Francis, Bill; Hasan, Iftekhar; Wu, Qiang

Working Paper

The impact of CFO gender on bank loan contracting

Bank of Finland Research Discussion Papers, No. 18/2011

Provided in Cooperation with:
Bank of Finland, Helsinki

Suggested Citation: Francis, Bill; Hasan, Iftekhar; Wu, Qiang (2011) : The impact of CFO gender on bank loan contracting, Bank of Finland Research Discussion Papers, No. 18/2011, ISBN 978-952-462-774-0, Bank of Finland, Helsinki, https://nbn-resolving.de/urn:nbn:fi:bof-20140807359

This Version is available at:
https://hdl.handle.net/10419/212197

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Suomen Pankki
Bank of Finland
PO Box 160
FI-00101 HELSINKI
Finland
☎ +358 10 8311

http://www.suomenpankki.fi/en
E-mail: Research@bof.fi

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Bill Francis* – Iftekhar Hasan** – Qiang Wu***

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* Lally School of Management, Rensselaer Polytechnic Institute, Troy, NY, 12180, USA.
** Lally School of Management, Rensselaer Polytechnic Institute, Troy, NY, 12180, USA and Bank of Finland, FI 00101, Helsinki, Finland. Corresponding author.
*** Lally School of Management, Rensselaer Polytechnic Institute, Troy, NY, 12180, USA.

http://www.suomenpankki.fi/en

ISBN 978-952-462-773-3
ISSN 0785-3572
(print)

ISBN 978-952-462-774-0
ISSN 1456-6184
(online)

Helsinki 2011

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Bank of Finland Research
Discussion Papers 18/2011

Bill Francis – Iftekhar Hasan − Qiang Wu
Monetary Policy and Research Department

Abstract

Motivated by recent studies that show female CFOs are more risk averse than male CFOs when making various corporate decisions, we examine whether banks take into consideration the gender of CFOs when pricing bank loans. We find that in our sample, firms under the control of female CFOs on average enjoy about 11% lower bank loan price than firms under the control of male CFOs. In addition, loans given to female CFO-led companies have longer maturities and are less likely to be required to provide collateral than loans given to male CFO led companies. Our results are robust to a series of robustness tests, such as a firm and year-fixed effect regression, a Heckman two-stage self selection model, a propensity score match method and a differences-in-differences approach. Overall, our results suggest that banks tend to recognize the role of female CFOs in providing more reliable accounting information ex ante and reducing default risk ex post, and grant firms with female CFOs lower loan price and more favourable contract terms.

Keywords: CFOs, gender, accounting information, bank loans

JEL classification numbers: M41, G21, J16

Vaikuttaako yrityksen rahoitusjohtajan sukupuoli pankkiluottojen ehtoihin?

Suomen Pankin keskustelualoitteita 18/2011

Bill Francis – Iftekhar Hasan − Qiang Wu
Rahapolitiikka- ja tutkimusosasto

Tiivistelmä

Tuoreiden tutkimusten mukaan naispuoliset yritysten rahoitusjohtajat kaihtavat päätöksenteossaan riskejä enemmän kuin miespuoliset rahoitusjohtajat. Tässä tutkimuksessa otetaan nämä tulokset lähtökohdaksi ja haetaan empiiristä näyttöä oletukselle, että pankkilainaa hakevan yrityksen rahoitusjohtajan sukupuoli vaikuttaa pankkilainan ehtoihin, erityisesti lainan hintaan. Tutkimuksessa käytetystä otoksesta saatujen estimointitulosten mukaan yritys, jonka rahoitusjohtaja on nainen, saa pankilta lainaa keskimäärin 11 % halvemmalla kuin yritys, jonka rahoituspäätöksistä vastaa mies. Pankkien myöntämien yrityslainojen maturiteetti lisäksi pitenee ja lainoille vaaditaan todennäköisesti vähemmän vakuuksia, kun yrityksen rahoitusjohtaja on nainen. Estimointitulosten murtumispisteitä etsitään vaihtoehtoisilla tilastollisilla testeillä ja estimointimenetelmillä. Estimoituun malliin otetaan yhtäältä mukaan yritys- ja vuositason kiinteät vaikutukset. Toisaalta työssä testataan Heckmanin kaksivaiheisen menetelmän avulla valikointiharhan merkitystä estimointitulosten kannalta. Lisäksi malli estimoidaan myös kahdella muulla menetelmällä: ”prospensity scrore matching” sekä ”difference-in-difference”. Tutkimustuloksia voidaan kaiken kaikkiaan tulkita niin, että pankit luottavat enemmän naispuolisten rahoitusjohtajien antamaan etukäteistietoon yrityksen tuloksesta ja uskovat naisjohtajan pienentävän luottojen takaisinmaksuun liittyviä riskejä. Pankit ovat näin ollen valmiita myöntämään luottoa edullisemmin ehdoin niille yrityksille, joiden rahoitusjohtaja on nainen.

Avainsanat: rahoitusjohtaja, sukupuoli, kirjanpitoinformaatio, pankkiluotot

JEL-luokittelu: M41, G21, J16

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1. Introduction

Over the past decade, the number of female CFOs has increased dramatically. For example, the total number of female CFOs in S&P 1,500 companies was only 4 in 1994, and it was 104 in 2006. [1] This significant increase of female CFOs has attracted considerable attention from academics. An emerging stream of literature begins to investigate the systematic differences between male and female CFOs in terms of their accounting, financing and investment decision-making. For instance, prior studies find that firms with female CFOs adopt more conservative accounting policies (Francis et al. (2010)), report higher quality earnings (Peni (2008)), are less likely to manipulate earnings (Wei and Xie (2009) and Chava and Purnanandam (2010)), and are less likely to make significant acquisitions and more likely to reduce leverage level than firms with male CFOs (Huang and Kisgen (2010)). In this paper, we extend this line of research by examining whether the gender of CFOs affects the cost of debt capital in the context of bank loans.

We focus on bank loans for two primary reasons. First, bank loans are a major source of corporate financing, even for large public companies. Each year, the sheer volume of bank loan financing is much larger than equity and bond financing.[2] Given the economic significance of bank loans in allocating capital to corporations as well as the growing number of female CFOs, it is very important to understand whether the gender of CFOs affects the cost of bank loans.

[1] Data source: ExecuComp.

[2] For example, according to the Loan Pricing Association and Federal Reserve System, in 2005 the total amount of equity issuance was about 115 billion U.S. dollars and the total amount of corporate bond issuance was about 700 billion, while the total amount of bank loan issuance was 1,500 billion U.S. dollars.

Second, accounting information is a persistent standard that banks rely on to assess borrowers' credit risk (e.g., Anderson et al. (2004) and Armstrong et al. (2010)). Prior studies find that when banks initiate private debt, they are very sensitive to various attributes of accounting information, such as operating accrual (Bharath et al. (2008)) and conservatism (Sunder et al. (2009) and Zhang (2008)). Assuming female CFOs are more likely to report high quality and conservative earnings than male CFOs as documented in prior studies, as inside lenders with in-depth knowledge of their clients (e.g., Diamond (1984) and Fama (1985)), banks should realize the benefits of female CFOs in providing more reliable and conservative accounting information to lenders. In addition, the incentives of female CFOs to reduce firms' leverage level and make less risky investments also indicate lower default risk of the firms (Strahan (1999)). Collectively, we conjecture that banks should consider the gender effect and reward borrowers with female CFOs with lower bank loan price and more favorable non-price loan terms when designing bank loan contracts.

However, there is a long existing literature shows that females are discriminated in the credit market. The discrimination hypothesis simply implies that banks charge higher loan price and require tighter non-price terms when lending to female led companies because they are biased against women. Empirically, most studies focus on small business firms and their results are mixed (e.g., Blanchflower et al. (2003), Storey (2004) and Alesina et al. (2008)).

We empirically examine this question. Using a sample of S&P 1,500 companies from 1994-2006, we estimate how loan spread, loan maturity and loan collateral are

affected by the gender of CFOs. Following previous studies, we control for firm characteristics and loan characteristics that are likely to shape loan contract terms.

We find that gender of CFOs do affect bank loan contracts. Specifically, we find that in our sample, firms with female CFOs, on average, enjoy about 14 basis points lower bank loan price than firms with male CFOs. In addition, loans given to female CFO led companies have 9% (3.8 months) longer maturities and are about 8% less likely to be required to provide collateral than loans given to male CFO led companies. The results support the hypothesis that banks tend to recognize the role of female CFOs in reducing information risk ex ante and default risk ex post, and reward firms with female CFOs more favorable loan contract terms.

We also test whether female CEOs and other female top executives affect bank loan price. However, we do not find that the presence of female CEOs and other female top executives affect both price and non-price loan terms considered in our paper. The results suggest that banks view CFOs, but not CEOs or other executives, as the primary executives who determine the quality of accounting information and the financing decisions of the firms, and in turns, affect their lending decisions. The results are also consistent with recent studies that find a strong relation between CFOs and the quality of accounting information and the leverage level of the firms (e.g., Geiger and North (2006), Matsunaga and Yeung (2007), Peni (2008), Huang and Kisgen (2010), Chava and Purnanandam (2010) and Jiang et al. (2010)).

Endogeneity is a big concern in the study of gender issue. For instance, Female CFOs may not be randomly assigned to firms. Firms having more favorable credit terms may be more likely to hire female CFOs. In addition, unobservable time-variant or

invariant factors may be correlated with bank loans. Further, the causality problem makes our results hard to interpret. To address the issue of potential endogeneity, we employ a series of econometric analysis. First, we use a firm and year fixed effect regression to rule out the impact of potential unobservable time-invariant firm specific effects. Second, we use a Heckman two-stage model to control for self-section bias. Third, we apply a matching sample approach based on propensity score match method to control for sample selection bias. Finally, similar to Francis et al. (2010), we trace firms who change their CFOs from male to female (treated group) and from male to male (control group) and apply a differences-in-differences approach to mitigate unobservable time variant factors which could affect the estimated influence of female CFOs. Our results are all robust, regardless of the econometric methods that we apply. The results of the differences-in-differences approach also indicate that female CFOs bring about, and not merely reflect, a reduced bank loan price and more favorable non-price loan terms.

Our research is related to the literature on the relation between accounting information and bank loan contracting. For example, recent studies find that bank loan contract terms are affected by accrual quality (Bharath et al. (2008)), conservatism (Sunder et al. (2009)), debt-contracting value of accounting information (Ball et al. (2008)), internal control weakness (Schneider and Church (2008), financial restatements (Graham et al. (2008)) and earnings predictability (Park and Wu (2010)). In this paper, rather than focus on firm-level factors, we firstly relate bank lending decisions to the gender of top executives of borrowers and provide evidence that gender of CFOs also has a significant impact on bank loan contracting, thereby furthering our understanding of its determinants.

Our paper also contributes to the gender literature. Despite the proliferation of studies, there is still much debate as to the systematic differences between men and women with regard to their risk attitudes (e.g., Atkinson et al. (2003) and Dwyer et al. (2002)). In this paper, by examining how informed private lenders, who are supposed to be very sensitive to the risk attitudes of top executives, react to the gender of CFOs when designing bank loan contracts, we can gain new insight into whether there exits systematic differences between male and female CFOs from sophisticated investors' perspective. In addition, in our research design, we comprehensively use different econometric methods to mitigate the potential endogeneity concern.

The rest of the paper is structured as follows. Section 2 reviews related literature and develops our hypotheses. Section 3 presents sample selection, summary statistics and univariate comparisons. The results of multivariate tests are in Section 4. The final section provides conclusions.

2. Related literature and hypothesis development

Gender differences in attitudes towards risk and in risk related behavior have long been studied in the sociology, psychology and economics literatures.[3] In general, most studies support the notion that women are more risk averse than men. Because of the dramatic increase of female executives on top management teams over the past decade, more and more studies begin to investigate whether the gender of top executives affects various corporate decisions. For example, Huang and Kingen (2010) investigate how gender of CFOs affects corporate financial decisions. They find that firms under the control of female CFOs are less likely to make significant acquisitions and are less likely

[3] For a survey of gender difference in risk attitude in economic literature, see Eckel and Grossman (2003).

to issue long term debt. Furthermore, female CFOs are more likely to reduce leverage level than male CFOs. They also test market reactions to acquisitions and find that acquisitions made by female CFOs exhibit higher announcement returns compared to those made by firms with male CFOs. Their results provide some supportive evidence that female CFOs are more risk-averse than male CFOs when making their financial decisions.

Francis et al. (2010) examine the impact of gender of CFOs on accounting decision-making. By focusing on accounting conservatism, they find that female CFOs tend to report more conservative accounting numbers than their counterparts. They also examine the linkage between risk aversion of female CFOs and corporate decision making. They find that female CFOs make less risky financing and investment decisions compared to their counterparts. Peni (2008) test the relation between earnings quality and the gender of top executives. She finds that the gender of CFOs, but not CEOs or other executives affect earnings quality. Using a sample of listed Chinese firms, Wei and Xie (2009) find that female CFOs are less likely to manipulate earnings than male CFOs.

In the bank loan literature, the default risk is the primary determinant of bank loan price, and banks always rely on accounting information to assess the default risk of their borrowers, as accounting information is the primary resource for banks to evaluate and predict riskiness of borrowers. Prior studies find a negative relation between bank loan price and earnings quality (Bharath et al. (2008)) and conservatism (Zhang (2008)). In addition, the capital structure decisions and acquisition decisions directly related to the default risk of the firms. Prior studies find firms with higher leverage level and firms with higher takeover vulnerability have higher bank loan price (e.g., Strahan (1999) and Chava

et al. (2009)). Assuming female CFOs tend to report higher quality and more conservative earnings than male CFOs, as inside lenders and delegated monitors who concern about earnings quality and default risk of their borrowers (e.g., Diamond (1984) and Fama (1985)), banks should recognize the gender differences of CFOs with regard to their accounting and financing decision-making, and reward firms with female CFOs with lower bank loan price than firms with male CFOs.

H1: All else being equal, firms under the control of female CFOs have lower bank loan price than firms under the control of male CFOs

Bank loan contracts have multiple terms and they cannot be treated separately (Melnik and Plaut (1986)). In addition, while interest rates are an effective way to "price" the risk of bank loans, they have adverse effects on the moral hazard problem of borrowers (Stiglitz and Weiss (1981)). In reality, banks are more likely to set up customized contracts not only on price, but also on non-price loan terms to price risk, facilitate monitoring and limit potential losses. Therefore, it is important to focus on both price and non-price terms when studying bank loan contracts (Qian and Strahan (2007)).

Among different loan contract terms, loan maturity and collateral are important non-price terms which are widely used by banks to limit downside risk of lenders. For example, Barclay and Smith (1995) and Rajan and Winton (1995) argue that shorter maturities is a useful way to solve information problems because they can force more frequent information disclosure and timely renegotiation of contract terms. Berger and Udell (1990) and Jimenez et al (2006) show that lenders are more likely to use collateral

when borrowers have higher information risk. Rajan and Winton (1995) discuss how the use of collateral affects banks' incentives to monitor borrowers. As we expect that female CFOs affect both information risk ex ante and default risk ex post, we expect that firms with female CFOs should enjoy longer maturities and are less likely to be required to provide collateral in bank loan contracts.

H2: All else being equal, firms under the control of female CFOs have longer loan maturities in bank loan contracts than firms under the control of male CFOs

H3: All else being equal, firms under the control of female CFOs are less likely to be required to provide collateral in bank loan contracts than firms under the control of male CFOs

3. Data

3.1 Sample selection

The gender information is from ExecuComp database which covers most S&P 1,500 public companies. S&P 1,500 includes S&P 500, S&P Midcap 400, and S&P SmallCap 600.[4] The bank loan information is from the LPC Dealscan database, which contains historical bank loan data that are compiled from the SEC filings, self-reporting by banks and its staff reporters. The basic unit of loans is facility, which is the fundamental security that designates a loan in the loan market. The LPC Dealscan database includes detailed deal terms and conditions of loans, such as the interest rate,

[4] S&P 1,500 public companies cover about 85% of the US equities market.

loan size, maturity and collateral. Beyond these loan contract terms, Dealscan also includes information on the types of loans and the purposes of loans.

The accounting information is from the Compustat database. Following prior studies, we exclude financial and utility companies. After merging the various data sources, the final sample contains 9,680 facility/year observations obtained by 1,296 firms from 1994 to 2006. [5]

3.2 Descriptive statistics

Table 1 provides descriptive statistics of the key variables in our study. We find that the mean values of female CFOs, female CEOs and other female executives are 0.049, 0.022 and 0.223, respectively. These numbers show that the number of female CFOs is more than twice as the number of female CEOs. Although the total number of female executives counts for over one fifth of top executive members, the proportions of female CEOs and female CFOs are still relatively low.

[Insert Table 1 here]

With regard to bank loan characteristics, we find that the average loan spread is 128 basis points, ranging from 8 basis points to 1,180 basis points. In our sample, the average loan amount is 774 million with the mean maturity of 42 months. The loan amount and maturity vary considerably across our sample. We also find that about 70%

[5] Year 1992 and year 1993 are dropped because there is no female CFO in these two years in ExecuComp data.

of loans use collateral (security) in our sample. The results of loan variables are very similar to those of Chava et al. (2009) and Francis et al. (2009).

Table 1 also shows that the average value of assets for our sample borrowers is 9,955 million, ranging from a minimum of 14 million to a maximum of 750,507 million. The average market leverage ratio is 0.289, the average tangibility is 0.342, the average profitability is 0.139 and the average Z-score is 1.787. All of these firm variables also vary across our sample.

Table 2 provides the Spearman pair-wise correlations among the key variables. We find that female CFOs are significantly negatively correlated with bank loan spread and security, and are significantly positively correlated with bank loan maturity. The results provide some preliminary evidence about the effect of female CFOs on bank loan contracts. However, because those loan terms are also significantly correlated with many other loan and firm variables, it suggests that we need to analyze the relation in a multivariate environment.

[Insert Table 2 here]

Table 2 also shows that female CEOs, female CFOs and other female executives are all significantly positively correlated, suggesting firms with female CEOs are more likely to hire female executives on the top management teams. The result seems consistent with the similarity attraction principle (Westphal and Zajac (1995)), which says that the appointment as a company executive is influenced by the individuals' similarity to the existing members of the executives.

3.3 Univariate Comparisons

Table 3 provides univariate comparisons of price and non price loan terms between firms with female CFOs and firms without female CFOs. Consistent with our hypothesis, we find that the mean of bank loan spread for firms with female CFOs is 107 basis points, while it is 129 basis points for firms without female CFOs. The mean difference of 22 basis points is significant at the 1% level. We also find that the means of loan maturity and loan security are both significantly different between firms with female CFOs and firms without female CFOs. On average, loans for borrowers with female CFOs are less likely to be secured and have longer maturities than loans for borrowers with male CFOs.

[Insert Table 3 here]

While the univariate tests provide some evidence to support our hypotheses, the results do not take into consideration potentially fundamental differences in borrower characteristics and other loan characteristics between these two groups. Therefore, we also compare the borrower characteristics, loan types and loan purposes between these two samples. We find that on average, firms with female CFOs have higher profitability, higher market to book ratio, but lower leverage ratio than firms with male CFOs. The results are consistent with prior findings, such as Huang and Kisgen (2010) and Francis et al. (2010).

In terms of loan types, we do not find significant differences between these two sample firms. For loan purposes, we find that loans for firms without female CFOs are more likely to be used for debt repay, recapitalization and takeover, and are less likely to be used for general corporate purpose compare to firms with female CFOs.

In sum, the results of univariate tests suggest that banks provide more favorable loan terms to borrowers with female CFOs. The results also show that some key borrower characteristics and loan characteristics that may affect bank loans are significantly different across sub-samples, which suggest the need of controlling for those key firm and loan characteristics in the multivariate analysis.

4. Results of multivariate tests

In our multivariate regression tests, we begin by testing how female CFOs affect bank loan price. Next, we examine how female CFOs affect non-price loan terms. Further, we conduct a series of robust checks by using different statistical methods, including a Heckman two-stage approach, a propensity score match approach, a differences-in-differences approach and a firm level analysis. Finally, we explore through which channels female CFOs affect bank loan contracting by examining how female CFOs affect major firm characteristics.

4.1 Female CFOs and bank loan price

We first test how the presence of female CFOs impact bank loan price. The main empirical model follows:

Log (Loan spread) = f (Female CFOs, Firm characteristics, Loan characteristics, Industry effects, Year effects) *(1)*

In the regression, the basic unit of observation is the loan facility, and the dependent variable is the natural logarithm of the *Loan spread*. To capture the effect of gender of CFOs, we defines a dummy variable, *Female CFOs*, which is equal to one if the loan is initiated to a firm with female CFOs, and zero otherwise.

Following prior studies, such as those by Qian and Strahan (2007), Bharath et al. (2008), Graham et al. (2008) and Francis et al. (2009), we control for several firm characteristics that may affect the loan price in the regressions. Those factors include *Log (assets)*, which is the natural logarithm of a firm's total assets; *Leverage*, which is the total debt (long term debt plus debt in current liabilities) divided by the total market assets (total debt plus total market value of equity); *Profitability*, which is the EBITDA divided by the total assets; *Tangibility*, which is the net property, plant and equipment divided by the total assets; *M/B*, which is the market value of equity plus the book value of debt divided by the total assets; and *Z-score*, which is the modified Altman's Z-score.[6] Further, we employ one-digit SIC dummies to control for the potential differences in loan pricing across industries.[7]

We further control for loan characteristics that may affect loan contracting in the regressions. We include *Log (facility)*, the natural logarithm of the amount of a loan facility, to measure loan size. Sharpe (1990) and Rajan (1992) emphasize lock-up

[6] Following Graham et al. (2008), we use a modified Z-score, which does not include the ratio of the market value of equity to the book value of the total debt, because a similar term, market-to-book, is included in the regressions.
[7] Using two-digit SIC codes yields similar results.

problems associated with the existing lending relationship that subsequently increase borrowing costs. To control for previous lending relationships, we construct a variable *Prior relations*, which is the total number of previous loans established by the same borrower and the same lead lender in the Dealscan database. Following Qian and Strahan (2007), we construct a loan rating score based on Moody's rating unless it is missing, in which case we use the S&P rating. *Debt rating* is a score that ranges from one to seven, with one indicating an Aaa rating, two indicating an Aa rating, three indicating an A rating, four indicating a Bbb rating, five indicating a Bb rating, six indicating a B rating or worse, and seven indicting no or missing debt rating. We also control for both the loan type effect and the loan purpose effect in our analysis. Following Francis et al. (2009), we separate loan types into six categories: 364-day facility, Revolver less than one year, Revolver more than one year, Revolver/Term loan, Term loan and others. For loan purposes, we separate loans into eleven groups: Acquisition lines, CP backup, Corporate purpose, Debt repay, LBO/MBO, Recapitalization, Spinoff, Stock buyback, Takeover, Working capital and Others.

As the number of female CFOs has increased dramatically since 1994, one concern is that our sample of female CFOs is heavily weighted to the latter part of the sample. For example, there are 330 female CFO observations in the 2002 to 2006 period while there are 144 female CFO observations in the 1994 to 2001 period. In addition, the average treasury rate is significantly different between the 1994 to 2001 period and the 2002 to 2006 period, suggesting different macro-level borrowing environments between these two periods. To mitigate this concern, we first add year dummy to control for year effect. Second, we add a dummy for the 2002 to 2006 period. Third, we construct a

dummy variable called *High treasury rate*, which equals one if a loan is created on a day when the one year treasury rate is above the median rate for the entire sample period, and zero otherwise. [8]

[Insert Table 4 here]

In Column 1 of Table 4, we first test how the presence of female CFOs affects bank loan price by using an OLS regression. The estimated coefficient of *Female CFOs* equals -0.108 and is significant at the 1% level, indicating firms with female CFOs, on average, have about 11% (about 14 basis points) lower bank loan price than firms with male CFOs. Therefore, the effect of female CFOs on bank loan price is economically and statistically significant.

In terms of control variables, our results are consistent with prior studies such as Qian and Strahan (2007), Bharath et al. (2008), Graham et al. (2008) and Francis et al. (2009). Specifically, we find that *Log (assets)*, *Tangibility*, *Profitability*, *M/B* and *Z-score* are all significantly negatively related to the loan spread, while *Leverage* is positively related to the loan spread, suggesting firms with higher information asymmetries and default risk have higher loan price. We also find that *Log (facility)* is negatively, while *Prior relations* and *Debt rating* are positively related to the loan spread.

In previous OLS regression, although we control for various observable firm and loan characteristics which are widely used in prior studies, it is still possible that unobservable time-invariant factors could affect bank loan price. In addition, it is common that a firm have several loan facilities each year, and those facilities may not be

[8] We thank the referee for pointing this out to us.

independent. Treating those correlated loans independently may overstate the statistical significance and lead to biased results. To deal with these two issues, we perform a firm and year fixed regression with standard errors adjusted for heteroscedasticity and within-firm clustering. The results are in Column 2 of Table 4. We find after controlling for firm and year fixed effects, the *Female CFOs* effect on bank loan price increases to 0.156 from 0.108 (in Column 1), and it remains economically and statistically significant.

As CEOs have the overall responsibilities of corporate decision-making, and prior studies find that CEOs' individual styles affects firm policies and firm performance (e.g., Levi et al. (2008), Bertrand and Schoar (2003) and Bennedsen et al. (2006)), gender of CEOs may also affect lender's perceptions in their lending decisions. In Column 3 of Table 4, we further test whether the presence of female CEOs affects bank loan price. The results show that there is no significant relation between these two, indicating banks do not take consideration of the gender of CEOs when pricing bank loans. The result is consistent with prior studies, such as Peni (2008) and Jiang et al. (2010), which show that CFOs have more impacts on earnings quality and earnings management than CEOs.

We further test whether the presence of other female top executives affects bank loan price. The results in Column 4 of Table 4 show that other female top executives are not related to bank loan price significantly. In Column 5 of Table 4, we specify three testing variables, *Female CFOs*, *Female CEOs* and *Female other top executives*, in one regression simultaneously. The results further confirm that only *Female CFOs* is significantly negatively related to bank loan price, and both *Female CEOs* and *Female other top executives* have no impacts on bank loan price.[9]

[9] We test whether multicollinearity problems exist for all the regressions presented in this section. We find all the variance inflation factors (VIF) are far below the threshold indicator of 10. For example, the highest

As we said before, the number of female CFO observations in the 2002 to 2006 period is larger than that in the 1994 to 2001 period, and the borrowing environments are different between these two periods. Therefore, we further examine whether the CFO gender effect on bank loan price holds for both sample periods. We separate our sample into two subsamples bases on the time periods, and then rerun firm and year fixed effect regressions for these two sub samples separately. The results are reported in Column 6 and Column 7 of Table 4. We find that CFO gender effect on bank loan price holds for both subsamples, although the magnitudes of the coefficient for the 2002 to 2006 period sample is higher than that for the 1994 to 2001 period sample. [10]

In sum, the results in Table 4 support the hypothesis that banks tend to recognize benefits of female CFOs in providing more reliable accounting information ex ante and reducing default risk ex post, and grant firms with female CFOs lower bank loan price. The results also suggest that banks only concern the gender of CFOs, but not CEOs or other top executives when making their lending decisions.

4.2 Female CFOs, loan maturity and loan collateral

If female CFOs convey information about disclosure quality and default risk of the firms, lenders might consider this factor not only on loan price, but also on other contract terms. Similar to Bharath et al. (2008), in this section, we focus on how female CFOs impact two major non-price loan contract features: loan maturity and loan collateral.

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variance inflation factor (VIF) for model 1 of Table 4 is 3.01 (log assets), and the VIF for female CFOs is only 1.03. So it seems that multicollinearity is not a big issue in our multivariate analysis.

[10] The coefficients of female CFOs for the two subsamples are not significantly different.

[Insert Table 5 here]

Column 1 of Table 5 reports the results on the impact of female CFOs on loan maturity. The dependent variable is the natural logarithm of the *Loan maturity*. Consistent with our Hypothesis 2, we find that the estimated coefficient of *Female CFOs* is 0.090 and is significant at the 1% level, indicating that loans given to firms with female CFOs have about 9% (3.8 months) longer maturities than loans given to firms with male CFOs. We also find that *Female CEOs* and *Other female executives* have no impact on loan maturity. In Column 2, we run firm and year fixed effect regression. Again we find that the estimated coefficient of female CFOs is still economically and statistically significant.

We further test the impact of female CFOs on the likelihood of a loan being secured. We estimate a logit model where the dependent variable is one if a loan is secured and zero otherwise.[11] The results are in Column 3 of Table 5. The marginal effect of *Female CFOs* implies that the probability of a loan being secured is about 8% lower for firms with female CFOs than for firms with male CFOs. [12] This is consistent with our hypothesis that because of the information risk and default risk is lower in female CFO led firms than in male CFO led firms, banks are less likely to require collateral in loan contracts when lending to female CFO led firms. In addition, we still do not find significant impacts of *Female CEOs* and *Other female executives* on the likelihood of a loan being secured.

[11] Because there are many missing observations about loan secured in Dealscan, the sample size for loan secured is smaller than other loan variables.
[12] The Female CFOs dummy coefficient of 0.389 translates into a 0.0775 marginal effect in the logit model.

In sum, the results in Table 5 indicate that the firms with female CFOs enjoy more favorable non-price loan terms than firms with male CFOs, which is consistent with the literature that shows banks always simultaneously use both price and non-price terms to compensate for higher risk, facilitate monitoring and limit potential losses (e.g., Qian and Strahan (2007), Bharath et al. (2008), Graham et al. (2008) and Francis et al. (2009)). The results on the gender of CEOs and other top executives also confirm that banks only consider the gender of CFOs, but not CEOs or other top executives, when designing bank loan contracts.

4.3 Robustness checks

So far, we find that firms with female CFOs enjoy more favorable loan contract terms. However, endogeneity is a big concern in the study of gender issue. In this section, we perform robustness checks using different econometric analysis.

The first issue is the self selection bias. Female CFOs may not be randomly assigned to firms. Firms having more favorable credit terms may be more likely to hire female CFOs. Therefore, a proper evaluation of the effect of female CFOs on bank loan contracts should take into account the endogeneity of the choice of female CFOs. To deal with this issue, we first use a Heckman's two-stage self-selection model to control for the self-selection bias induced in firms' choices of female CFOs.

In the first stage, we run a probit regression. The dependent variable is *Female CFOs*. Similar to Huang and Kisgen (2010) and Francis et al. (2010), we include firm size, leverage, profitability, tangibility, market to book ratio in the regression. We also control for industry and year effects. In the second stage, we run OLS regression and

logit regressions as Model 1 of Table 4 and Table 5 but include inverse Mills ratio, which is obtained from the first stage probit regression, to control for the endogeneity of the choice of female CFOs. Table 6 reports the results. We test *Log (spread)*, *Log (maturity)* and *Secured (dummy)* as dependent variables in Columns 1, 2 and 3, respectively. We find that the estimated coefficients of three *Female CFOs* in Column 1, 2 and 3 are -0.1210, 0.089 and -0.4105 and are significant at the 1%, 1% and 5% levels, respectively, suggesting our results hold after considering the endogeneity of the choice of female CFOs.

[Insert Table 6 here]

In our sample, only around 5% firms have female CFOs. In order to fairly compare between two group firms (male and female CFO led firms), we construct a matched male CFO firms by applying a propensity score matching approach. The matching begins with a logistic regression of the female CFO dummy variable on industry, year, firm size and leverage. Then we use the propensity scores obtained from logistic estimation and perform a one to one nearest neighbor match with replacement. This procedure ensures that each female CFO firm is paired with a male CFO firm. Then we obtain a new pooled sample which includes 356 observations with female CFOs and 356 matched observations with male CFOs.

[Insert Table 7 here]

The results are reported in Table 7. Similar to Table 6, we test *Log (spread)*, *Log (maturity)* and *Secured (dummy)* as dependent variables in Columns 1, 2 and 3, respectively. We find that the estimated coefficients of three *Female CFOs* in Column 1, 2 and 3 are -0.117, 0.098 and -0.589 and are significant at different levels. The propensity score matching approach results also confirm our prior findings and further mitigate the sample selection bias concern.

As we use panel data in our studies, unobservable time-variant factors may be correlated with bank loan terms, which would make our results spurious. To remove the effect of contemporaneous changes, we employ a differences-in-differences methodology. Similar to Francis et al. (2010), we first trace firms who change their CFOs from male to female (treated sample) and from male to male (control sample). We require each CFO should be in the offices for at least three consecutive years excluding the transition year. We focus on how male to female CFO changes affect bank loan terms, using male to male CFO change firms as control group. *Post* is a dummy variable which equals one if a year is after CFO transition year and zero if a year is before CFO transition year. The results are in Table 8.

[Insert Table 8 here]

The first column shows the test with *Log (spread)* as the dependent variable. We find that the estimated coefficient of *Post*, which captures the effect of male to male CFO transition on *Log (spread)*, is insignificant, indicating that there is no significant differences of bank loan price between the pre-transition period and the post-transition

period for the control group. The estimated coefficient of the interaction term between *Post* and *Female CFOs*, which captures the incremental effect of male to female CFO transition on *Log (spread)*, is -0.111 and is significant at the 1% level. Hence, compared to male CFOs, female CFOs reduce bank loan spread significantly after CFO transitions. Consistent results are also found in Column 2 and 3 when we use *Log (maturity)* and *Secured (dummy)* as dependent variables. The results of the differences-in-differences approach demonstrates that our findings about the impact of female CFOs on bank loan contracts hold after considering time-variant omitted variable bias. The results also suggest that female CFOs bring about, and not merely reflect, a reduced bank loan price and more favorable non-price loan terms.[13]

[Insert Table 9 here]

In our earlier analysis, the unit of observation is individual loan. However, a borrower can obtain several loans in the same year and those loans may not be independent. Treating these loans independently may overstate statistical significance. To deal with this issue, we use a reduced sample in which we only keep one largest loan for each firm each year. We rerun our main analysis using this firm level sample. The results are reported in Table 9. Although the sample size is reduced from 8986 to 5480, the main results are qualitatively unchanged.

[13] We also consider the self selection issue in the difference-in-difference analysis by control for inverse Mills ratio generated from Heckman's two-stage self-selection model. The results are qualitatively unchanged.

In sum, Table 6, 7, 8 and 9 further confirm our main finding that firms with female CFOs enjoy more favorable price and non-price loan terms, and the robust checks mitigate the potential endogeneity concern in the study.

4.4 The impact of female CFOs on major firm characteristics

In this paper, we establish our hypotheses based on recent studies which show that female CFOs make more conservative corporate decisions, and consequently lead to more favorable bank loan contracts. In Table 3 univariate test, we find that firms with female CFOs are more profitable, have higher market to book ratio and lower leverage level than firms without female CFOs. However, we could not make the conclusion from Table 3 that female CFOs affect those firm characteristics, and subsequently affect bank loan contract terms, as we do not show a causal link between female CFOs and those firm factors.[14]

Although to examine the impact of gender of CFOs on various corporate decision-making is not the focus of this paper, in this sub section, we try to provide some evidence to mitigate this causality concern. Similar to the robustness check in Table 8, we trace firms who change their CFOs from male to female and from male to male. Then we plot the main firm characteristics from three years before CFO transitions till three years after CFO transitions. In this way, we could gain a visual sense of how firm characteristics are affected by CFO gender change. For comparison, we also plot the changes of the same variables for the male to male CFO transition sample.

[14] We thank the referee for pointing this out to us.

[Insert Figure 1 here]

Figure 1-1 shows *leverage* level three years before and three years after the CFO transition. We see male to female CFO transition-firms have higher *leverage* level than male to male CFO transition-firms in general. However, for male to female transition firms, we see a significant and continuous drop of *leverage* after female CFOs are hired. For male to male transition firms, *leverage* remains relatively stable after new male CFOs are hired. The finding shows that female CFOs tend to reduce firm leverage level after they are hired, and it is consistent with the finding by Huang and Kisgen (2010). Prior studies show that leverage is an important indicator of firm risk, and firms with higher leverage level pay more when they borrow (e.g., Strahan (1999) and Graham et al. (2008)). Here we provide a possible channel through which female CFOs affect bank loan contracting.

Figure 1-2 plots how market to book ratio change following CFOs transitions. The trends of market to book ratio for the firms belonging to the two different samples are opposite. For male to female transition-firms, it keeps increasing following the transition from male to female CFOs, while for male to male CFO transition-firms there is a slight decline. The impact of female CFOs on market to book ratio also has implications for bank loan contracting. From accounting perspective, market to book ratio is a proxy for conservatism, with higher market to book ratio indicating more conservative accounting. Prior studies find that firms with more conservative accounting enjoy more favorable bank loan terms (Sunder et al. (2009)). [15]

[15] From finance perspective, market to book ratio could implies either growth opportunity or opaqueness of the firm, and their implications for bank loans are opposite.

Figure 1-3 shows the change of profitability following CFO transitions. Consistent with the finding in Table 3, we find that in general male to female transition firms have higher profitability than male to male transition firms. However, the trends of profitability for two samples are very similar. For both male to male firms and male to female firms, profitability keeps decreasing before CFO transitions. After CFO changes, profitability increases slowly but not significantly. From this figure, we do not find obvious differences between male and female CFOs about their impact on profitability. However, we should notice that we could not make the conclusion that female CFOs do not affect firm performance, as we do not provide a strong statistical analysis here.

In Figure 1-4, we plot how tangibility changes following CFO transitions. We find that before CFO transitions, male to male firms seem to have higher level of tangibility than male to female firms. However, after new CFOs are hired, female CFOs increase the tangibility level continuously, while male CFOs tend to reduce tangibility level gradually. This figure indicates that female CFOs are more likely to invest in tangible assets than male CFOs. Tangibility also has a very important implication for bank loan contracting, as tangible assets are critical for lenders to recover when borrowers default. Prior studies find a strong negative relation between tangibility and cost of bank loans (e.g., Strahan (1999), Bharath et al. (2008) and Graham et al. (2008)). Here we provide another possible channel through which female CFOs affect bank loan contracting.

In general, Figure 1 shows that firms under the control of female CFOs are more likely to invest in tangible assets, decrease leverage level and increase market to book

ratio. These finding could somehow help explain through which channels that female CFOs affect bank loan contracting.

5. Conclusion

In this paper, we examine whether the gender of CFOs affects bank loan contracting. Based on recent empirical work which shows that female CFOs report more conservative and high-quality accounting numbers and are more likely to reduce risk level of the firms, we hypothesize that as inside lenders, banks should recognize the benefits of female CFOs in reducing information risk ex ante and default risk ex post, and reward borrowers with female CFOs with more favorable loan contract terms.

Our empirical results support our hypotheses. We find that, in our sample, firms with female CFOs, on average, enjoy about 14 basis points lower bank loan price than firms with male CFOs. In addition, loans given to female CFO led companies have 3.8 months longer maturities and are 8% less likely to be required to provide collateral than loans given to male CFO led companies. In addition, we do not find that the presence of female CEOs and other female executives affect bank loan contract terms, suggesting that banks view CFOs, but not CEOs or other executives, as the primary executives who determine the quality of accounting information, and in turns, affect their lending decisions.

We further comprehensively examine the potential endogeneity concern in our study. We perform a firm and year fixed effect model, a Heckman two-stage self selection model, a propensity score match method, a differences-in-differences approach and a firm level analysis to test potential issues such as unobservable time variant and

invariant omitted variable bias, self-section bias, causality problem and interdependence among individual loans. Our results hold to all these robustness checks.

To the best of our knowledge, this paper is the first one that links gender of CFOs and other top executives with banks' lending decision-making. The results further our understanding on the determinants of the cost of capital in general, and the cost of bank loan in particular. In addition, our paper tests the gender effect from the informed and sophisticated private lenders perspective, and provides some evidence on the debate as to the systematic differences between men and women with regard to their risk attitudes.

However, we acknowledge that the results of our paper should be considered in the context of its inherent limitations. First, although we find supportive evidence for our "risk-averse" hypothesis, we still cannot rule out the "discrimination" hypothesis in the literature. Due to the data limitations, our study only focuses on large loans (at least one million dollars) granted to public companies. Discrimination effect may be less prominent in such kind of lending decisions. Therefore, it is hard to generalize our findings to small business loans and personal loans. Furthermore, to examine gender discrimination in the credit market, it is very important to focus not only on the interest rates and other loan terms, but also on the availability of private debt financing, such as the denial rates of bank loans, as denial rates are the first-stage evidence to test whether women are discriminated in the credit market. This may be another drawback in our study due to the data limitations.

Second, in our studies, as we do not have the detailed information about individual lenders who are in charge of the lending decision-making, we only consider the gender effect of the borrowers, but not the gender effect of the lenders. If the "risk

averse" does exist between men and women, it is highly possible that male and female lending officers have different judgments on their lending decision-making. Therefore, a more accurate research design should simultaneously take into consideration of the gender of both borrowers and lenders.

Third, based on prior studies, we propose two possible explanations on why banks may care about the gender of CFOs in our paper. One is the accounting information risk explanation and another is the default risk explanation. However, we do not know exactly which factor drives the observed gender effect. In addition, as the research in the gender of top executives is still in its early stage, there may be some other alternative explanations for the observed effect of CFO gender that we do not consider in our paper but are considered by lenders when making their decisions. For example, the gender of CFOs may not only affect discount rate, but also impact firms' performance, which is also a primary factor that determines the cost of capital. Further research could examine the relation between female CFOs and firm performance and whether the public market recognizes the gender differences between male and female CFOs as well as other top executives with regard to their risk attitudes.

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Table 1 Summary statistics

This table presents descriptive statistics for the sample. *Female CFO* is a dummy variable which equals one if a CFO is female and zero otherwise. *Female CEO* is a dummy variable which equals one if a CEO is female and zero otherwise. *Other female executives* is a dummy variable which equals one if at least one member of top management team (excluding CEO and CFO) is female and zero otherwise. *Spread* is the all-in spread drawn which is defined as the amount the borrower pays in basis points over LIBOR or LIBOR equivalent for each dollar drawn down. *Facility* is the total amount of loan facility. *Maturity* is the loan maturity time. *Secured* is a dummy variable which equals one if a loan is secured by collateral, and zero otherwise. *Debt rating* is defined as rating score from 1 to 7 with one indicating an Aaa rating, two indicating an Aa rating, three indicating an A rating, four indicating a Bbb rating, five indicating a Bb rating, six indicating a B or worse rating, and seven indicating no rating. *Prior relations* is the total number of previous loans initiated by the same firms and the same lead lenders in Dealscan. *Assets* is the total assets of the firm. *Leverage* is defined as total debt (long term debt plus debt in current liabilities) divided by total market assets (total debt plus total market value of equity). *Tangibility* is defined as the net property, plant and equipment divided by total assets *Profitability* is defined as the EBITDA divided by total assets. *M/B* is defined as the market value of equity plus book value of debt divided by total assets. *Z-score* is modified Altman's (1968) Z-score which equals (1.2Working capital+1.4Retained earnings + 3.3EBIT + 0.999Sales) /Total assets. Number of observations (Obs.), mean, standard deviation (Std. Dev.), minimum (Min.) and maximum (Max.) are reported in the table.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Female CFO (dummy)	9680	0.049	0.212	0	1
Female CEO (dummy)	9680	0.022	0.146	0	1
Other female executives	9680	0.223	0.416	0	1
Spread	9680	128	116	8	1180
Facility (million)	9680	774	143	1	25000
Maturity	9289	42	25	1	480
Secured (dummy)	5471	0.704	0.456	0	1
Debt rating	9680	5.257	1.611	1	7
Prior relations	9680	2.952	3.485	0	43
Assets (million)	9648	9955	34852	14	750507
Leverage	9565	0.289	0.210	0	0.986
Tangibility	9518	0.342	0.227	0.003	0.970
Profitability	9613	0.139	0.087	-0.784	0.965
M/B	9552	1.5075	1.591	0.031	46.628
Z-score	9100	1.787	1.188	-21.750	9.430

Table 2 Correlation table

This table provides spearman correlations of main variables employed in our analysis. *Female CFO* is a dummy variable which equals one if a CFO is female and zero otherwise. *Female CEO* is a dummy variable which equals one if a CEO is female and zero otherwise. *Other female executives* is a dummy variable which equals one if at least one member of top management team (excluding CEO and CFO) is female and zero otherwise. *Spread* is the all-in spread drawn which is defined as the amount the borrower pays in basis points over LIBOR or LIBOR equivalent for each dollar drawn down. *Facility* is the total amount of loan facility. *Maturity* is the loan maturity time. *Secured* is a dummy variable which equals one if a loan is secured by collateral, and zero otherwise. *Debt rating* is defined as rating score from 1 to 7 with one indicating an Aaa rating, two indicating an Aa rating, three indicating an A rating, four indicating a Bbb rating, five indicating a Bb rating, six indicating a B or worse rating, and seven indicating no rating. *Prior relations* is the total number of previous loans initiated by the same firms and the same lead lenders in Dealscan. *Assets* is the total assets of the firm. *Leverage* is defined as total debt (long term debt plus debt in current liabilities) divided by total market assets (total debt plus total market value of equity). *Tangibility* is defined as the net property, plant and equipment divided by total assets *Profitability* is defined as the EBITDA divided by total assets. *M/B* is defined as the market value of equity plus book value of debt divided by total assets. *Z-score* is modified Altman's (1968) Z-score which equals (1.2Working capital+1.4Retained earnings + 3.3EBIT + 0.999Sales) /Total assets. P values are also reported in the table.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Female CFO (dummy)	1.000														
2 Female CEO (dummy)	0.051	1.000													
	0.000														
3 Other female executives	0.037	0.062	1.000												
	0.000	0.000													
4 Spread	-0.041	0.024	-0.020	1.000											
	0.000	0.021	0.053												
5 Facility	-0.013	0.009	-0.015	-0.126	1.000										
	0.191	0.405	0.132	0.000											
6 Maturity	0.019	0.018	-0.058	0.165	0.015	1.000									
	0.061	0.077	0.000	0.000	0.161										
7 Secured (dummy)	-0.032	-0.001	-0.036	0.025	-0.105	0.000	1.000								
	0.019	0.931	0.008	0.067	0.000	0.985									
8 Debt rating	-0.001	-0.008	-0.028	0.219	-0.260	0.084	0.481	1.000							
	0.934	0.431	0.005	0.000	0.000	0.000	0.000								
9 Prior relations	-0.046	-0.015	-0.049	0.009	0.025	0.011	-0.015	-0.037	1.000						
	0.000	0.130	0.000	0.384	0.016	0.293	0.277	0.000							
10 Assets	0.008	0.007	-0.032	-0.088	0.476	-0.045	-0.074	-0.155	-0.007	1.000					

	0.444	0.500	0.002	0.000	0.000	0.000	0.000	0.000	0.471						
11 Leverage	-0.032	0.009	0.001	0.309	0.086	0.008	-0.036	-0.104	0.067	0.131	1.000				
	0.002	0.358	0.921	0.000	0.000	0.461	0.009	0.000	0.000	0.000					
12 Tangibility	-0.007	-0.050	0.007	-0.063	-0.009	-0.028	-0.017	-0.085	0.015	-0.006	0.255	1.000			
	0.490	0.000	0.496	0.000	0.385	0.007	0.202	0.000	0.132	0.546	0.000				
13 Profitability	0.040	0.001	0.037	-0.218	-0.032	0.034	0.015	-0.010	0.005	-0.078	-0.416	0.032	1.000		
	0.000	0.888	0.000	0.000	0.002	0.001	0.271	0.344	0.598	0.000	0.000	0.002			
14 M/B	0.020	0.015	0.026	-0.055	-0.052	-0.004	0.025	0.062	-0.006	-0.055	-0.422	-0.163	0.376	1.000	
	0.048	0.133	0.010	0.000	0.000	0.692	0.064	0.000	0.587	0.000	0.000	0.000	0.000		
15 Z-score	0.000	-0.001	0.013	-0.221	-0.123	0.010	0.027	0.070	0.016	-0.174	-0.443	-0.257	0.515	0.186	1.000
	0.984	0.955	0.222	0.000	0.000	0.342	0.054	0.000	0.139	0.000	0.000	0.000	0.000	0.000	

Table 3 Univariate comparison

This table presents univariate tests on the differences between firms with female CFOs and firms without female CFOs. *Assets* are total assets of the firm. *Leverage* is defined as total debt (long term debt plus debt in current liabilities) divided by total market assets (total debt plus total market value of equity). *Tangibility* is defined as the net property, plant and equipment divided by total assets *Profitability* is defined as the EBITDA divided by total assets. *M/B* is defined as the market value of equity plus book value of debt divided by total assets. *Z-score* is modified Altman's (1968) Z-score which equals (1.2Working capital+1.4Retained earnings + 3.3EBIT + 0.999Sales) /Total assets. *Spread* is the all-in spread drawn which is defined as the amount the borrower pays in basis points over LIBOR or LIBOR equivalent for each dollar drawn down. *Facility* is the total amount of loan facility. *Maturity* is the loan maturity time. *Secured* is a dummy variable which equals one if a loan is secured by collateral, and zero otherwise. *Debt rating* is defined as rating score from 1 to 7 with one indicating an Aaa rating, two indicating an Aa rating, three indicating an A rating, four indicating a Bbb rating, five indicating a Bb rating, six indicating a B or worse rating, and seven indicating no rating. *Prior relations* is the total number of previous loans initiated by the same firms and the same lead lenders in Dealscan. The means of the differences between the variables for two subsamples and t-statistics are also reported. Significance at the 10%, 5%, and 1% levels are indicated by *, **, and ***, respectively.

	Firms without female CFOs			Firms with female CFOs				
	Obs.	Mean	Std.	Obs.	Mean	Std.	differences	T value
Firm characteristics								
Assets (million)	9179	9894	35316	469	11157	24030	-1263	-0.76
Leverage	9097	0.291	0.211	468	0.26	0.193	0.031***	3.11
Tangibility	9051	0.343	0.227	467	0.336	0.234	0.007	0.69
Profitability	9145	0.138	0.086	468	0.155	0.104	-0.016***	-3.95
M/B	9084	1.501	1.596	468	1.649	1.468	-0.149**	-1.98
Z-score	8644	1.787	1.185	456	1.788	1.248	-0.001	-0.02
Loan characteristics								
Spread	9206	129	117	474	107	91	22***	4.01
Facility (million)	9206	778	1450	474	690	939	88	1.31
Maturity	8815	42	25	474	44	25	-2*	1.87
Secured (dummy)	5201	0.708	0.455	270	0.641	0.481	0.067**	2.34
Debt rating	9206	5.257	1.625	474	5.251	1.523	0.006	0.08
Prior relations	9206	2.988	3.524	474	2.251	2.494	0.737***	4.49
Loan type								
loan type1: 364-day facility	9206	0.217	0.412	474	0.219	0.414	-0.002	-0.13
loan type2: Revolver < 1 year	9206	0.036	0.187	474	0.042	0.201	-0.006	-0.65

loan type3: Revolver >=1 year	9206	0.519	0.499	474	0.527	0.499	-0.008	-0.35
loan type4: Revolver/Term loan	9206	0.011	0.105	474	0.004	0.064	0.007	1.42
loan type5: Term loan	9206	0.172	0.377	474	0.143	0.351	0.028	1.58
loan type6: Others	9206	0.045	0.206	474	0.063	0.243	-0.018*	1.89
Loan purpose								
loan purpose1: Acquisition lines	9206	0.039	0.194	474	0.046	0.201	-0.007	-0.75
loan purpose2: CP backup	9206	0.159	0.365	474	0.186	0.389	-0.027	-1.56
loan purpose3: Corporate purpose	9206	0.322	0.467	474	0.361	0.481	-0.039*	-1.78
loan purpose4: Debt repay	9206	0.157	0.363	474	0.105	0.307	0.051***	3.02
loan purpose5: LBO/MBO	9206	0.012	0.111	474	0.012	0.111	0	0.01
loan purpose6: Recapitalization	9206	0.006	0.078	474	0	0	0.006*	1.72
loan purpose7: Spinoff	9206	0.011	0.107	474	0.006	0.079	0.005	1.07
loan purpose8: Stock buyback	9206	0.009	0.098	474	0.008	0.092	0.001	0.33
loan purpose9: Takeover	9206	0.105	0.307	474	0.074	0.262	0.032**	2.19
loan purpose10: Working capital	9206	0.152	0.358	474	0.167	0.373	-0.015	-0.87
loan purpose11: Others	9206	0.026	0.158	474	0.034	0.181	-0.008	-1.08

Table 4 Female CFOs and bank loan price

This table presents OLS and firm and year fixed effect regression results on the effect of female CFOs on the price of bank loans. The dependent variable is natural log of *spread*, which is the all-in spread drawn defined as the amount the borrower pays in basis points over LIBOR or LIBOR equivalent for each dollar drawn down. *Female CFO* is a dummy variable which equals one if a CFO is female and zero otherwise. *Female CEO* is a dummy variable which equals one if a CEO is female and zero otherwise. *Other female executives* is a dummy variable which equals one if at least one member of top management team (excluding CEO and CFO) is female and zero otherwise. *Log* (*assets)* is natural log of the total assets of the firm. *Leverage* is defined as total debt (long term debt plus debt in current liabilities) divided by total market assets (total debt plus total market value of equity). *Tangibility* is defined as the net property, plant and equipment divided by total assets *Profitability* is defined as the EBITDA divided by total assets. *M/B* is defined as the market value of equity plus book value of debt divided by total assets. *Z-score* is modified Altman's (1968) Z-score which equals (1.2Working capital+1.4Retained earnings + 3.3EBIT + 0.999Sales) /Total assets. *Log (facility)* is natural log of the total amount of loan facility. *Prior relations* is the total number of previous loans initiated by the same firms and the same lead lenders in Dealscan. *Debt rating* is defined as rating score from 1 to 7 with one indicating an Aaa rating, two indicating an Aa rating, three indicating an A rating, four indicating a Bbb rating, five indicating a Bb rating, six indicating a B or worse rating, and seven indicating no rating. *High treasury rate (dummy)* is a dummy variable which equals one if a loan is created on a day where the one year treasury rate is above the median rate for the entire sample period, and zero otherwise. *Year 2002-2006 (dummy*) is dummy variable which equals one if a loan is created after 2001, and zero otherwise. Standard errors are adjusted for within-firm clustering. Absolute values of the heteroskedasticity robust t-statistics are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	Fixed effect	Fixed effect	Fixed effect	Fixed effect	Fixed effect	Fixed effect
	Full sample	Full sample	Full sample	Full sample	Full sample	Sub-sample (1994-2001)	Sub-sample (2002-2006)
Female executives							
Female CFO (dummy)	-0.108***	-0.156***			-0.163***	-0.111*	-0.206***
	[3.99]	[4.67]			[4.84]	[1.74]	[4.13]
Female CEO (dummy)			0.011		-0.007		
			[0.23]		[0.15]		
Other female executive (dummy)				-0.024	-0.028		
				[1.30]	[1.52]		
Firm characteristics							
Log (assets)	-0.161***	-0.229***	-0.228***	-0.228***	-0.229***	-0.179***	-0.134***
	[19.40]	[14.85]	[14.76]	[14.79]	[14.89]	[7.36]	[3.35]
Leverage	1.394***	0.968***	0.972***	0.975***	0.971***	0.846***	0.933***
	[34.01]	[17.08]	[17.12]	[17.17]	[17.12]	[9.56]	[8.61]
Tangibility	-0.247***	-0.276***	-0.269***	-0.263***	-0.268***	-0.362***	-0.106
	[7.12]	[2.95]	[2.87]	[2.80]	[2.86]	[2.60]	[0.53]
Profitability	-0.610***	-0.413***	-0.425***	-0.431***	-0.421***	-0.645***	0.444

	[5.81]	[3.13]	[3.21]	[3.26]	[3.18]	[2.89]	[1.29]
M/B	0.017***	0.003	0.003	0.003	0.003	-0.003	-0.007
	[4.95]	[0.44]	[0.44]	[0.47]	[0.49]	[0.31]	[0.28]
Z-score	-0.070***	-0.02	-0.019	-0.019	-0.02	0.006	-0.125***
	[8.14]	[1.51]	[1.40]	[1.39]	[1.50]	[0.20]	[3.06]
Loan characteristics							
Log (facility)	-0.064***	-0.077***	-0.077***	-0.076***	-0.076***	-0.071***	-0.073***
	[7.35]	[10.71]	[10.64]	[10.58]	[10.63]	[6.91]	[7.15]
Prior relations	0.014***	0.006***	0.006***	0.006***	0.006***	0.003	0.018***
	[6.60]	[3.33]	[3.25]	[3.26]	[3.34]	[1.32]	[4.86]
Debt rating	0.080***	0.044***	0.044***	0.044***	0.044***	0.031***	0.050***
	[17.02]	[8.89]	[8.83]	[8.82]	[8.86]	[4.28]	[6.29]
Other controls							
High treasury rate (dummy)	-0.047***	-0.051***	-0.050***	-0.050***	-0.051***	-0.035	-0.028*
	[2.78]	[3.28]	[3.22]	[3.20]	[3.25]	[0.80]	[1.86]
Year 2002-2006 (dummy)	0.330***	0.431***	0.414***	0.417***	0.435***		
	[8.43]	[10.94]	[10.49]	[10.59]	[10.99]		
Control for							
Industry effect	Y	N	N	N	N	N	N
Year effect	Y	Y	Y	Y	Y	Y	Y
Loan type	Y	Y	Y	Y	Y	Y	Y
Loan purpose	Y	Y	Y	Y	Y	Y	Y
Observations	8986	8986	8986	8986	8986	4684	4302
Adjusted R-squared	0.60	0.26	0.25	0.25	0.26	0.11	0.13

Table 5 Female CFOs, loan maturity and loan collateral

This table presents OLS, firm and year fixed effect and Logit regressions results on the effect of female CFOs on the maturity and collateral of bank loans. The dependent variables are natural log of *maturity*, which is the maturity time (in month) of a loan, and *Secured*, which is a dummy variable which equals one if a loan is secured by collateral and zero otherwise. *Female CFO* is a dummy variable which equals one if a CFO is female and zero otherwise. *Female CEO* is a dummy variable which equals one if a CEO is female and zero otherwise. *Other female executives* is a dummy variable which equals one if at least one member of top management team (excluding CEO and CFO) is female and zero otherwise. *Log* (*assets)* is natural log of the total assets of the firm. *Leverage* is defined as total debt (long term debt plus debt in current liabilities) divided by total market assets (total debt plus total market value of equity). *Tangibility* is defined as the net property, plant and equipment divided by total assets *Profitability* is defined as the EBITDA divided by total assets. *M/B* is defined as the market value of equity plus book value of debt divided by total assets. *Z-score* is modified Altman's (1968) Z-score which equals (1.2Working capital+1.4Retained earnings + 3.3EBIT + 0.999Sales) /Total assets. *Log (facility)* is natural log of the total amount of loan facility. *Prior relations* is the total number of previous loans initiated by the same firms and the same lead lenders in Dealscan. *Debt rating* is defined as rating score from 1 to 7 with one indicating an Aaa rating, two indicating an Aa rating, three indicating an A rating, four indicating a Bbb rating, five indicating a Bb rating, six indicating a B or worse rating, and seven indicating no rating. *High treasury rate (dummy)* is a dummy variable which equals one if a loan is created on a day where the one year treasury rate is above the median rate for the entire sample period, and zero otherwise. *Year 2002-2006 (dummy*) is dummy variable which equals one if a loan is created after 2001, and zero otherwise. Standard errors are adjusted for within-firm clustering. Absolute values of the heteroskedasticity robust t-statistics and z-statistics are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	(1)	(2)	(2)
	OLS	Firm and year fixed effect	Logit
	Log (maturity)	Log (maturity)	Secured (dummy)
Female executives			
Female CFO (dummy)	0.090***	0.086***	-0.389**
	[3.95]	[2.79]	[2.36]
Female CEO (dummy)	-0.021	0.036	0.020
	[0.70]	[0.79]	[0.09]
Other female executive (dummy)	-0.019	-0.010	-0.128
	[1.60]	[0.58]	[1.34]
Firm characteristics			
Log (assets)	-0.024***	-0.015*	0.179***
	[4.01]	[1.91]	[4.27]
Leverage	-0.019	-0.113**	0.32
	[0.56]	[2.12]	[1.38]
Tangibility	0.054**	0.236***	-0.136
	[2.09]	[2.70]	[0.62]
Profitability	0.285***	0.146	1.075*
	[3.67]	[1.18]	[1.91]
M/B	-0.005	-0.009	0.012
	[0.87]	[1.38]	[0.37]
Z-score	0.012*	0.024*	-0.034
	[1.67]	[1.96]	[0.72]
Loan characteristics			
Log (facility)	0.084***	0.062***	0.078*
	[12.22]	[9.06]	[1.87]
Prior relations	-0.001	-0.001	0.002
	[0.81]	[0.15]	[0.16]
Debt rating	-0.013***	-0.014***	0.954***

	[3.90]	[2.90]	[27.22]
Other controls			
High treasury rate (dummy)	0.018	0.025*	0.206**
	[1.38]	[1.72]	[2.00]
Year 2002-2006 (dummy)	0.103***	0.105***	-0.173
	[3.57]	[3.24]	[0.77]
Control for			
Industry effect	Y	N	Y
Year effect	Y	Y	Y
Loan type	Y	Y	Y
Loan purpose	Y	Y	Y
Observations	8561	8561	5075
Adjusted / Pseudo R-squared	0.69	0.60	0.22

Table 6: Female CFOs and bank loans: Heckman two-stage model results

This table presents Heckman two-stage self selection models results on the effect of female CFOs on the price, maturity and collateral of bank loans. In the first stage, we run a probit regression by regress *Female CFO* on a set of firm characteristics. The table report second stage OLS and Logit regression results including inverse mills ratio. The dependent variables are natural log of *spread*, which is the all-in spread drawn defined as the amount the borrower pays in basis points over LIBOR or LIBOR equivalent for each dollar drawn down, natural log of *maturity*, which is the maturity time (in month) of a loan, and *Secured*, which is a dummy variable which equals one if a loan is secured by collateral and zero otherwise. *Female CFO* is a dummy variable which equals one if a CFO is female and zero otherwise. *Log* (*assets)* is natural log of the total assets of the firm. *Leverage* is defined as total debt (long term debt plus debt in current liabilities) divided by total market assets (total debt plus total market value of equity). *Tangibility* is defined as the net property, plant and equipment divided by total assets *Profitability* is defined as the EBITDA divided by total assets. *M/B* is defined as the market value of equity plus book value of debt divided by total assets. *Z-score* is modified Altman's (1968) Z-score which equals (1.2Working capital+1.4Retained earnings + 3.3EBIT + 0.999Sales) /Total assets. *Log (facility)* is natural log of the total amount of loan facility. *Prior relations* is the total number of previous loans initiated by the same firms and the same lead lenders in Dealscan. *Debt rating* is defined as rating score from 1 to 7 with one indicating an Aaa rating, two indicating an Aa rating, three indicating an A rating, four indicating a Bbb rating, five indicating a Bb rating, six indicating a B or worse rating, and seven indicating no rating. *High treasury rate (dummy)* is a dummy variable which equals one if a loan is created on a day where the one year treasury rate is above the median rate for the entire sample period, and zero otherwise. *Year 2002-2006 (dummy*) is dummy variable which equals one if a loan is created after 2001, and zero otherwise. Standard errors are adjusted for within-firm clustering. Absolute values of the heteroskedasticity robust t-statistics and z-statistics are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	(1)	(2)	(3)
	Log (spread)	Log (maturity)	Secured (dummy)
Female CFO (dummy)	-0.110***	0.089***	-0.405**
	[4.09]	[3.90]	[2.47]
Firm characteristics			
Log (assets)	-0.161***	-0.023***	0.181***
	[19.46]	[3.92]	[4.33]
Leverage	1.527***	-0.044	0.295
	[23.39]	[0.86]	[0.84]
Tangibility	-0.212***	0.050*	-0.136
	[5.70]	[1.77]	[0.59]
Profitability	-1.090***	0.362**	1.122
	[5.23]	[2.29]	[1.01]
M/B	0.019***	-0.005	0.012
	[5.53]	[0.98]	[0.37]
Z-score	-0.050***	0.009	-0.037
	[4.47]	[0.95]	[0.61]
Loan characteristics			
Log (facility)	-0.064***	0.084***	0.078*
	[7.37]	[12.18]	[1.86]
Prior relations	0.014***	-0.001	0.002
	[6.60]	[0.76]	[0.20]
Debt rating	0.080***	-0.013***	0.954***
	[17.05]	[3.87]	[27.26]
Other controls			
High treasury rate (dummy)	-0.047***	0.017	0.203**
	[2.82]	[1.35]	[1.97]
Year 2002-2006 (dummy)	-0.027	0.163	-0.116

	[0.20]	[1.57]	[0.16]
Inverse mills ratio	-0.333***	0.059	0.064
	[2.67]	[0.62]	[0.10]
Control for			
Industry effect	Y	Y	Y
Year effect	Y	Y	Y
Loan type	Y	Y	Y
Loan purpose	Y	Y	Y
Observations	8986	8561	5075
Adjusted R-squared	0.61	0.69	0.22

Table 7: Female CFOs and bank loans: Propensity score match results

This table presents OLS and Logit regressions results on the effect of female CFOs on the price, maturity and collateral of bank loans by applying a propensity score matching approach. The matching begins with a logistic regression of the *Female CFO* on year industry, firm size and leverage. Then we use the propensity scores obtained from logistic estimation and perform a one to one nearest neighbor match with replacement. The dependent variables are natural log of *spread*, which is the all-in spread drawn defined as the amount the borrower pays in basis points over LIBOR or LIBOR equivalent for each dollar drawn down, natural log of *maturity*, which is the maturity time (in month) of a loan, and *Secured*, which is a dummy variable which equals one if a loan is secured by collateral and zero otherwise. *Female CFO* is a dummy variable which equals one if a CFO is female and zero otherwise. *Log (assets)* is natural log of the total assets of the firm. *Leverage* is defined as total debt (long term debt plus debt in current liabilities) divided by total market assets (total debt plus total market value of equity). *Tangibility* is defined as the net property, plant and equipment divided by total assets *Profitability* is defined as the EBITDA divided by total assets. *M/B* is defined as the market value of equity plus book value of debt divided by total assets. *Z-score* is modified Altman's (1968) Z-score which equals (1.2Working capital+1.4Retained earnings + 3.3EBIT + 0.999Sales) /Total assets. *Log (facility)* is natural log of the total amount of loan facility. *Prior relations* is the total number of previous loans initiated by the same firms and the same lead lenders in Dealscan. *Debt rating* is defined as rating score from 1 to 7 with one indicating an Aaa rating, two indicating an Aa rating, three indicating an A rating, four indicating a Bbb rating, five indicating a Bb rating, six indicating a B or worse rating, and seven indicating no rating. *High treasury rate (dummy)* is a dummy variable which equals one if a loan is created on a day where the one year treasury rate is above the median rate for the entire sample period, and zero otherwise. *Year 2002-2006 (dummy*) is dummy variable which equals one if a loan is created after 2001, and zero otherwise. Standard errors are adjusted for within-firm clustering. Absolute values of the heteroskedasticity robust t-statistics and z-statistics are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	(1)	(2)	(3)
	Log (spread)	Log (maturity)	Secured (dummy)
Female CFO (dummy)	-0.117**	0.098***	-0.589*
	[2.41]	[2.60]	[1.90]
Firm characteristics			
Log (assets)	-0.172***	-0.018	-0.037
	[7.38]	[0.91]	[0.27]
Leverage	1.617***	-0.243**	1.928*
	[10.13]	[2.22]	[1.77]
Tangibility	-0.420***	0.174	-0.683
	[3.11]	[1.56]	[0.94]
Profitability	-0.847**	0.109	-0.169
	[2.41]	[0.37]	[0.07]
M/B	0.036*	-0.007	0.172
	[1.66]	[0.38]	[0.85]
Z-score	-0.083***	0.035	0.214
	[2.98]	[1.50]	[1.37]
Loan characteristics			
Log (facility)	-0.094***	0.071***	0.162
	[3.75]	[3.35]	[1.08]
Prior relations	0.007	-0.005	-0.01
	[0.95]	[0.72]	[0.23]
Debt rating	0.061***	-0.013*	0.593***
	[3.70]	[1.87]	[5.24]
Other controls			
High treasury rate (dummy)	0.024	-0.02	0.362
	[0.40]	[0.40]	[0.91]
Year 2002-2006 (dummy)	0.071	0.229	0.785

	[0.37]	[1.47]	[0.82]
Control for			
Industry effect	Y	Y	Y
Year effect	Y	Y	Y
Loan type	Y	Y	Y
Loan purpose	Y	Y	Y
Observations	712	703	389
Adjusted/ Pseudo R-squared	0.61	0.66	0.18

Table 8: Female CFOs and bank loans: Differences-in-differences regression results

This table presents OLS and Logit regressions results on the effect of female CFOs on the price, maturity and collateral of bank loans by applying a differences-in-differences approach. We trace firms who change their CFOs from male to female (treated sample) and male to male (control group). We require each CFO has to be in office consecutively for at least 3 years excluding the transition year. The dependent variables are natural log of *spread*, which is the all-in spread drawn defined as the amount the borrower pays in basis points over LIBOR or LIBOR equivalent for each dollar drawn down, natural log of *maturity*, which is the maturity time (in month) of a loan, and *Secured*, which is a dummy variable which equals one if a loan is secured by collateral and zero otherwise. *Post* is a dummy variable which equals one if a year is after CFO transition year and zero if a year is before CFO transition year. *Female CFO* is a dummy variable which equals one if a CFO is female and zero otherwise. *Log* (*assets)* is natural log of the total assets of the firm. *Leverage* is defined as total debt (long term debt plus debt in current liabilities) divided by total market assets (total debt plus total market value of equity). *Tangibility* is defined as the net property, plant and equipment divided by total assets *Profitability* is defined as the EBITDA divided by total assets. *M/B* is defined as the market value of equity plus book value of debt divided by total assets. *Z-score* is modified Altman's (1968) Z-score which equals (1.2Working capital+1.4Retained earnings + 3.3EBIT + 0.999Sales) /Total assets. *Log (facility)* is natural log of the total amount of loan facility. *Prior relations* is the total number of previous loans initiated by the same firms and the same lead lenders in Dealscan. *Debt rating* is defined as rating score from 1 to 7 with one indicating an Aaa rating, two indicating an Aa rating, three indicating an A rating, four indicating a Bbb rating, five indicating a Bb rating, six indicating a B or worse rating, and seven indicating no rating. *High treasury rate (dummy)* is a dummy variable which equals one if a loan is created on a day where the one year treasury rate is above the median rate for the entire sample period, and zero otherwise. *Year 2002-2006 (dummy*) is dummy variable which equals one if a loan is created after 2001, and zero otherwise. Standard errors are adjusted for within-firm clustering. Absolute values of the heteroskedasticity robust t-statistics and z-statistics are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	(1)	(2)	(3)
	Log (spread)	Log (maturity)	Secured (dummy)
Post (dummy)	0.010	0.010	0.035
	[0.27]	[0.40]	[0.17]
Post*Female CFO	-0.111***	0.077***	-0.521**
	[2.64]	[2.85]	[2.26]
Firm characteristics			
Log (assets)	-0.157***	-0.010	0.230**
	[9.70]	[0.87]	[2.54]
Leverage	0.071**	0.005	0.297
	[2.08]	[0.15]	[1.50]
Tangibility	-0.159	0.053	-1.008
	[0.62]	[0.34]	[0.78]
Profitability	0.138*	0.064	0.711
	[1.82]	[1.23]	[1.58]
M/B	-0.139***	-0.025	-0.286
	[3.84]	[0.79]	[1.33]
Z-score	-0.187***	0.068***	0.001
	[8.00]	[4.63]	[0.01]
Loan characteristics			
Log (facility)	-0.067***	0.063***	0.096
	[3.82]	[4.93]	[1.08]
Prior relations	0.096***	0.004	1.065***
	[10.41]	[1.15]	[15.67]
Debt rating	0.033***	-0.014**	0.005
	[7.89]	[2.33]	[0.21]
Other controls			
High treasury rate (dummy)	0.023	0.005	-0.226

	[0.66]	[0.20]	[1.15]
Year 2002-2006 (dummy)	0.323***	0.142*	-0.186
	[3.40]	[1.82]	[0.41]
Control for			
Industry effect	Y	Y	Y
Year effect	Y	Y	Y
Loan type	Y	Y	Y
Loan purpose	Y	Y	Y
Observations	2502	2405	1427
Adjusted/ Pseudo R-squared	0.57	0.73	0.28

Table 9: Female CFOs and bank loans: Firm level regression results

This table presents OLS and Logit regressions results on the effect of female CFOs on the price, maturity and collateral of bank loans using a reduced sample in which we only keep one largest loan for each firm each year. The dependent variables are natural log of *spread*, which is the all-in spread drawn defined as the amount the borrower pays in basis points over LIBOR or LIBOR equivalent for each dollar drawn down, natural log of *maturity*, which is the maturity time (in month) of a loan, and *Secured*, which is a dummy variable which equals one if a loan is secured by collateral and zero otherwise. *Female CFO* is a dummy variable which equals one if a CFO is female and zero otherwise. *Log* (*assets)* is natural log of the total assets of the firm. *Leverage* is defined as total debt (long term debt plus debt in current liabilities) divided by total market assets (total debt plus total market value of equity). *Tangibility* is defined as the net property, plant and equipment divided by total assets *Profitability* is defined as the EBITDA divided by total assets. *M/B* is defined as the market value of equity plus book value of debt divided by total assets. *Z-score* is modified Altman's (1968) Z-score which equals (1.2Working capital+1.4Retained earnings + 3.3EBIT + 0.999Sales) /Total assets. *Log (facility)* is natural log of the total amount of loan facility. *Prior relations* is the total number of previous loans initiated by the same firms and the same lead lenders in Dealscan. *Debt rating* is defined as rating score from 1 to 7 with one indicating an Aaa rating, two indicating an Aa rating, three indicating an A rating, four indicating a Bbb rating, five indicating a Bb rating, six indicating a B or worse rating, and seven indicating no rating. *High treasury rate (dummy)* is a dummy variable which equals one if a loan is created on a day where the one year treasury rate is above the median rate for the entire sample period, and zero otherwise. *Year 2002-2006 (dummy*) is dummy variable which equals one if a loan is created after 2001, and zero otherwise. Standard errors are adjusted for within-firm clustering. Absolute values of the heteroskedasticity robust t-statistics and z-statistics are in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

	(1)	(2)	(3)
	Log (spread)	Log (maturity)	Secured (dummy)
Female CFO (dummy)	-0.095***	0.093***	-0.345*
	[2.75]	[3.49]	[1.74]
Firm characteristics			
Log (assets)	-0.163***	-0.021***	0.179***
	[15.21]	[2.72]	[3.27]
Leverage	1.399***	-0.006	1.245***
	[25.74]	[0.13]	[3.85]
Tangibility	-0.278***	0.058*	-0.186
	[6.24]	[1.75]	[0.67]
Profitability	-0.484***	0.277***	0.994
	[3.65]	[2.86]	[1.33]
M/B	0.016***	-0.009	0.111**
	[3.78]	[1.26]	[2.12]
Z-score	-0.073***	0.019**	-0.016
	[6.02]	[2.27]	[0.28]
Loan characteristics			
Log (facility)	-0.081***	0.095***	0.073
	[7.09]	[10.51]	[1.31]
Prior relations	0.010***	-0.002	-0.016
	[3.48]	[0.76]	[1.10]
Debt rating	0.078***	-0.008**	0.923***
	[13.44]	[1.98]	[21.33]
Other controls			
High treasury rate (dummy)	-0.039*	0.022	0.166
	[1.85]	[1.37]	[1.23]
Year 2002-2006 (dummy)	0.235***	0.130***	0.575**
	[4.86]	[3.80]	[2.08]

Control for			
Industry effect	Y	Y	Y
Year effect	Y	Y	Y
Loan type	Y	Y	Y
Loan purpose	Y	Y	Y
Observations	5480	5212	3117
Adjusted/ Pseudo R-squared	0.60	0.70	0.21

Figure 1: firm characteristics changes following CFO gender change

Figure 1-1

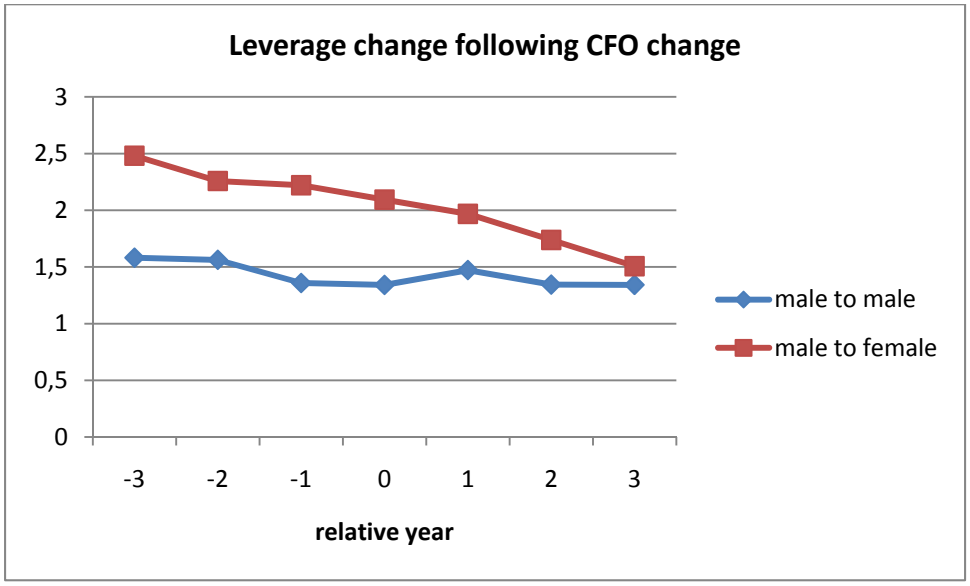


Figure 1-2

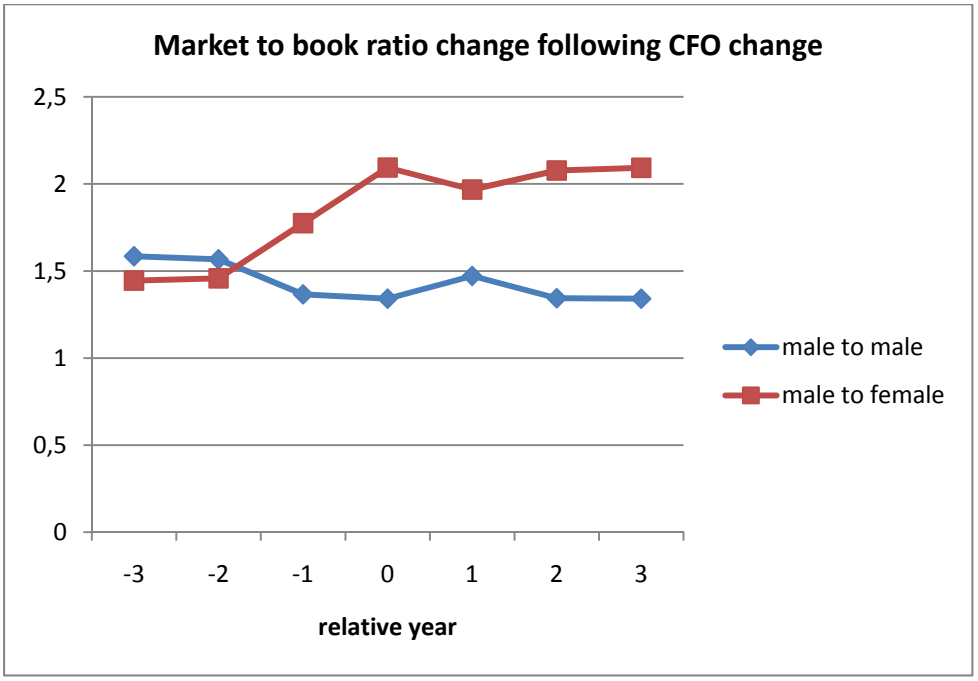


Figure 1-3

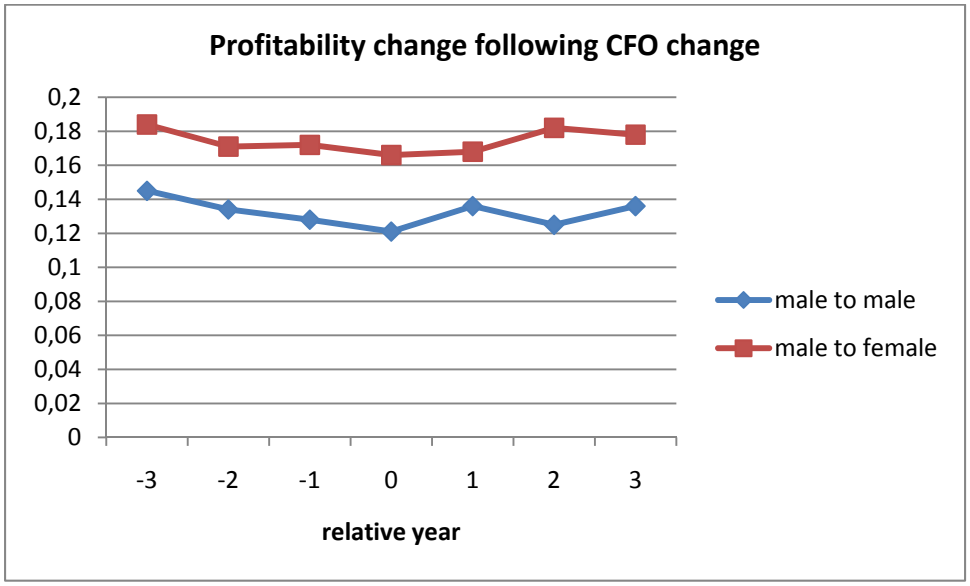
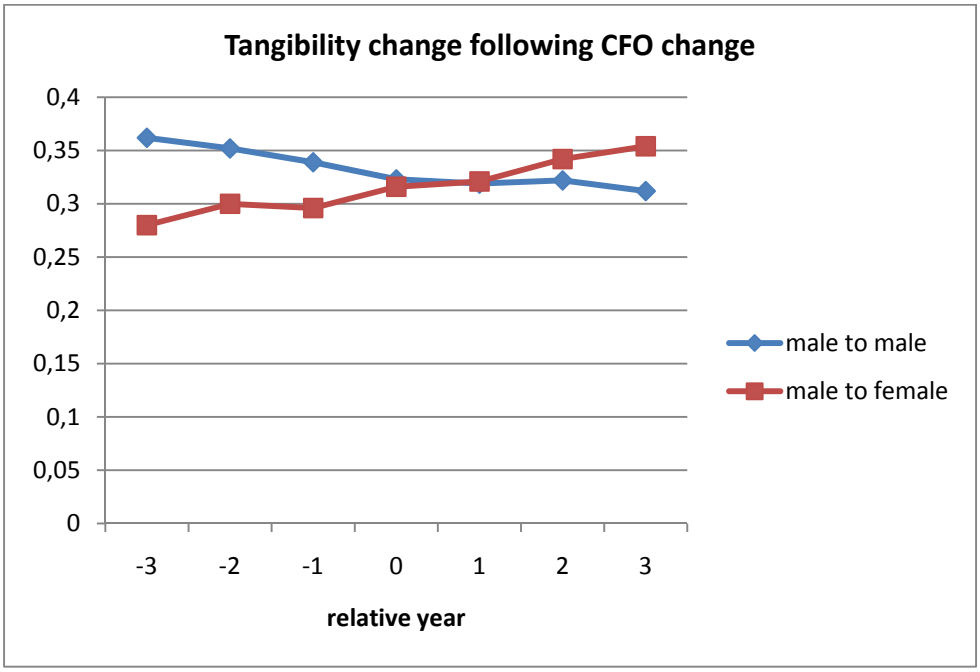


Figure 1-4



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Suomen Pankki
Bank of Finland
P.O.Box 160
FI-00101 HELSINKI
Finland

. 2343