unit of observation is firm-quarter and the summary statistics are computed over the pre-deregulation period, i.e. Q1-1994-Q3-1996. All variables are defined in the appendix.

Summary statistics (bond panel)

	UB relationship					***CB relationship***				
	Mean	SD	p10	Median	p90	Mean	SD	p10	Median	p90
Yield Spread (Basis Points)	146.7	134.3	43.0	93.0	343.0	165.0	150.1	53.0	103.0	393.0
Underwriting Fee (Basis Points)	84.5	71.7	20.9	65.0	200.0	102.2	92.2	25.0	65.0	300.0
Issuance Amount (USD Mio.)	147.3	216.3	10.0	99.5	300.0	119.5	128.4	10.0	98.6	298.6
Time to Maturity (Months)	122.2	98.4	24.2	119.7	253.9	149.3	111.8	58.2	120.0	360.1
Bond IPO (0/1)	0.1	0.3	0.0	0.0	0.0	0.1	0.3	0.0	0.0	1.0
ln(Number of Issues)	3.0	1.3	1.1	3.0	4.6	2.5	1.3	0.7	2.5	4.7
ln(Underwriter Rank)	1.5	1.0	0.0	1.6	2.8	1.7	1.0	0.0	1.8	3.0
Medium Term Note (0/1)	0.3	0.5	0.0	0.0	1.0	0.2	0.4	0.0	0.0	1.0
Private Placement (0/1)	0.3	0.4	0.0	0.0	1.0	0.4	0.5	0.0	0.0	1.0
Subordinated (0/1)	0.1	0.3	0.0	0.0	0.0	0.1	0.3	0.0	0.0	1.0
Secured (0/1)	0.1	0.3	0.0	0.0	0.0	0.1	0.3	0.0	0.0	1.0
IG-rated in Pre (0/1)	0.7	0.5	0.0	1.0	1.0	0.7	0.5	0.0	1.0	1.0
HY-rated in Pre (0/1)	0.2	0.4	0.0	0.0	1.0	0.1	0.3	0.0	0.0	1.0
Unrated in Pre (0/1)	0.1	0.3	0.0	0.0	1.0	0.2	0.4	0.0	0.0	1.0
Observations	3,540					999				

This table reports the summary statistics for the bond panel. The statistics are reported separately for universal banks and commercial banks. The unit of observation is a single bond issuance. All variables are defined in the appendix.

Summary statistics (bank-loan panel)

	Universal Banks					***Commercial Banks***				
	Mean	SD	p10	Median	p90	Mean	SD	p10	Median	p90
Total Assets (USD bn)	92.65	84.46	17.62	59.63	225.85	77.05	129.75	1.97	13.47	260.24
Syndicated Loan Issuance (USD bn)	17.59	32.42	0.15	2.84	68.91	1.23	2.66	0.04	0.16	3.20
Tier-1 Ratio (%)	9.09	1.31	7.61	9.22	10.45	9.03	2.04	6.00	9.31	11.10
NPL Ratio (%)	1.13	0.80	0.42	0.87	2.35	1.65	2.13	0.55	0.70	5.97
Payout Ratio (%)	1.87	0.95	1.01	1.52	3.41	2.11	2.38	0.00	1.30	5.04
Market Equity Ratio (%)	10.63	2.64	6.74	9.95	14.63	10.81	2.11	8.26	10.74	14.04
Observations	17					15				

This table reports the summary statistics for the bank-loan-firm panel. The statistics are reported separately for universal banks and commercial banks, and in this table one observation is one bank. Tier-1, NPL, Payout and Market Equity are expressed as share of total assets. Total Assets and Syndicated Loan Issuance is in USD billion. Syndicated Loan Issuance is the average annualized value of the sample period before the deregulation, i.e. Q1-1994-Q3-1996. The other variables are from the last fiscal year before the sample period. Only banks that have a valid Dealscan-Compustat link (Schwert, 2018) and that have originated (as leadarranger) more than USD 100 million from Q1-1994-Q3-1996 are included. For banks that merge only the surviving entity is considered.

Table 2: Average underwriting fee (relative to time period 1980-1988)

	(1) All Bonds	(2) Investment Grade (AAA-A)	(3) Investment Grade (BBB)	(4) High Yield
Q1 1989 - Q3 1996	-14.5451***	-4.0928**	-11.8848***	-39.1877***
	(-7.22)	(-2.47)	(-3.56)	(-7.09)
Q4 1996 - Q3 1999	-15.9484***	2.2103	-11.3920**	-62.5273***
	(-7.87)	(1.36)	(-2.61)	(-7.49)
Q4 1999 - Q4 2007	-13.6496***	10.9152***	-7.2004*	-111.1258***
	(-5.00)	(4.20)	(-1.95)	(-14.11)
Q1 2008 - Q4 2018	-18.3662***	8.9547***	-8.7323**	-117.6360***
	(-7.39)	(3.78)	(-2.36)	(-15.17)
Bond Controls	Yes	Yes	Yes	Yes
Rating FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	18,590	9,875	5,764	2,897
Adj. R^2	0.694	0.262	0.199	0.554

This table reports the results from the estimation of a regression analyzing underwriting fees over time. The unit of observation is a bond issuance, the dependent variable is $Gross\ Spread_{it}$. The time periods reflect different regulatory regimes with respect to the permitted activities of universal banking: During the time period until Q4-1988 (the omitted category in the regression analysis) no bond underwriting was permitted. From Q1 1989 - Q3 1996 corporate bond underwriting was permitted to section 20 subsidiaries of commercial banks but firewalls and underwriting revenue limits were mandated. Firewalls were largely abolished and revenue limits lifted to 25% after Q3-1996. In Q4-1999 the remaining provisions of the Glass-Steagall Act were abolished. A last time period is introduced to account for the structural break that occured in the investment banking market during the financial crisis of 2008. Hence, the parameters of interest are the coefficients on the indicator variables for the respective time period, i.e. "Q1 1989 - Q3 1996", "Q4 1996 - Q3 1999", "Q4 1999 - Q4 2007" and"Q1 2008 - Q4 2018", which are equal to one if the bond is issued during the period, and zero otherwise. The omitted category is the time period before the onset of bank scope deregulation, Q1-1980 - Q4-1988, so that the coefficients represent the gross spread relative to that period. The regressions include bond-level controls $log(Years\ to\ Maturity)$, $log(IssuanceAmount)$, $Bond\ IPO(0/1)$, and $log(Num\ Issue)$, that is, the logarithm of the total number of bonds the firm hast issued. All variables are defined in the appendix. The regressions include credit rating fixed effects and industry fixed effects. t-statistics based on robust standard errors clustered at the quarter-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table 3: Effect of bank scope on bond yields and underwriting fees

	(1) Yield Spread	(2) Yield Spread	(3) Yield Spread	(4) Underwriting Fee	(5) Underwriting Fee	(6) Underwriting Fee
Post × UB Relationship	-32.511***	-26.120***	-28.595***	-15.952*	-19.891*	-19.726*
	(-4.02)	(-3.11)	(-3.38)	(-1.67)	(-1.89)	(-1.94)
Post × UB Relationship × High Yield in Pre		-52.593**			23.631	
		(-2.03)			(1.28)	
Post × UB Relationship × Bond IPO			-52.511*			33.215
			(-1.76)			(1.20)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bond Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Rating-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,117	2,117	2,117	2,035	2,035	2,035
Adj. R^2	0.842	0.844	0.843	0.692	0.696	0.693

This table reports the results from the estimation of a pooled panel regression analyzing the effect of bank scope on bond yields and bond underwriting fees. The dependent variable in columns (1) - (3) is the yield spread in basis points of a bond at issuance, i.e. the yield at issuance minus the maturity-matched risk-free yield. The dependent variable in columns (4) - (6) is the underwriting fee, i.e . the gross spread in basis points. The treatment group indicator $UB\ Relationship_i$ equals one if a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. $Post_t$ equals one after the deregulation announcement, i.e. Q4-1996 and later, and zero otherwise. $High\ Yield\ in\ Pre_i$ is an indicator variable if the firm had a high yield credit rating in the period before the deregulation, $Bond\ IPO_{it}$ is an indicator variable for whether the firm issues a bond for the first time. The sample period is six years from 1994-1999. The regression include bond-level as well as time-varying firm-leve control variables. Bond-level variables are $ln(Bond\ amount)$, $ln(Time\ to\ maturity)$ in years, $ln(Number\ of\ previous\ bond\ issues)$, $ln(Underwriter\ rank)$, indicators for whether the bond the first bond issued by that firm, whether it is a medium-term note, a private placement, subordinated or secured. Time-varying Firm-level control variables include $ln(totalassets)$, $tangibility$, $profitability$, $leverage$, $current\ ratio$ and the $interest\ coverage\ ratio$. All variables are defined in the appendix. Lower-order interaction terms (e.g., $Post\ x\ High\ Yield\ in\ Pre$, etc.) are included in the regressions, where appropriate, but not reported for reasons of space. The regressions also include industry fixed effects and quarter-rating fixed effects. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table 4: Effect of bank scope on bond issuance

	(1)	(2)	(3)	(4)	(5)
Post × UB Relationship	0.055***	0.047***	0.056***	0.057***	0.058**
	(3.19)	(2.58)	(2.99)	(2.68)	(2.08)
UB Relationship	0.122***	-0.021			
	(7.46)	(-1.27)			
Post	0.053***	-0.004			
	(5.09)	(-0.32)			
Size		0.153***	0.074***	0.076***	0.075***
		(17.57)	(6.49)	(6.10)	(4.13)
Profitability		-0.331***	0.010	0.012	0.032
		(-6.79)	(0.41)	(0.37)	(0.62)
Tangibility		0.204***	0.170***	0.166**	0.151
		(5.10)	(2.62)	(2.18)	(1.32)
Leverage		0.099**	-0.148***	-0.159***	-0.134**
		(2.11)	(-4.21)	(-4.15)	(-1.98)
Market-to-Book		0.015***	0.013***	0.011***	0.008**
		(3.85)	(4.88)	(3.99)	(2.23)
Firm FE	No	No	Yes	Yes	Yes
Quarter FE	No	No	Yes	No	No
State-Quarter FE	No	No	No	Yes	No
Industry-Quarter FE	No	No	No	Yes	No
State-Industry-Quarter FE	No	No	No	No	Yes
Observations	59,687	53,317	53,315	52,477	30,319
Adj. R^2	0.007	0.086	0.209	0.214	0.207

This table reports the results from the estimation of a pooled panel regression analyzing the effect of bank scope on bond debt financing. The unit of observation is the firm-quarter level. The dependent variable is $ln(1 + bond\ debt)_{it}$, i.e. the natural logarithm of the quarterly bond issuance in million USD. The treatment group indicator $UB\ Relationship_i$ equals one if a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. $Post_t$ equals one after the deregulation announcement, i.e. Q4-1996 and later, and zero otherwise. The sample period is six years from 1994-1999. The regression in column (2) - (5) include time-varying firm-level controls, $size_{it-1}$, $tangibility_{it-1}$, $profitability_{it-1}$, $leverage_{it-1}$, $market\ to\ book_{it-1}$. All variables are defined in the appendix. The regressions include firm fixed effects, quarter fixed effects, state-quarter fixed effects, industry-quarter fixed effects and state-industry-quarter fixed effects, where indicated. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table 5: Effect of bank scope on loan issuance

	(1)	(2)	(3)	(4)	(5)
Post × UB Relationship	-0.036***	-0.035***	-0.031**	-0.037***	-0.036*
	(-3.15)	(-2.93)	(-2.49)	(-2.63)	(-1.70)
UB Relationship	0.072***	0.037***			
	(7.94)	(4.24)			
Post	0.019**	0.015*			
	(2.49)	(1.93)			
Size		0.016***	-0.002	-0.003	-0.010
		(6.59)	(-0.19)	(-0.32)	(-0.77)
Profitability		0.010	-0.002	-0.008	-0.011
		(0.40)	(-0.09)	(-0.24)	(-0.25)
Tangibility		-0.075***	-0.001	0.041	0.148
		(-4.36)	(-0.02)	(0.57)	(1.60)
Leverage		0.233***	-0.057*	-0.078**	-0.102**
		(8.71)	(-1.70)	(-2.30)	(-2.13)
Market-to-Book		-0.003*	0.000	0.002	0.004
		(-1.81)	(0.20)	(0.98)	(1.62)
Firm FE	No	No	Yes	Yes	Yes
Quarter FE	No	No	Yes	No	No
State-Quarter FE	No	No	No	Yes	No
Industry-Quarter FE	No	No	No	Yes	No
State-Industry-Quarter FE	No	No	No	No	Yes
Observations	59,687	53,317	53,315	52,477	30,319
Adj. R^2	0.001	0.009	0.044	0.050	0.071

This table reports the results from the estimation of a pooled panel regression analyzing the effect of bank scope on term loan financing. The unit of observation is the firm-quarter level. The dependent variable is $ln(1 + term\ loan)_{it}$, i.e. the natural logarithm of the quarterly term loan issuance in million USD. The treatment group indicator $UB\ Relationship_i$ equals one if a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. $Post_t$ equals one after the deregulation announcement, i.e. Q4-1996 and later, and zero otherwise. The sample period is six years from 1994-1999. The regressions in column (2) - (5) include time-varying firm-level controls, $size_{it-1}$, $tangibility_{it-1}$, $profitability_{it-1}$, $leverage_{it-1}$, $market\ to\ book_{it-1}$. All variables are defined in the appendix. The regressions include firm fixed effects, quarter fixed effects, state-quarter fixed effects, industry-quarter fixed effects and state-industry-quarter fixed effects, where indicated. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table 6: Bond-loan substitution

	(1)	(2)	(3)
Post × UB Relationship	0.062**	0.082**	
	(2.01)	(2.31)	
Post × UB Relationship × Investment Grade in Pre			0.070*
			(1.86)
Post × UB Relationship × High Yield in Pre			0.210**
			(2.20)
Post × UB Relationship × Unrated in Pre			0.045
			(0.56)
Post	-0.027		
	(-1.02)		
UB Relationship	-0.027		
	(-1.06)		
Size	0.135***	0.143***	0.132***
	(35.00)	(5.55)	(4.84)
Profitability	-0.012	0.381**	0.340*
	(-0.07)	(1.97)	(1.75)
Tangibility	0.213***	0.338**	0.315**
	(5.86)	(2.53)	(2.39)
Leverage	-0.069	-0.048	-0.052
	(-1.45)	(-0.60)	(-0.68)
Market-to-Book	0.006	0.003	0.006
	(0.73)	(0.21)	(0.48)
Firm FE	No	Yes	Yes
Quarter FE	No	Yes	Yes
Observations	3,533	2,899	2,899
Adj. R^2	0.359	0.547	0.550

This table reports the results from the estimation of a pooled panel regression analyzing the effect of bank scope on debt type substitution. The dependent variable is the bond-loan substitution indicator D_{it}. It equals one if firm i issues a bond in quarter t, and zero if it issues a loan. If a firm does not issue any debt, or issues both types of debt D_{it} is not defined. The treatment group indicator $UB\ Relationship_i$ equals one if a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. $Post_t$ equals one after the deregulation announcement, i.e. Q4-1996 and later, and zero otherwise. The sample period is six years from 1994-1999. The sample is further split into firms rated investment grade, high-yield, as well as unrated firms. The credit ratings are all measured in in the period before the deregulation. The unit of observation is the firm-quarter level. Lower-order interaction terms (i.e. *Post x Unrated in Pre* etc.) are included in the regressions, where applicable, but not reported for reasons of space.The regression include time-varying firm- level controls, $size_{it-1}$, $tangibility_{it-1}$, $profitability_{it-1}$, $leverage_{it-1}$, $market\ to\ book_{it-1}$. All variables are defined in the appendix. The regressions include firm fixed effects and quarter fixed effects, where indicated. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table 7: Bond Market Access

	(1) Bond Market Access	(2) Bond Market Access	(3) Bond Market Access (*public*)
Post × UB Relationship	0.023**	0.025**	0.020***
	(2.25)	(2.35)	(2.96)
Post	0.061***	0.060***	0.020***
	(8.38)	(7.81)	(4.38)
UB Relationship	0.185***	0.010	0.002
	(10.19)	(0.59)	(0.15)
Size		0.138***	0.124***
		(29.83)	(26.68)
Profitability		-0.450***	-0.536***
		(-2.71)	(-4.17)
Tangibility		-0.016	-0.032
		(-0.31)	(-0.72)
Market-to-book		-0.011***	0.002
		(-2.79)	(0.47)
Leverage		0.362***	0.350***
		(7.00)	(7.42)
Industry FE	No	Yes	Yes
State FE	No	Yes	Yes
Observations	5,346	4,986	4,986
Adj. R^2	0.044	0.423	0.466

This table reports the results from the estimation of a linerar probability regression analyzing the effect of bank scope on firms' access to bond markets. Data on the firm-time level, and the sample is collapsed into a pre-period and a post-period. The dependent variable $Bond\ Market\ Access_{it}$ equals one if a firm has issued a bond before or during the respective period, and zero otherwise. In columns (1) and (2) the analysis includes both publicly offered as well as privately placed bonds, in column (3) the analysis is limited to publicly offered bonds. The treatment group indicator $UB\ Relationship_i$ equals one if a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. $Post_t$ equals one after the deregulation announcement, i.e. Q4-1996 and later, and zero otherwise. The sample period is six years from 1994-1999. The regression include firm-level controls $Size_i$, $tangibility_i$, $profitability_i$, $leverage_i$, $market-to-book_i$, all measured at their pre-period mean. All variables are defined in the appendix. The regressions include industry fixed effects and state fixed effects, where indicated. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table 8: Firm-level real effects (1/2)

	(1) Asset Growth	(2) Leverage	(3) Capex	(4) Sales Growth	(5) Employment Growth	(6) Profitability
Post × UB Relationship	0.002	-0.005	0.001**	0.027**	0.005**	0.006***
	(0.72)	(-0.66)	(2.37)	(2.30)	(2.10)	(2.81)
Profitability	0.061***	-0.365***	0.011***	0.449***	0.083***	0.131***
	(3.25)	(-6.79)	(6.86)	(6.78)	(8.06)	(4.88)
Tangibility	0.145***	0.204***	0.002	-0.247***	-0.035***	-0.042***
	(9.25)	(6.76)	(0.77)	(-3.45)	(-2.86)	(-4.64)
leverage_lag	-0.102***		-0.011***	-0.047	-0.036***	-0.023**
	(-10.54)		(-8.78)	(-1.28)	(-5.65)	(-2.23)
Market-to-Book	0.028***	0.007	0.002***	0.047***	0.009***	-0.001
	(12.06)	(1.24)	(8.51)	(7.84)	(12.04)	(-0.31)
Size		0.032***	-0.000	0.017	-0.008***	0.000
		(4.14)	(-0.79)	(1.33)	(-3.81)	(0.01)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	52,630	52,574	52,630	52,481	50,290	52,517
Adj. R^2	0.124	0.748	0.540	0.208	0.295	0.300

This table reports the results from the estimation of a pooled panel regression analyzing the effect on firm-level real variables. The unit of observation is the firm-quarter level. All variables are defined in the appendix. The treatment group indicator UB_i equals one if a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. $Post_t$ equals one after the deregulation announcement, i.e. Q4-1996 and later, and zero otherwise. The sample period is six years from 1994-1999. The regression include time-varying firm-level controls, all lagged by one period. The regressions include firm fixed effects and quarter fixed effects. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table 9: Firm-level real effects (2/2)

	(1) R&D	(2) Acquisitions	(3) Dividends	(4) Cash	(5) Asset Volatility	(6) Working Capital
Post × UB Relationship	-0.000	-0.001	0.000	-0.003	-0.003	0.015
	(-0.25)	(-1.52)	(0.48)	(-0.90)	(-0.51)	(1.17)
Size	-0.001	-0.003***	-0.000***	-0.019***	0.005	0.103***
	(-1.55)	(-7.11)	(-3.77)	(-6.64)	(0.73)	(3.29)
Profitability	-0.023***	0.005***	-0.000	0.032***	-0.012	0.620***
	(-4.40)	(4.57)	(-0.66)	(2.58)	(-0.33)	(3.19)
Tangibility	0.013***	-0.002	0.000	-0.323***	-0.015	-0.185
	(2.94)	(-1.19)	(0.58)	(-16.29)	(-0.66)	(-1.17)
leverage_lag	-0.007	-0.010***	-0.001*	-0.073***	0.042*	-0.689***
	(-1.09)	(-10.01)	(-1.74)	(-9.93)	(1.71)	(-3.95)
Market-to-Book	-0.001	0.001***	0.000	0.006***	0.003	-0.083**
	(-0.86)	(4.79)	(1.58)	(4.31)	(0.81)	(-2.14)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	52,630	52,630	52,630	52,394	51,925	50,936
Adj. R^2	0.553	0.144	0.659	0.750	0.901	0.477

This table reports the results from the estimation of a pooled panel regression analyzing the effect on firm-level real variables. The unit of observation is the firm-quarter level. All variables are defined in the appendix. The treatment group indicator UB_i equals one if a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. $Post_t$ equals one after the deregulation announcement, i.e. Q4-1996 and later, and zero otherwise. The sample period is six years from 1994-1999. The regression include time-varying firm-level controls, all lagged by one period. The regressions include firm fixed effects and quarter fixed effects. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table 10: Effect on loan spreads

	(1) Loan Spread	(2) Loan Spread
Post × UB Relationship	6.449	-25.250**
	(0.99)	(-2.07)
UB Relationship	-3.962	
	(-0.81)	
Firm Controls	Yes	Yes
Loan Controls	Yes	Yes
Rating-Quarter FE	Yes	Yes
Industry-Quarter FE	Yes	Yes
State-Quarter FE	Yes	Yes
Loan Purpose FE	Yes	Yes
Firm FE	No	Yes
Observations	7,603	6,915
Adj. R^2	0.715	0.852

This table reports the results from the estimation of a pooled panel regression analyzing the effect of the deregulation on loan spreads. The dependent variable is the loan spread in basis points above a benchmark index. The treatment group indicator $UB\ Relationship_i$ equals one if a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. $Post_t$ equals one after the deregulation announcement, i.e. Q4-1996 and later, and zero otherwise. The sample period is six years from 1994-1999. The regression include loan-level as well as time-varying firm-level control variables. loan-level control variables include $ln(Loan\ amount)$, $ln(Time\ to\ maturity)$ in years, an indicator for whether the loan is secured, indicators for the type of loan (term loan, revolving credit, bridge loan or other), as well as indicators the loan purpose. Firm-level control variables include $size$, $tangibility$, $profitability$, $leverage$, $current\ ratio$, $interest\ coverage\ ratio$ and an indicator for whether the firm has bond market access. All variables are defined in the appendix. The regressions also include rating-quarter fixed effects, industry-quarter fixed effects, state-quarter fixed effects, and firm fixed effects, where indicated. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table 11: Bank loan supply

	(1) All Banks	(2) Constrained Banks
Post x UB	0.1020*	0.2367***
	(1.90)	(7.45)
Firm-Year FE	Yes	Yes
Firm-Bank FE	Yes	Yes
Observations	9,144	4,986
Adj. R^2	-0.194	-0.147

This table reports the results of difference-in-differences regression analyzing probability of loan issuances before versus after the deregulation. The analysis is based on data on the borrower-bank-time level where loans are aggregated at an annual level. The dependent variable $pr(Loan_{it})$ is an indicator variable that equals one if firm i receives a loan in period t from bank j (as lead arranger), and zero otherwise. Banks are constrained if their equity ratio is smaller than the sample median; the value is taken in 1993, i.e. before the begin of the sample period. The treatment group indicator UB equals one for banks that had a section 20 subsidiary at or before the announcement. $Post_t$ equals one in 1997 and later. All variables are defined in the appendix. The regressions include firm fixed-year effects and bank-firm fixed effects. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table 12: Variable Definition

Variable	***Source***	***Definition***
Yield spread	SDC	Spread in basis points of the offering yield over a maturity-matched risk-free rate.
Underwriter fee	SDC	Gross spread in basis points.
High Yield in Pre	Compustat, SDC	Received a credit rating lower than BBB- on the S&P scale during the pre-deregulation period.
Unrated in Pre	Compustat, SDC	Has not received a credit rating during the pre-deregulation period.
ln(time to maturity)	SDC	Natural logarithm of the time to maturity.
ln(# previous issues)	SDC	Natural logarithm of the number of previously issued bond securities.
ln(underwriter rank)	SDC	Natural logarithm of the rank of the bookrunning underwriter in that year measured by number of offerings underwritten as bookrunner.
Current ratio	Compustat	Ratio of current assets to current liabilities: act/lct.
Interest coverage ratio	Compustat	Ratio of operating earnings to interest expenses: $oiadp/xinq$.
Size	Compustat	Natural logarithm of total (book) assets: $ln(at)$.
Tangibility	Compustat	Natural logarithm of property, plant and equipment: $ln(ppent)$.
Profitability	Compustat	Ratio of operating earnings to total assets: $oiadp/at$.
Leverage	Compustat	Ratio of longterm debt to total assets: $dltt/at$.
Market-to-book	Compustat	Market-to-book ratio of assets: $(at - ceq + csho * prcc)/at$.
ln(bonds)	SDC	Natural logarithm of bonds issued plus one: $ln(bondsissued + 1)$.
ln(termloans)	DealScan	Natural logarith of termloans issued plus one: $ln(termloansissued + 1)$.
Bond market access	SDC	Indicator variable that equals one if a firm has issued a bond during or before the respective period, and zero otherwise.
Asset growth	Compustat	Symmetrical growth rate of total assets: $(at - at_{t-1})/(0.5 * at + 0.5 * at_{t-1})$.
Cash	Compustat	Ratio of cash and short-term investments to total assets: che/at.
Capex	Compustat	Ratio of capital expenditure to fixed assets: $capx/ppent$.
Sales growth	Compustat	Symmetrical growth rate of sales: $(sale - sale_{t-1})/(0.5 * sale + 0.5 * sale_{t-1})$.
R&D	Compustat	Ratio of research and development expenditures to total assets: xrd/at.
Acquistions	Compustat	Ratio of acquisition expenditures to total assets: acq/at.
Dividends	Compustat	Ratio of the sum of common and preferred dividends to total assets: $(dv + dvp)/at$.
Sales growth volatility	Compustat	Five-year forward-looking standard deviation of quarterly sales growth : $SD(Salesgrowth)_{t,t+20}$.
Return volatility	Compustat	Five-year forward-looking standard deviation of quarterly return on assets : $SD(profitability)_{t,t+20}$.
ln(employees)	Compustat	Natural logarithm of the total number of employees: $ln(employees)$.
Loan Spread	DealScan	All-in-drawn spread in basis points over benchmark interest rate (i.e. LIBOR).

Description of construction of data in data section of paper.

Table 13: Establishment of Universal Banks

Lender	***Year of establishment as universal bank*** *(Section 20 or M&A)*
Pre-August 1, 1996	
Equitable	1985
Marine Midland Bank	1986
Citicorp	1987
Credit Suisse (First Boston)	1987
J.P. Morgan	1987
Bankers Trust	1987
PNC	1987
First Chicago NBD	1988
Norstar Bank	1988
Fleet Bank	1988
Chase Manhattan	1988
Bank One	1989
Barnett Bank	1989
NationsBanc	1989
Southtrust	1989
First Union	1989
Deutsche Bank	1989
Liberty National Bank	1989
Norwest Bank	1989
Liberty National Bank	1989
BankBoston	1990
Dauphine Deposit Corporation	1991
Chemical Bank	1991
Sovran Bank	1991
National Westminster Bank	1991
Bank of America	1992
HSBC Bank USA	1992
Security Pacific Bank	1992
Huntington Bancshares	1992
Travellers Group	1993
Republic National Bank	1994
National City	1994
SunTrust	1994
Mellon	1995
KeyBank	1996
Bank South	1996
Post-August 1, 1996	
Bank of New York	1997
CoreStates	1997
Swiss Bank Corp	1997
U.S. Bank Corp	1997
Commerce Bank	1998
Wachovia Bank	1998
BB&T	1999

This tables lists the lenders in the sample that until the end of the sample period become universal banks. This can be done either through M&A with an existing investment bank, or through the opening of a section 20 subsidiary. Only banks that gain underwriting powers *before* the deregulation on August 1, 1996 are designated as Universal Bank in the empirical implementation of the paper. Unlisted here are banks that remain commercial banks throughout the sample period, and investment banks, as well as all other (non-bank) lenders.

2 Internet Appendix

Figure A1: Wall Street Journal, 31 August 1996

Fed Set to Ease Bank Underwriting Curbs

Plan Allows Broader Push Into Securities Business By Many in the Industry

By Jeffrey Taylor
And Stephen E. Frank
Staff Reporters of The Wall Street Journal

The Federal Reserve proposed rule changes that appear likely to let banks aggressively expand their presence in the securities business.

The banking industry hailed the proposal as a consumer-friendly step that would boost competition for securities underwriting business. But it won't end calls from both banks and securities firms for comprehensive banking-law reform, nor make it any easier to reconcile their fractious views on what should be changed.

The Fed proposed raising the limit on bank securities activities to 25% of revenue in their securities affiliates from the current 10%, acting on a recommendation from House Banking Committee Chairman Jim Leach (R., Iowa) after he shelved reform legislation two months ago because of "partisan and interest-group wrangling."

Other Proposals

The Fed also proposed eliminating three so-called fire walls restricting banks' roles in securities transactions. And it proposed eliminating the requirement that banks count interest income earned from securities holdings toward their 25% cap on securities-related revenue.

"This is very good news," said Larry LaRocco, managing director of the American Bankers Association's securities affiliate. "The Fed has addressed the three most onerous fire wall issues and the revenue cap that has been hamstringing the banking industry for years."

The securities industry, which stands to see its market share trimmed by the proposal, was understandably less enthusiastic. "We'd much prefer to see comprehensive reform passed than piecemeal solutions to antiquated laws governing the financial services industry," said Steve Judge, senior vice president for government affairs at the Securities Industry Association. He called the Fed proposals "a step backward."

For years, bitter disagreements between these industries and between the two major political parties have scuttled efforts to dismantle Depression-era legal barriers between banks and securities firms. Rep. Leach said yesterday he still hopes a more modest bill he has been circulating in Congress can pass in the current session. Among other things, it would allow banks to dabble in computer-banking software and other fields now dominated by companies not subject to strict banking regulations.

Quick Vote Seems Likely

The Fed board set a 60-day comment period for the revenue-cap increase and asked for comment by Sept. 3 on the other proposals, signaling its widely anticipated intention to move quickly toward a vote.

To date, the Fed has allowed 38 of the bank holding companies it regulates to operate securities businesses in separately capitalized divisions, taking advantage of a loophole found in Section 20 of the 1933 Glass-Steagall Act. Just 23 of those banks are based in the U.S., and their "Section 20 affiliates" have been allowed to derive only 10% of their revenue from so-called "ineligibile activities," such as underwriting corporate debt and equity securities. Other banks aren't permitted to engage in such underwriting, and the vast majority of banks doing business in the U.S. won't be affected by the Fed's proposed action.

Meantime, the Office of the Comptroller of the Currency, which regulates national banks, is also expected to move to give banks additional freedom to operate insurance, securities and other lines of business.

The Fed's proposals, said Donald H. Layton, a vice chairman at Chase Manhattan Corp., would "allow us to grow with confidence." But he predicted Chase could outgrow the 25% cap within a few years. Others in the banking industry praised the proposals, but saw the need for additional steps: "This is incremental, but to have a really competitive financial system, we need to totally eliminate the Glass-Steagall Act," said Rachel Robbins, general counsel at J.P. Morgan & Co.

Probable Effects

Analysts said the proposed change probably would have two immediate effects. First, it might prompt banks to restructure their balance sheets, because it reduces the amount of so-called "eligible revenues" – such as those from general-obligation municipal bonds and Treasury notes – they need to maintain in their Section 20 affiliates to offset current securities underwriting revenue. "Banks have had to bulk up their Section 20 affiliates like crazy," said Charles Gabriel, vice president for Washington research at Prudential Securities Inc. "Their first response to having these thresholds raised is going to be to ease up a little bit, sell off Treasurys and increase their return on equity." Mr. Gabriel said some banks might even be prompted to engage in stock buybacks.

More significant, perhaps, is the prospect that a higher cap would allow banks to actually purchase broker-dealers. Last year, for example, Germany's **Bayerische Vereinsbank** expressed interest in purchasing New York-based **Oppenheimer** & Co. But the bank dropped that plan when it realized Oppenheimer's securities underwriting revenue would place the bank in violation of Section 20. Now, observers say, such a deal might be more viable.

"It should make it more economic for acquisitions across a whole spectrum of size ranges," said Judah Kraushaar, an analyst with Merrill Lynch & Co. Mr. Kraushaar said the "chairman of more than one bank" has told him that, with a 10% cap, acquiring a broker-dealer wouldn't be viable, but at 25%, "they might take a fresh look."

That might be particularly true of foreign banks, many of which are eager to break into the U.S. securities markets. Within the U.S., experts said any deals would probably involve mid-size commercial banks and broker-dealers, rather than the giant firms. "The more you build yourself, the less it makes sense to buy," explained a senior executive at a major American Section 20 bank, adding, however, that "I've learned never to say never."

Who Stands to Gain

U.S. banks with securities-underwriting privileges and the year privileges were granted:

Bankers Trust New York	**1987**	First Union	**1989**	First of America	**1994**
Chase Manhattan	1987	NationsBank	1989	National City	1994
Citicorp	1987	Norwest	1989	Republic New York	1994
J.P. Morgan	1987	SouthTrust	1989	SunTrust Banks	1994
PNC Financial	1987	Banc One	**1990**	Synovus Financial	1994
First Chicago NBD	**1988**	BankAmerica	**1992**	Mellon Bank	**1995**
Fleet Financial	1988	Huntington Bancshares	1992	KeyCorp	**1996**
Barnett Banks	1989	Bank South	**1993**		

Source: Federal Reserve Board

Table A1: Effect of bank scope on bond issuance: Bonds/Assets

	(1)	(2)	(3)	(4)
Post x UB	0.0014**	0.0015**	0.0017**	0.0016
	(2.36)	(2.39)	(2.27)	(1.40)
UB	-0.0003			
	(-0.72)			
Post	0.0004			
	(1.01)			
Controls	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes
Quarter FE	No	Yes	No	No
State-Quarter FE	No	No	Yes	No
Industry-Quarter FE	No	No	Yes	No
State-Industry-Quarter FE	No	No	No	Yes
Observations	53,604	53,602	52,772	30,577
Adj. R^2	0.011	0.028	0.014	-0.017

This table reports the results from the estimation of a pooled panel regression analyzing the effect of bank scope on bond debt financing. The unit of observation is the firm-quarter level. The dependent variable is $Bonds/Assets_{it}$. The treatment group indicator UB_i equals one if a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. $Post_t$ equals one after the deregulation announcement, i.e. Q4-1996 and later, and zero otherwise. The sample period is six years from 1994-1999. The regression include time-varying firm-level controls, $ln(totalassets)_{it-1}$, $tangibility_{it-1}$, $profitability_{it-1}$, $leverage_{it-1}$, $market\ to\ book_{it-1}$, all lagged by one period. All variables are defined in the appendix. The regressions include firm fixed effects, quarter fixed effects, state-quarter fixed effects, industry-quarter fixed effects and state-industry-quarter fixed effects, where indicated. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table A2: Effect of bank scope on loan issuance: Loans/Assets

	(1)	(2)	(3)	(4)
Post x UB	-0.0023***	-0.0019**	-0.0016	-0.0014
	(-2.78)	(-2.16)	(-1.62)	(-1.04)
UB	0.0028***			
	(4.33)			
Post	0.0012*			
	(1.96)			
Controls	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes
Quarter FE	No	Yes	No	No
State-Quarter FE	No	No	Yes	No
Industry-Quarter FE	No	No	Yes	No
State-Industry-Quarter FE	No	No	No	Yes
Observations	53,604	53,602	52,772	30,577
Adj. R^2	0.005	0.033	0.034	0.113

This table reports the results from the estimation of a pooled panel regression analyzing the effect of bank scope on bank term loan debt financing. The unit of observation is the firm-quarter level. The dependent variable is $Termloans/Assets_{it}$. The treatment group indicator UB_i equals one if a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. $Post_t$ equals one after the deregulation announcement, i.e. Q4-1996 and later, and zero otherwise. The sample period is six years from 1994-1999. The regression include time-varying firm-level controls, $ln(totalassets)_{it-1}$, $tangibility_{it-1}$, $profitability_{it-1}$, $leverage_{it-1}$, $market\ to\ book_{it-1}$, all lagged by one period. All variables are defined in the appendix. The regressions include firm fixed effects, quarter fixed effects, state-quarter fixed effects, industry-quarter fixed effects and state-industry-quarter fixed effects, where indicated. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table A3: Effect of bank scope on bond issuance: Pr(Bond Issuance)

	(1)	(2)	(3)	(4)
Post x UB	0.0063*	0.0072**	0.0064	0.0075
	(1.75)	(1.96)	(1.54)	(1.38)
UB	-0.0010			
	(-0.31)			
Post	-0.0023			
	(-1.01)			
Controls	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes
Quarter FE	No	Yes	No	No
State-Quarter FE	No	No	Yes	No
Industry-Quarter FE	No	No	Yes	No
State-Industry-Quarter FE	No	No	No	Yes
Observations	53,604	53,602	52,772	30,577
Adj. R^2	0.080	0.193	0.200	0.198

This table reports the results from the estimation of a pooled panel linear probability regression analyzing the effect of bank scope on bond debt financing. The unit of observation is the firm-quarter level. The dependent variable $Pr(Bond)_{it}$ is an indicator variable that equals one if in a given quarter the firm issued a bond, and zero otherwise. The treatment group indicator UB_i equals one if a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. $Post_t$ equals one after the deregulation announcement, i.e. Q4-1996 and later, and zero otherwise. The sample period is six years from 1994-1999. The regression include time-varying firm-level controls, $ln(totalassets)_{it-1}$, $tangibility_{it-1}$, $profitability_{it-1}$, $leverage_{it-1}$, $market\ to\ book_{it-1}$, all lagged by one period. All variables are defined in the appendix. The regressions include firm fixed effects, quarter fixed effects, state-quarter fixed effects, industry-quarter fixed effects and state-industry-quarter fixed effects, where indicated. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table A4: Effect of bank scope on loan issuance: Pr(Loan Issuance)

	(1)	(2)	(3)	(4)
Post x UB	-0.0090***	-0.0087***	-0.0097***	-0.0103**
	(-3.22)	(-2.97)	(-3.02)	(-2.05)
UB	0.0104***			
	(4.73)			
Post	0.0022			
	(1.10)			
Controls	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes
Quarter FE	No	Yes	No	No
State-Quarter FE	No	No	Yes	No
Industry-Quarter FE	No	No	Yes	No
State-Industry-Quarter FE	No	No	No	Yes
Observations	53,604	53,602	52,772	30,577
Adj. R^2	0.005	0.031	0.038	0.055

This table reports the results from the estimation of a pooled panel regression analyzing the effect of bank scope on bank term loan debt financing. The unit of observation is the firm-quarter level. The dependent variable is $Termloans/Assets_{it}$. The treatment group indicator UB_i equals one if a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. $Post_t$ equals one after the deregulation announcement, i.e. Q4-1996 and later, and zero otherwise. The sample period is six years from 1994-1999. The regression include time-varying firm-level controls, $ln(totalassets)_{it-1}$, $tangibility_{it-1}$, $profitability_{it-1}$, $leverage_{it-1}$, $market\ to\ book_{it-1}$, all lagged by one period. All variables are defined in the appendix. The regressions include firm fixed effects, quarter fixed effects, state-quarter fixed effects, industry-quarter fixed effects and state-industry-quarter fixed effects, where indicated. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table A5: Effect of bank scope on bond issuance: until 1998-Q2

	(1)	(2)	(3)	(4)
Post x UB	0.0720***	0.0781***	0.0761***	0.0654**
	(3.62)	(3.79)	(3.31)	(2.16)
UB	-0.0173			
	(-1.12)			
Post	0.0104			
	(0.90)			
Controls	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes
Quarter FE	No	Yes	No	No
State-Quarter FE	No	No	Yes	No
Industry-Quarter FE	No	No	Yes	No
State-Industry-Quarter FE	No	No	No	Yes
Observations	41,432	41,424	40,814	23,938
Adj. R^2	0.085	0.200	0.203	0.197

This table reports the results from the estimation of a pooled panel regression analyzing the effect of bank scope on bank term loan debt financing. The unit of observation is the firm-quarter level. The dependent variable is $Termloans/Assets_{it}$. The treatment group indicator UB_i equals one if a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. $Post_t$ equals one after the deregulation announcement, i.e. Q4-1996 and later, and zero otherwise. The sample period starts in 1994, but ends in Q2-1998. The regression include time-varying firm-level controls, $ln(totalassets)_{it-1}$, $tangibility_{it-1}$, $profitability_{it-1}$, $leverage_{it-1}$, $market\ to\ book_{it-1}$, all lagged by one period. All variables are defined in the appendix. The regressions include firm fixed effects, quarter fixed effects, state-quarter fixed effects, industry-quarter fixed effects and state-industry-quarter fixed effects, where indicated. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table A6: Effect of bank scope on loan issuance: until 1998-Q2

	(1)	(2)	(3)	(4)
Post x UB	-0.0243*	-0.0191	-0.0316**	-0.0368*
	(-1.80)	(-1.38)	(-2.06)	(-1.70)
UB	0.0362***			
	(4.20)			
Post	0.0202**			
	(2.22)			
Controls	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes
Quarter FE	No	Yes	No	No
State-Quarter FE	No	No	Yes	No
Industry-Quarter FE	No	No	Yes	No
State-Industry-Quarter FE	No	No	No	Yes
Observations	41,432	41,424	40,814	23,938
Adj. R^2	0.010	0.052	0.053	0.070

This table reports the results from the estimation of a pooled panel regression analyzing the effect of bank scope on bank term loan debt financing. The unit of observation is the firm-quarter level. The dependent variable is $Termloans/Assets_{it}$. The treatment group indicator UB_i equals one if a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. $Post_t$ equals one after the deregulation announcement, i.e. Q4-1996 and later, and zero otherwise. The sample period starts in 1994, but ends in Q2-1998. The regression include time-varying firm-level controls, $ln(totalassets)_{it-1}$, $tangibility_{it-1}$, $profitability_{it-1}$, $leverage_{it-1}$, $market\ to\ book_{it-1}$, all lagged by one period. All variables are defined in the appendix. The regressions include firm fixed effects, quarter fixed effects, state-quarter fixed effects, industry-quarter fixed effects and state-industry-quarter fixed effects, where indicated. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table A7: Bond issuance:: (window +/- 4 quarters)

	(1)	(2)	(3)	(4)
Post x UB	0.0702***	0.0735***	0.0684**	0.0733*
	(3.07)	(3.15)	(2.57)	(1.92)
UB	-0.0228			
	(-1.14)			
Post	-0.0207			
	(-1.51)			
Controls	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes
Quarter FE	No	Yes	No	No
State-Quarter FE	No	No	Yes	No
Industry-Quarter FE	No	No	Yes	No
State-Industry-Quarter FE	No	No	No	Yes
Observations	21,709	21,696	21,405	12,673
Adj. R^2	0.082	0.223	0.211	0.189

This table reports the results from the estimation of a pooled panel regression analyzing the effect of bank scope on bank term loan debt financing. The unit of observation is the firm-quarter level. The dependent variable is $Termloans/Assets_{it}$. The treatment group indicator UB_i equals one if a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. $Post_t$ equals one after the deregulation announcement, i.e. Q4-1996 and later, and zero otherwise. The sample period is 8 quarters arround the deregulation, i.e. from Q3-1995 to Q3-1997. The regression include time-varying firm-level controls, $ln(totalassets)_{it-1}$, $tangibility_{it-1}$, $profitability_{it-1}$, $leverage_{it-1}$, $market\ to\ book_{it-1}$, all lagged by one period. All variables are defined in the appendix. The regressions include firm fixed effects, quarter fixed effects, state-quarter fixed effects, industry-quarter fixed effects and state-industry-quarter fixed effects, where indicated. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table A8: Loan issuance: (window +/- 4 quarters)

	(1)	(2)	(3)	(4)
Post x UB	-0.0214	-0.0159	-0.0267	-0.0238
	(-1.23)	(-0.91)	(-1.44)	(-0.92)
UB	0.0333***			
	(2.83)			
Post	0.0076			
	(0.67)			
Controls	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes
Quarter FE	No	Yes	No	No
State-Quarter FE	No	No	Yes	No
Industry-Quarter FE	No	No	Yes	No
State-Industry-Quarter FE	No	No	No	Yes
Observations	21,709	21,696	21,405	12,673
Adj. R^2	0.009	0.056	0.054	0.054

This table reports the results from the estimation of a pooled panel regression analyzing the effect of bank scope on bank term loan debt financing. The unit of observation is the firm-quarter level. The dependent variable is $Termloans/Assets_{it}$. The treatment group indicator UB_i equals one if a firm has a lending relationship with a universal bank, and zero if its lending relationship is with a commercial bank. $Post_t$ equals one after the deregulation announcement, i.e. Q4-1996 and later, and zero otherwise. The sample period is 8 quarters arround the deregulation, i.e. from Q3-1995 to Q3-1997. The regression include time-varying firm-level controls, $ln(totalassets)_{it-1}$, $tangibility_{it-1}$, $profitability_{it-1}$, $leverage_{it-1}$, $market\ to\ book_{it-1}$, all lagged by one period. All variables are defined in the appendix. The regressions include firm fixed effects, quarter fixed effects, state-quarter fixed effects, industry-quarter fixed effects and state-industry-quarter fixed effects, where indicated. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.

Table A9: Bank Loan Supply: by Bank Size

	(1) large (LO)	(2) large (TA)	(3) small (LO)	(4) small (TA)
Post x UB	0.0907	0.0323	0.2529*	0.2698**
	(1.49)	(0.68)	(1.85)	(2.70)
Firm-Year FE	Yes	Yes	Yes	Yes
Firm-Bank FE	Yes	Yes	Yes	Yes
Observations	8,646	8,376	570	1,062
Adj. R^2	-0.195	-0.190	-0.293	-0.394

This table reports the results of difference-in-differences regression analyzing probability of loan issuances before versus after the deregulation. The estimates in column (1) and (2) exclude banks in the lowest tercile of (syndicated) loan origination activity ("LO") and total assets ("TA"), respectively. The estimates in column (3) and (4) exclude banks in the highest tercile loan origination and total assets, respectively. The analysis is based on data on the borrower-bank-time level where loans are aggregated at an annual level. The dependent variable pr(Loan) is an indicator variable that equals one if firm i receives a loan in period t from bank j (as lead arranger), and zero otherwise. The value of total assets is taken in 1993, i.e. before the begin of the sample period. The value of loan origination is the average of the pre-deregulation sample period, i.e. Q1-1994 to Q3-1996. The treatment group indicator UB equals one for banks that had a section 20 subsidiary at or before the announcement. $Post_t$ equals one in 1997 and later. All variables are defined in the appendix. The regressions include firm fixed-year effects and bank-firm fixed effects. t-statistics based on robust standard errors clustered at the firm-level are are reported in parentheses. ***, **, * denote significance at the 1, 5, and 10 %-level, respectively.