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Preliminary

Abstract

Using loan- and firm-level data from a government financial institution for small and medium enterprises (SMEs) in Japan, this paper examines the relationship between personal guarantee agreements on bank loans by SMEs' managers and their CEO succession. Looking at the period after the introduction of the 2014 Guidelines for Personal Guarantees Provided by Business Owners, which asks banks not to impose personal guarantees on loans to SMEs, we find that receiving loans without personal guarantees increases SMEs' CEO succession. Combined with SMEs' ownership data, we also find that the response is moderated for owner-managed firms. Our results also suggest that the connection between personal guarantees and CEO succession is weaker for firms in industries in which family succession is more common. We conducted a survey and found that the causality between borrowing without personal guarantees and succession runs in both directions. Some firms took out loans without personal guarantees for the purpose of facilitating CEO succession, while others found that their CEO succession was made easier by receiving loans without personal guarantees.

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1. Introduction

Recent studies have confirmed the importance of CEO succession strategy for firm performance (Lee et al. 2003, Pérez-González 2006, Cucculelli and Micucci 2008, Mehrotra et al. 2013). Moreover, CEO succession influences the age of CEOs, which is often identified as an important driver of firm growth (Cannella et al. 2009, Serfling 2014 , Belenzon et al. 2019). Although the literature has shown that several factors can influence CEO succession, such as CEOs' family structure (Bennedsen et al. (2007)), CEO ability (Boeker 1992), and legal protection for stakeholders (La Porta et al., 1999, Claessens et al., 2000), little is known about the relationship between corporate financial contracts and CEO succession.

In parallel, the corporate finance literature has documented that a firm's financial contracting affects various corporate strategies, such as investment decisions (Nini et al. 2009, Nini et al. 2012, Roberts and Sufi 2009), operational flexibility (Benmelech et al. 2020), and innovative activities (Chava et al. 2017, Hochberg et al. 2018, Mann 2018, Ma et al. 2022). This paper bridges the two areas of literature by examining the relationship between a firm's financial contracts and CEO succession.[1] Specifically, we look at a particular property of corporate loan contracts that is prevalent among SMEs in Japan, namely personal guarantees by SME managers, and examine how personal guarantees affect CEO succession likelihood.

We focus on Japan to examine the relationship between personal guarantees and CEO succession for two reasons. First, Japan has been experiencing the fastest population aging among G20 countries (Rouzet et al. 2019), with CEO aging being of growing importance to the economy. The average age of CEOs in Japanese companies increased from 54.0 years in 1990 to 60.1 years

[1]There are only a few papers documenting the relationship between firms' financing strategy and CEO succession. One of these was Wasserman (2003), who found that the need for a new round of financing can be a force behind succession.

in 2020.[2] Given the negative correlation between firm growth and CEO age identified in the literature (e.g., Belenzon et al. 2019), encouraging succession to younger CEOs is among Japan's urgent needs (Japan Industry Review 2017). Second, a Japanese policy reform in 2014, which will be explained in detail later, led to a drastic decrease in the use of personal guarantees by the Japanese banking industry. The policy reform allows us to compare firms that have borrowed with and without personal guarantees and how they differ in their CEO succession likelihood.

A personal guarantee in a loan contract requires an individual to personally repay the loan if the company is unable to do so. A personal guarantee increases the cost of default for the borrower and mitigates moral hazard, as collateral would do. For small and medium enterprises (SMEs) that do not have many physical assets that could serve as collateral, a personal guarantees provide an effective mechanism to limit moral hazard (Thakor and Udell 1991, Bester 1994). In many countries, financial institutions heavily use personal guarantees when lending to SMEs. For example, in 2014, more than 80% of newly issued loans to SMEs by Japanese banks were issued with personal guarantees.[3]

Although a personal guarantee may facilitate lending by mitigating moral hazard, it could also impose a huge burden on CEOs and their families. When a business gets into trouble, a personal guarantee can cause personal tragedy (e.g., forfeiting houses and cars), as the majority of such guarantees exceed the total amount of CEOs' personal assets.[4] Moreover, when the CEO of a company changes, it was customary in Japan for a financial institution to re-

[2]The numbers come from the Teikoku Data Bank. See https://www.tdb.co.jp/report/watching/press/p210202.html for more detail.

[3]See https://www.fsa.go.jp/policy/hoshou_jirei/index.html for the numbers.

[4]According to a survey of SME personal guarantee practices in 2013, more than 68% of personal guarantees exceeded the amount that could be repaid with CEOs' personal assets, including financial assets and real estate. The survey report (in Japanese) is available at https://dl.ndl.go.jp/info:ndljp/pid/11252876.

quire personal guarantees from the new CEO, which may discourage a successor from taking over the business for fear of the downside financial risk.[5]

To address concerns about the dark side of personal guarantees, the Japan Bankers Association and Japan Chamber of Commerce developed the Guidelines for Personal Guarantees Provided by Business Owners in December 2013.[6] The guidelines ask SMEs to properly separate business assets from personal ones and banks not to require personal guarantees from SMEs that follow the guidelines. The guidelines became effective on February 1, 2014.

Since the guidelines were implemented, the reliance on personal guarantees for SME loans has declined. From March 2014 to March 2021, the proportion of newly issued loans that did not require personal guarantees increased from 19% to 45% at government-owned financial institutions and from 12% to 30% at private-sector commercial banks.[7] Using data from the period when the practice of requiring CEOs to provide personal guarantees started to decline, we examine whether firms that took loans without personal guarantees by CEOs have a higher CEO succession rate than those that borrowed with personal guarantees after the implementation of the guidelines.

Our empirical analysis shows that receiving a loan without a personal guarantee is associated with a higher rate of CEO succession. In addition, several factors are found to weaken this relationship. For example, the impact of having loans without personal guarantees is weaker for firms in in-

[5]Many surveys have found the negative impact of personal guarantees on CEO succession in Japan. According to the Survey of SME Support, JAPAN, of the appointed successor CEOs who refused to take over businesses, 59.8% answered that they did so purely because of personal guarantee responsibilities for previously issued loans (https://www.chusho.meti.go.jp/kinyu/hosyoukaijo/2020/200204kaijo02.pdf). Furthermore, the Survey of SME Business Succession in 2009 showed that the personal guarantee requirements for new CEOs were amoung the main obstacles of SME CEO succession. See https://www.jfc.go.jp/n/findings/pdf/sme_findings091216.pdf for more detail on the survey.

[6]The guidelines (only in Japanese) can be accessed from the FSA website (https://www.fsa.go.jp/news/25/ginkou/20131209-1.html).

[7]See https://www.chusho.meti.go.jp/kinyu/keieihosyou/.

dustries in which family succession is more common. We also find that owner-managed firms' succession does not depend as much on whether their loans come with personal guarantees. Succession in owner-managed firms involves more factors than it does in non-owner-managed firms, including inheritance tax and the CEO's emotional attachment to the firm, which may weaken the effect of personal guarantees on succession.

The primary dataset we analyze contains proprietary information from the SME Unit of the Japan Finance Corporation (JFC), a government-owned financial institution specializing in policy-based lending to SMEs. We analyze loan- and firm-level information on SMEs that received new financing from the SME Unit of the JFC between February 2014 and March 2016. Theloan-level data contain information for each loan, including whether they were issued with personal guarantees. The firm-level data include firms' accounting information, industry classification, and managers' attributes, such as their birthdays and shareholdings. Although the data were anonymized, but the loan-level data can be combined with firm-level data by firm IDs unique to each firm. Additionally, we use business succession data for SMEs collected by Tokyo Shoko Research (TSR) to construct the industry-level share of family succession.

An interesting but potentially concerning aspect of our analysis is the extent to which the firms' endogenous selection can explain our result. Firms that want to replace their CEOs may be more likely to take out loans without personal guarantees. To address this point, we took two steps. First, we excluded firms that borrowed specifically for the purpose of their CEO succession from our sample. The JFC offers various loan programs depending on the borrowing purpose, and some of these target SMEs that need financing to execute their CEO succession plan. We removed a part of the selection bias by excluding SMEs that had borrowed from the loan program for the purpose of CEO succession from our sample. However, some selection

bias remains in the estimation if firms that want to replace their CEOs are more likely to borrow without personal guarantees and for non-succession purposes. Therefore, second, we surveyed Japanese SMEs and directly asked whether the selection had taken place. The survey showed that 40% of the surveyed firms that had borrowed without personal guarantees and experienced CEO succession during our sample period chose to do so primarily for succession purposes. The findings indicate that selection exists but is not the only driver of our results.

Our paper makes three main contributions. First, and most importantly, we document that a firm's loan contract specification is related to its succession decision. We find that taking out loans without a personal guarantee increases the probability of CEO succession in the subsequent five years by about 2.9%. Given that the share of firms that experienced CEO succession during our sample period (April 2016 to March 2020) was approximately 13.7%, 2.9% is substantial.

Second, we explore factors that weaken the relationship between personal guarantees and succession. We find that the presence of personal guarantees is a less important determinant of CEO succession for firms in industries in which family succession is more common. We also find that the increase in propensity to have CEO succession after receiving a loan without a personal guarantee is smaller for owner-managed firms. These findings have important implications on corporate strategy because a firm's performance after succession is likely to depend on its ownership structure (Huson et al. 2004, Kato and Long 2006) or whether it has experienced family succession (Pérez-González 2006).

Finally, we deal with firm selection issues by using detailed loan program information and surveying SMEs. Endogenous selection bias is a major issue when identifying causal relationships between financial and corporate strategy (Parsons and Titman 2008) because firms make joint decisions on

their financial structure and corporate strategy. In this paper, we not only isolate firm selection using the detailed loan program information but also quantify the fraction of the results that selection can explain. Quantifying selection is particularly valuable in our context because firm selection would further facilitate CEO succession by benefiting from the removal of personal guarantees.

The remainder of the paper is organized as follows. Section 2 discusses the theoretical background and outlines our empirical hypotheses. Section 3 explains the Japanese policy reform of 2014 that we exploit in our empirical strategy. Section 4 describes our data and discusses our estimation procedures. Section 5 presents our empirical results. Section 6 shows our survey method and results. Section 7 concludes our study.

2. Theoretical Background

CEO changes are critical turning points for companies due to the importance of CEOs in their strategies and, in turn, performance (Adner and Helfat 2003, Hambrick 2007, Hambrick and Mason 1984, Lee et al. 2003, Pérez-González 2006, Cucculelli and Micucci 2008, Mehrotra et al. 2013). Thus, it is crucial to understand what factors affect CEO succession.[8] This section discusses how the personal guarantee agreements in firms' loan contracts may negatively affect their CEO succession likelihood. We also discuss possible factors that may moderate or exacerbate this relationship.

When CEO succession occurs in a Japanese SME, a financial institution often requires the new CEO to provide a personal guarantee for loans taken out by previous CEOs. According to an FSA survey in 2016 of Japanese companies that had recently experienced CEO succession, 46% of the new CEOs

[8]Berns and Klarner (2017) provides extensive surveys of the literature on the potential factors that affect CEO succession

had been asked to provide personal guarantees on previously issued loans, in addition to the guarantees made by the previous CEOs. Another 28% had been asked to inherit and become solely responsible for personal guarantees.[9] In either case, the new CEOs were personally responsible for repaying the loans given to the previous CEOs.

Personal guarantee responsibilities for successor CEOs can discourage CEO succession in several ways. First, personal guarantees can impose significant downside financial risk on new CEOs. Without personal guarantees, even if the CEO owns a substantial portion of the business, the liability is limited to the ownership. Offering personal guarantees, however, can put the new CEO's personal assets at risk in case of loan default. Furthermore, when the guaranteed amount exceeds the CEO's personal assets, the CEO may be forced to file for personal bankruptcy. According to a TSR survey, among the 5552 firms that went bankrupt in Japan in 2020, 3789 CEOs (68.2%) personally went bankrupt due to their personal guarantee responsibilities.[10] The significant downside financial risk may discourage potential successors from taking over businesses when the companies have outstanding loans with personal guarantees.

Second, the downside financial risk of personal guarantees can cause the CEOs' mental health to deteriorate. It is obvious that many CEOs operate under great pressure in their jobs, and, according to a Japanese survey by *INOUZ Times* in 2018, the anticipated stress of being a CEO is identified as one of the major reasons of why people did not want to become CEOs.[11] Personal guarantee responsibilities, due to the significant financial risk, have been associated with mental health issues for responsible CEOs (Kamei et

[9]The numbers are from https://www.sangiin.go.jp/japanese/annai/chousa/keizai_prism/backnumber/r02pdf/202018501.pdf.

[10]See https://www.tsr-net.co.jp/news/analysis/20210816_01.html for more detail.

[11]The survey result is available at: https://inouz.jp/times/question_president/ (only in Japanese).

al. 2011). The anticipated stress from personal guarantees may discourage potential successors from taking over a business. Moreover, since having good mental health is of utmost importance for making good strategic decisions (Hessels et al. 2018, Mannor et al. 2016), the anticipated stress from personal guarantees may discourage not only the successors but also companies from replacing their CEOs.

Finally, the downside financial risk may limit successor CEOs' proactive strategic decisions, decreasing companies' incentive for CEO succession. One of the main benefits of CEO succession in terms of firm performance is that new CEOs bring fresh perspectives to companies (Karaevli and Zajac 2013, Quigley and Hambrick 2012). However, with personal guarantees, successor CEOs may avoid making profitable yet risky strategic choices for fear of business failure and of the personal hardship that would follow.[12] If the company anticipates that the successor CEO will act in an overly risk-averse way due to the existence of personal guarantee responsibilities, it might have less incentive to replace the current CEO.

These considerations can lead to lower CEO succession incentive for the successor CEO and their company when the company has a larger share of outstanding loans issued with personal guarantee agreements before their succession. Given that our primary focus is on the effect of the guidelines that reduce the use of personal guarantees on bank loans, we propose the following hypothesis:

Hypothesis 1 *A larger share of outstanding loans without personal guarantee agreements is associated with a higher likelihood of subsequent CEO succession.*

[12] Extensive research has suggested that CEOs' personal costs under corporate bankruptcy motivate them to hedge against bankruptcy risk at the expense of firm growth and shareholder value (Eckbo et al. 2016, Bates et al. 2009, Strebulaev and Yang 2013, Eckbo and Thorburn 2003, Eisdorfer 2008).

CEO ownership. The ownership structure of firms may affect the strength of the relationship between personal guarantees and CEO succession. Specifically, we focus on CEO ownership. Owner-managed firms, which we define as companies whose CEOs are also their shareholders, are prevalent in Japan. According to a survey by the Small and Medium Enterprise Agency in 2017, CEOs are the largest company shareholders in 72% of SMEs in Japan, of which 30% do not have external shareholders.[13]

We expect owner-managed firms to differ from other firms in several ways. First, owner-CEOs have more control over corporate decisions due to their shareholding (Denis and Denis 1994). Extensive research has documented that owner-managed firms have different corporate strategies and resulting performance compared with non-owner-managed firms (Chaganti and Damanpour 1991, Brush et al. 2000, Werner et al. 2005)). Some studies have suggested that the concentration of power with the owner-manager ends up harming corporate value through the owner-manager's opportunistic strategy decisions (Wasserman 2006, Durand and Vargas 2003, Bena and Xu 2017, Fitza and Tihanyi 2017), including succession decisions (Schulze and Zellweger 2021). If owner-managers engage in opportunistic end-game strategies, they will care less about the potential successor's motivation to take over the businesses, and whether the loans are personally guaranteed or not becomes less relevant to succession decisions.

Second, CEOs in owner-managed companies are often highly attached to their firms. The majority of owner-managers are founder-managers (Denis and Denis 1994, Wasserman 2001), who tend to have more emotional attachment to their firms. They use language that describes the firm as their "fam-

[13] See https://www.chusho.meti.go.jp/pamflet/hakusyo/H30/h30/html/b1_4_2_2.html for the survey (in Japanese).

ily" or "children" (Dobrev and Barnett 2005, Nelson 2003), and their identities are often strongly tied to their firms (Powell and Baker 2014). Their strong attachment to their companies might lead to them having a greater desire to remain in place longer (Fattoum-Guedri et al. 2018, Wasserman 2003). In this case, we expect whether loans are personally guaranteed or not to become a less important determinant of CEO succession.

Finally, CEO succession in an owner-managed firm will involve the transfer or sale of company shares. In such a case, legal considerations regarding ownership transfer, such as inheritance and estate tax payments, become important (Bennedsen et al. 2015, Tsoutsoura 2015). These legal costs may make personal guarantees a less important factor for succession decisions for owner-managed companies.

These differences seem to make problems related to personal guarantees less relevant for CEO succession likelihood at owner-managed firms. Thus, we hypothesize the following:

Hypothesis 2 *The association between the share of outstanding loans without personal guarantees and CEO succession likelihood is weaker in owner-managed firms.*

Prevalence of family succession in the industry. Succession practices differ across industries. For example, in Japan, family succession, which refers to CEO succession wherein the previous and the new CEO have a family connection, is more common in the real estate, manufacturing, and restaurant industries, while recruiting CEOs from outside companies is more common in information and communication industries (Organization for Small and Medium Enterprises and Regional Innovation 2011). These differences in

succession practices may affect the relationship between personal guarantees and CEO succession.

On the one hand, personal guarantees may discourage family succession more than non-family succession. An incumbent CEO will care about their family members' welfare and may be reluctant to appoint a relative to be the new CEO if they know that the new CEO will face a significant financial risk due to personal guarantees. This argument leads to the following hypothesis:

Hypothesis 3a *The association between the share of outstanding loans without personal guarantees and CEO succession likelihood is stronger for firms in industries in which family succession is more common.*

On the other hand, it is often the case that family succession planning begins a long time before the actual succession occurs, and thus, a short-term financial decision such as taking out a loan with personal guarantees may not affect succession decisions as much. The best-known example of this is the tradition of first-son succession, which refers to a CEO appointing his/her first-born son to be the next CEO (Bennedsen et al. 2007). First-son successions are still common in Japan. According to a JFC 2020 survey, approximately 57% of SME family successions were first-son successions, compared with 10% of family successions being first-daughter successions.[14] The prevalence of first-son succession implies that family succession plans are likely to be predetermined (e.g., when a departing CEO's first child is born) and less likely to be affected by the existence of personal guarantees.

[14]See https://www.jfc.go.jp/n/findings/pdf/sme_findings200124.pdf for the survey (in Japanese).

Moreover, similar to owner-managed firms, family succession involves more legal constraints than non-family succession, such as inheritance tax (Bennedsen et al. 2015, Tsoutsoura 2015), and legal constraints to bequeathing minimal stakes to non-controlling heirs (Burkart et al. 2003, Ellul et al. 2010). These constraints may make personal guarantees a less important consideration for succession decisions. We therefore propose a hypothesis that contrasts with Hypothesis 3a, as follows:

Hypothesis 3b *The association between the share of outstanding loans without personal guarantees and CEO succession likelihood is weaker for firms in industries in which family succession is more common.*

3. The 2014 Guidelines for Personal Guarantee Provided by Business Owners

In the last couple of decades, the Japanese government has been trying to address concerns over the dark side of personal guarantees. For example, the Civil Code amendment of 2004 (effective April 1, 2005) required all guarantee contracts to be explicitly in writing and with terms of no longer than five years. In 2006, the government prohibited government financial institutions from requiring personal guarantees by a third party (such as friends and/or family of the business owner). The Financial Services Agency (FSA) also asked private-sector financial institutions to stop seeking personal guarantees from third parties.

The government's attack on the practice of Japanese banks requiring personal guarantees from business owners was intensified under the Abe administration (2012–2020), which viewed the practice as a major impediment

to business risk-taking in Japan and a source of long-lasting stagnation in the Japanese economy. With encouragement/pressure from the FSA and the Small and Medium Enterprises Agency of the Ministry of Economy, Trade, and Industry (METI), the Japan Bankers Association and Japan Chamber of Commerce developed the Guidelines for Personal Guarantee Provided by Business Owners in December 2013.[15] The guidelines ask SMEs to separate business assets from personal ones and strongly recommend banks not to require personal guarantees from SMEs that follow the guidelines. The guidelines also specify procedures for renegotiating or removing existing guarantees.[16] The guidelines became effective on February 1, 2014.

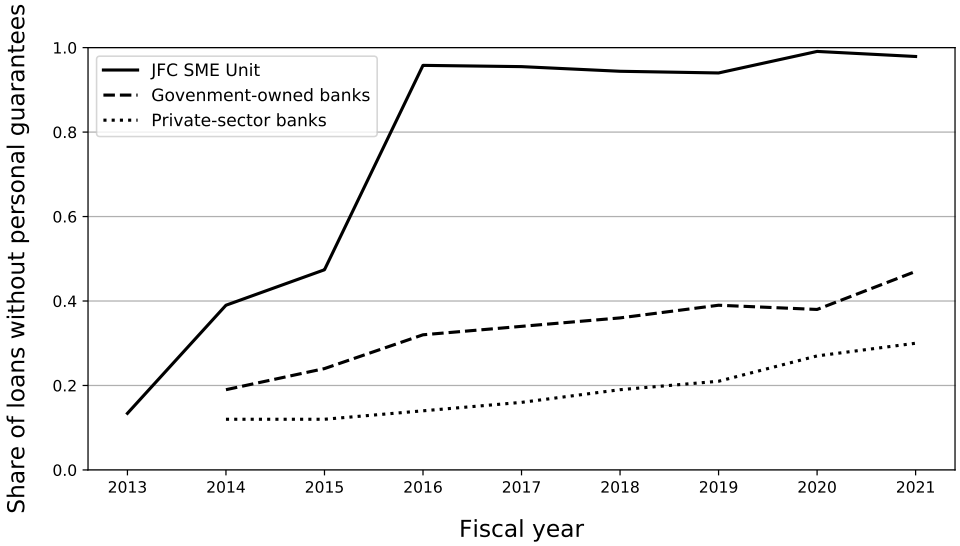
Although the guidelines are meant just as guiding principles and are not mandatory for banks, they have had an impact on Japanese bank practices. Figure 1 shows the proportion of new loans without personal guarantees at private-sector banks, government-owned banks, and the JFC SME Unit. For the private-sector and government-owned banks, the proportion of new loans without personal guarantees gradually increased after the introduction of the guidelines. By fiscal year 2019, the last fiscal year before the COVID-19 pandemic began, about 40% of the new loans made by government financial institutions and about 20% of those issued by private-sector banks were without personal guarantees.

The change was more dramatic for the SME Unit of the JFC, which is also shown in Figure 1. In the fiscal year 2013, only two months of which followed the implementation of the guidelines, the proportion of new loans issued without personal guarantees by the SME Unit was already as high as

[15]The guidelines (in Japanese) can be accessed from the FSA website: https://www.fsa.go.jp/news/25/ginkou/20131209-1.html.

[16]Despite their specified procedures for *existing* personal guarantees, the guidelines had very little effect in practice. For example, the guidelines were used to dissolve personal guarantees in only 207 cases by private financial institutions and in 61 cases by government-owned financial institutions in FY 2015. See https://www.fsa.go.jp/policy/hoshou_jirei/index.html for details.

Figure 1: Loans without personal guarantees after implementation of the guidelines



Note: This graph contains the proportion of new loans issued without personal guarantees by the JFC SME Unit, private-sector banks, and government-owned banks in Japan between the fiscal years of 2013 and 2021. Fiscal years start in April and end in March. The numbers for private-sector and government-owned banks come from the Small and Medium Enterprise Agency (https://www.chusho.meti.go.jp/kinyu/keieihosyou) and are only available from the 2014 fiscal year onwards. The numbers for the JFC SME unit are from the JFC (https://www.jfc.go.jp/n/company/sme/pdf/2022jfs.pdf).

13.4%. The proportion jumped to 39.0% in the fiscal year 2014 and 47.4% in the fiscal year 2015. Since April 2016, the SME Unit has stopped using personal guarantees almost entirely, and the proportion of new loans without personal guarantees has increased further, to approximately 95%.

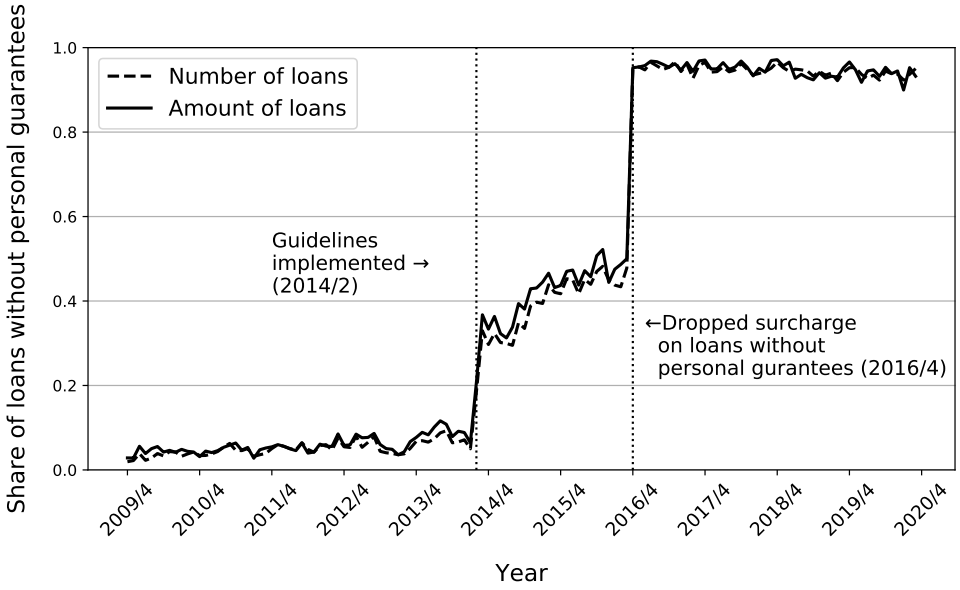
The immediate response by the SME Unit of the JFC is clearer in Figure 2, which shows the monthly proportion of newly issued loans without personal guarantees. The share (in terms of the number and the amount of loans) jumped to more than 30% in February 2014 from less than 10% prior to that month. Between February 2014 and March 2016, the SME Unit advanced approximately 40% of new loans without personal guarantees, while the rest still carried personal guarantees.

During the period between February 2014 and March 2016, all the companies that applied to the SME Unit for new loans were given the option of borrowing without personal guarantees, provided that they satisfied the conditions spelled out in the guidelines, such as a clear separation of company assets from the owner's personal assets and timely disclosure of financial information and business conditions. The JFC also imposed an interest surcharge of between 0.0% and 0.4% on loans without personal guarantees, which depended on JFC's internal credit ratings for the SMEs. Facing the choice between a loan with a personal guarantee but without a surcharge and another without a personal guarantee but with a surcharge, some borrowers chose traditional loans with personal guarantees during this period.

After April 2016, the JFC stopped requiring the surcharge on loans without personal guarantees, following which almost all new loans issued by the JFC SME Unit did not carry personal guarantees. In Figure 2, we observe that more than 90% of loans issued after April 2016 by the unit were without personal guarantees. The drastic change after April 2016 suggests that companies' choice between loans with and without personal guarantees largely depended on the interest surcharge.

Our analysis exploits the heterogeneity of firms between February 2014 and March 2016. During this period, some SMEs borrowed with personal guarantees, and some others borrowed without. We compare those two groups and examine how personal guarantees in loan contracts affected the firms' CEO succession likelihood after April 2016. In comparing the two groups that took out loans with and without personal guarantees, we control for the interest rate surcharge using JFC's internal credit rating data, which mechanically determined the surcharge. Furthermore, selection issues are dealt with by using loan program information and surveys (see Section 6).

Figure 2: JFC loans issued without personal guarantees



Note: This graph contains the monthly share of newly issued loans by the JFC SME Unit from April 2009 to April 2020. *Number of loans* measures the monthly share of newly issued loans without personal guarantees in the JFC SME Unit. *Amount of loans* measures the monthly share of the total amount of newly issued loans without personal guarantees in the JFC SME Unit. Both numbers come from JFC the SME Unit's anonymized loan-level data.

4. Data and Estimation Strategy

4.1 Data

We use an anonymized version of proprietary data from the JFC SME Unit to analyze the relationship between personal guarantees on business loans and CEO succession.[17] The JFC is a government-affiliated financial institution, and its SME Unit mainly issues long-term loans (more than seven years) for

[17]One of the authors (Hoshi) is a member of Policy Evaluation Study Group at the SME Unit and was allowed to access anonymized data to examine several research questions posed by the study group, including the inquiries in this paper.

Japanese SMEs.[18,19]

The dataset includes three types of information, namely information on individual loans, accounting information on SME borrowers, and information on the executives of the SMEs. The loan-level data include firm identifier, loan amount, loan contract date, maturity, interest rate, borrowing purpose (loan program), and other loan attributes, such as whether the loans come with personal guarantees.

The firm-level accounting data include the firm's financial statement information. From the accounting data, we use total debt and total equity to control for firms' debt-equity ratio in our main estimation. We use other accounting variables to control for necessary factors in our robustness check. The accounting information is available every fiscal year, typically ending in March for Japanese firms.

The executive data include the firm identifier, an indicator for whether the executive is a representative director or not, whether the executive is the president or not, the executive's demographic information (birth date, gender), and the company's shareholdings held by each executive. The executive data do not identify the CEOs of the companies, so we define a company's CEO by following the procedure suggested by Kokubo and Aya (2019). First, if an executive is a representative director and also a president, the executive is considered the CEO. Second, if the executive is the only representative director of the company, the executive is considered to be the CEO even when (s)he is not the president. The executive data are available every

[18]The JFC consists of three units, namely the SME, national life, and agricultural and fishery units. The national life unit covers small loans (on average, 7 million yen $\approx$ 70,000 USD) for households and self-employed workers.

[19]The definition of SMEs depends on which industry the firm is in. For example, SMEs in the manufacturing industry are defined as companies with less than 300 employees or equity of fewer than 300 million yen ($\approx$3 million USD). Please see https://www.jfc.go.jp/n/finance/search/pdf/chusho_chouki.pdf for more detail about the definition of SMEs at the JFC.

fiscal year ending in March.

We combine the loan and executive data through unique firm identifiers and analyze the relationship between personal guarantees on loans and the firms' CEO successions after April 2016. We restrict our sample to firms that borrowed from the JFC SME Unit between February 2014 and March 2016. We connect the loan-level data to executive data for fiscal years 2015 (ending in March 2016) to 2020 (ending in March 2021) to see whether firms that borrowed without personal guarantees before March 2016 had higher succession rates after April 2016.[20] Our sample includes more than $20,000$ Japanese firms that borrowed from the JFC SME Unit between February 2014 and March 2016 and has executive information in the database for every fiscal year from 2015 to 2020.

We remove firms that have borrowed from loan programs for CEO succession from our sample to deal with a part of selection bias. Firms that have a concrete plan for near-future CEO succession and require financing for implementing the succession plan can apply for the loan programs. When firms receive financing under these programs, they only use the loan amount for succession-related expenses. In our sample of firms that borrowed from the JFC SME Unit between February 2014 and March 2016, 108 firms did so with loan programs for CEO succession.

In addition to the main analysis, we examine two factors that might affect the relationship between personal guarantees and CEO succession, namely the difference in CEO shareholding and the prevalence of family succession by industry. To analyze the effect of CEO shareholding, we construct CEO's shareholding using the JFC executive data. To measure the prevalence of family succession in various industries, we use the TSR Business Successor Survey in 2018. In the survey, 140,000 randomly chosen firms that are registered for the TSR newsletter are asked whether they have concrete CEO suc-

[20] We detect CEO succession as the change in CEO birthday in our exective data.

cession plans. If a firm answers yes, it is asked if the planned successor is a family member, a non-family member inside the firm, or a non-family member from outside the firm. We construct an index for the prevalence of family succession in each industry by calculating the proportion of firms with family succession plans among the firms with succession plans for each Japan Standard Industry Code (JSIC). Both the TSR and JFC data use the JSIC, so we can connect the family succession index of TSR to the JFC at the industry level.

Table 1 summarizes the basic statistics of key variables in our analysis for our sample. In March 2016, the average share of JFC outstanding loans without personal guarantees held by sample firms was 32%. The average firm had 22 million JPY in assets, generated 19 million JPY in sales, and had 60 employees.[21] The average CEO's age was 57.3 years, and the average firm's age was 41.6 years. The average debt-to-equity ratio was 33.7%. The average credit rating was 3.4, on a scale of 1 to 12, where a smaller value indicates a better rating. Finally, CEO shareholding was 38% on average for the sample firms.

Table 2 presents the number of firms, the average share of JFC loans without personal guarantees in March 2016, and the share of firms that experienced CEO succession between March 2016 and March 2020 by industry. We aggregate the four-digit JSIC codes into 16 larger classifications for ease of presentation. Firms in our sample are drawn from a broad industry distribution. The top three industries in terms of the number of firms are manufacturing, wholesale and retail, and construction. The average portion of firms that experienced a change in CEO between March 2016 and March 2020 across all industries is 13.7%. The top three industries in terms of the highest CEO succession rates are finance and insurance (20%), scientific re-

[21] As of September 2022, 1 USD $\approx$ 140 JPY, which means that the average firm in our sample had \$0.15 million in assets and generated \$0.13 million in sales.

Table 1: Summary statistics

	# of firms	Mean	SD	10th	50th	90th
Share of outstanding loans without PG	24,677	0.323	0.395	0.000	0.000	1.000
Firm age	22,451	41.6	19.7	13.0	44.0	66.0
CEO age	20993	57.3	11.3	42.0	58.0	72.0
Assets (ten thousand JPY)	23,939	2206.8	3745.3	262.9	1126.6	4913.7
Sales (ten thousand JPY)	23,939	1906.4	3267.4	183.1	927.9	4374.2
Employment	24,656	59.9	107.4	4.0	32.0	136.0
Debt-to-equity ratio	23939	0.337	0.110	0.177	0.359	0.455
Credit rating (scale of 1 to 12)	24,420	3.4	2.0	1	3	6
CEO shareholding	20,993	0.380	0.318	0.000	0.330	0.900

Note: This table provides summary statistics for the main firm-level variables used in the econometric analysis. The unit of observation is the firm. *Share of outstanding loans without personal guarantees* is calculated as each firm's share of outstanding loans without personal guarantees. *Firm age* is the number of years from the year of establishment. *CEO age* is the CEO's age in years. *Assets* and *Sales* are the book value of total assets and sales in units of ten thousand Japanese yen. *Debt-to-equity ratio* is the book value of total loans from financial institutions over total equity. *Credit rating* is JFC's internal credit rating for the company on a scale of 1 to 12, where a smaller number indicates a better rating. *CEO Shareholding* is the company's shareholding held by its CEO. All the values are calculated at the point of March 2016.

search (17.6%), and transport and postal services (17.5%).

The top three industries in terms of a higher share of loans without personal guarantees are information and communication (45.7%), mining (41.3%), and services (36.0%). The manufacturing industry, the largest in our sample, also has a relatively high share of loans without personal guarantees (35.4%). The average share of firms with all their JFC loans issued *with* personal guarantees as of March 2016 is 56.1%, while the average share of firms with all their JFC loans *without* personal guarantees is 15.9%. We also present the distribution of share of loans without personal guarantees and CEO change by prefecture in Appendix A.3.

4.2 Estimation Strategy

Our primary interest is in whether receiving loans without personal guarantees is associated with a higher CEO succession rate. We estimate the following regression model to examine the relationship:

$$\text{CEO\_Change}_{f,i,r} = \alpha_1 \text{Share\_NoPG}_{f,i,r} + \alpha_2 \text{Control}_{f,i,r} + \phi_i + \varphi_r + \epsilon_{f,i,r}, \quad (1)$$

where subscript f denotes a firm, i denotes a JSIC 4-digit industry, and r denotes a prefecture.[22] $\text{CEO\_Change}_{f,i,r}$ is a dummy variable that equals one if firm f changed its CEO between April 2016 and March 2020, and zero otherwise. $\text{Share\_NoPG}_{f,i,r}$ is firm f's share of a JFC outstanding loan without personal guarantees as of March 2016 (see expression (2) below). Hypothesis 1 claims that a higher share of JFC outstanding loans without personal guarantees should be associated with a higher CEO succession rate, and thus, we expect the coefficient on $\text{Share\_NoPG}_{f,i,r}$, α_1, to be positive, if Hypothesis 1 is correct.

[22] Japan is divided into 47 prefectures, which are similar to states of the United States and form the country's top level of jurisdiction and administrative divisions.

Table 2: CEO succession and firms' share of loans without personal guarantees by industry

			Share of firms with		
Industry	**# of firms**	**Avg. Share NoPG**	**(Share NoPG = 0)**	**(Share NoPG = 1)**	**CEO change**
Accommodations	931	0.271	0.532	0.117	0.128
Agriculture, fisheries, and forestry	20	0.069	0.900	0.050	0.062
Construction	1924	0.241	0.654	0.138	0.147
Education	153	0.320	0.484	0.176	0.112
Electricity, gas, heat supply, and water	436	0.254	0.661	0.147	0.123
Finance and insurance	10	0.296	0.600	0.100	0.200
Information and communications	519	0.457	0.441	0.274	0.144
Personal services and entertainment	434	0.296	0.537	0.157	0.140
Manufacturing	10,317	0.354	0.436	0.148	0.149
Medical and health care	112	0.265	0.625	0.143	0.086
Mining	41	0.413	0.488	0.195	0.118
Real estate	1515	0.282	0.582	0.149	0.131
Scientific research	400	0.411	0.465	0.235	0.176
Services	764	0.360	0.505	0.213	0.157
Transport and postal services	1761	0.307	0.517	0.149	0.175
Wholesale and retail	5340	0.305	0.555	0.159	0.146
All	24,677	0.306	0.561	0.159	0.137

Note: This table presents the distribution of share of loans without personal guarantees and CEO change by the main industries. In the JFC data, firms are classified into four-digit JSIC codes, which we aggregate into 16 larger divisions to construct this table. *Avg. Share NoPG* is the average share of JFC loans without personal guarantees for firms in each industry. A share of firms with *(Share NoPG* $= 0$*)* is the portion of firms with their share of JFC loans without personal guarantees = 0, i.e., all the outstanding JFC loans were with personal guarantees, for each industry. A share of firms with *(Share NoPG* $= 1$*)* is the portion of firms with their share of JFC loans without personal guarantees = 1, i.e., all their outstanding JFC loans were without personal guarantees, for each industry. A share of firms with *CEO change* is the portion of firms that experienced CEO change between April 2016 and March 2020 in each industry. All the variables except the share of firms with CEO change were measured in March 2016.

We control for variables that may affect firms' succession decisions and that may correlate with firms' share of loans without personal guarantees. First, we control for CEO age (as of March 2016), which is known to be one of the most important determinants of CEO succession. Second, we control for the debt-to-equity ratio. If a company owes a large amount of financial debt, a potential successor may hesitate to take it over, regardless of the personal guarantee status. The debt-to-equity ratio is calculated as total debt (including debt from financial institutions other than the JFC) over total equity as of March 2016.

Finally, we control for the internal rating of the firm by the JFC because highly rated firms, which have a lower interest surcharge when borrowing without personal guarantees, may be more likely to choose loans without personal guarantees and to conduct CEO succession. The internal rating classifies firms into 12 categories. The rating variable takes 1 for the firms in the highest rated category and 12 for those in the lowest rated categories. In addition, we control for industry-specific variations by including industry dummy ϕ_i, and for prefecture-specific variations by including prefecture dummy φ_r in the regression.

In an alternative specification of the model, we replace Share_NoPG with two dummy variables, namely Some_NoPG and All_NoPG. *Some_NoPG* equals one if the firm has at least one JFC outstanding loan without personal guarantees and zero if all the JFC outstanding loans are with personal guarantees (see expression (3)) as of March 2016. The coefficient on Some_NoPG measures how much more likely a firm with at least one JFC outstanding loan without personal guarantees is to experience CEO succession, compared with firms with no JFC loans without personal guarantees.

All_NoPG equals one if all the JFC outstanding loans are without personal guarantees as of March 2016 and zero otherwise (see expression (4)). The coefficient for All_NoPG measures how much more likely a firm with all its

JFC outstanding loans without personal guarantees is to experience a CEO succession, compared with other firms. We expect coefficients on these two dummy variables to be positive.

$$\text{Share\_NoPG} = \frac{(\text{JFC outstanding loans without PG in 2016/3})}{(\text{Total JFC outstanding loans in 2016/3})}, \tag{2}$$

$$\text{Some\_NoPG} = \begin{cases} 1 & \text{if Share\_NoPG} > 0 \\ 0 & \text{if Share\_NoPG} = 0 \end{cases}, \tag{3}$$

$$\text{All\_NoPG} = \begin{cases} 1 & \text{if Share\_NoPG} = 1 \\ 0 & \text{if Share\_NoPG} < 1 \end{cases}. \tag{4}$$

One caveat of our estimation strategy is that firms that took out JFC loans without personal guarantees may have increased non-JFC loans with personal guarantees. CEOs typically cannot pledge the same personal assets for different personal guarantee contracts. Thus, if firms take out JFC loans without personal guarantees, they may want to take out another loan with CEOs' unpledged personal assets to raise more financing. If so, Share_NoPG defined by (2) underestimates CEOs' exposure to personal guarantees.

To deal with this issue, in Appendix A.2, we conduct a robustness check using an alternative estimation strategy whereby Share_NoPG is calculated as JFC outstanding loans without personal guarantees over total outstanding loans (including non-JFC financial institutions).[23] The estimation result shown in Section §5did not change qualitatively using the alternative estimation strategy.

[23]Given that non-JFC financial institutions had a low rate of lending without personal guarantees before March 2016, as shown in Figure 1, we assume that non-JFC outstanding loans as of March 2016 were with personal guarantees.

5. Estimation Results

5.1 Personal guarantees and CEO succession

We start by investigating the effects of personal guarantees on CEO succession (Hypothesis 1). Table 3 presents the estimation results for the variants of the regressions specified by expression (1). The dependent variable is a dummy variable that represents CEO changes. The regressions in Columns 1–3 examine the CEO changes that took place between April 2016 and March 2020 (dummy = 1 if there is at least one CEO change between 2016/4 and 2020/3). Columns 4–6 look at the CEO changes that took place within two years after the period, during which a significant portion of borrowers received loans from the JFC without personal guarantees (dummy = 1 if there is at least one CEO change between 2016/4 and 2018/3).

In all specifications, the coefficients on the share or dummies for loans without personal guarantees (Share_NoPG, Some_NoPG, and All_NoPG) are positive and significant, suggesting that firms relying less on personal guarantees are more likely to experience CEO succession, consistent with Hypothesis 1. The signs of coefficients on control variables are as expected. Positive coefficients on (the log of) CEO age imply that firms with older CEOs are more likely to experience CEO succession. Negative coefficients on rating suggest that firms with higher internal ratings (thus, lower values of rating) are more likely to conduct succession.

The coefficient estimate on Share_NoPG in Column 1 is 0.029 (with a standard error of 0.007), indicating that firms with all JFC loans without personal guarantees are 2.9 percentage points more likely to change CEOs in the following four years, compared with firms with no JFC loans without personal guarantees. Given that the total succession rate in those four years is 13.7% in our sample, the difference in the share of loans without personal

guarantees can explain more than 20% of the variation in CEO succession at the extreme.

Columns 2 and 3 use Some_NoPG and All_NoPG, respectively, in place of Share_NoPG. The estimated coefficients on those dummies are 0.021 and 0.024, respectively, with standard errors of 0.004 and 0.008. The positive coefficient of Some_NoPG indicates that if a firm has some loans without personal guarantees, the firm is more likely to conduct CEO succession, compared with firms with no loans without personal guarantees. The positive coefficient of All_NoPG indicates that if all of a firm's JFC loans are without personal guarantees, the firm is more likely to experience CEO succession.

5.2 Owner-managed firms

Several factors can potentially affect the relationship between personal guarantees and CEO succession found in Section §5.1. As owner-managed firms encounter more practical and emotional hurdles when replacing CEOs than non-owner-managed firms, reducing reliance on personal guarantees may have a smaller effect on owner-managed firms' succession. Owner-managed firms account for a large share of SMEs in Japan. In our sample, for example, 35% of the firms have CEOs with more than 50% of the company's shareholdings.

Columns 1–6 of Table 4 present the regression results of CEO change on the firm's reliance on personal guarantees for firms with different ownership structures. Columns 1–3 present the regression results for the sample of firms with more than 50% of CEO shareholding, and Columns 4–6 report the results for the sample of firms with less than 50% of CEO shareholding. Consistent with the baseline regressions, we find that the share of firms' loans without personal guarantees positively correlates with firms' CEO succession. We also find that the effect of reducing reliance on personal guaran-

Table 3: Personal guarantees and CEO succession

	Dependent variable: CEO Change					
	Whole sample (2016/4–2020/3)			First two years (2016/4-2018/3)		
Dependent variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Share No PG	0.0297			0.0113		
	(0.00753)			(0.00363)		
Some No PG		0.0204			0.0102	
		(0.00497)			(0.00279)	
All No PG			0.0248			0.00596
			(0.00879)			(0.00380)
ln(CEO Age)	0.480	0.479	0.480	0.232	0.231	0.232
	(0.0154)	(0.0154)	(0.0155)	(0.00974)	(0.00973)	(0.00976)
Debt-equity Ratio	-0.00982	-0.0231	-0.0133	0.0185	0.0145	0.0144
	(0.0296)	(0.0272)	(0.0310)	(0.0232)	(0.0228)	(0.0233)
Rating	-0.00484	-0.00473	-0.00558	-0.00277	-0.00262	-0.00307
	(0.00135)	(0.00140)	(0.00136)	(0.00131)	(0.00131)	(0.00131)
Prefecture FE	Yes	Yes	Yes	Yes	Yes	Yes
JSIC 4-digit FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20,270	20,270	20,270	20,270	20,270	20,270
R^2	0.125	0.125	0.125	0.082	0.083	0.082

Standard errors in parentheses.

Notes: This table presents the results of OLS regressions examining how firms' share of loans without personal guarantees are related to CEO succession. We exclude firms that took out the loans for business succession programs from our sample. Independent variables are dummies for CEO change during whole sample (2016/4–2020/3) and the first two years of our sample (2016/4–2020/3). *Share_NoPG* is each firm's share of JFC loans without personal guarantees. *Some_NoPG* is a dummy for firms with a positive share of JFC loans without personal guarantees. *All_NoPG* is a dummy for firms with a 100% share of JFC loans without personal guarantees. *ln(CEO Age)* is the natural log of CEO age. *Debt-equity-Ratio* is calculated as total debt over total equity. *Rating* is JFC's internal credit rating for the company in the scale of 1 to 12, where a smaller number indicates a better rating. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and clustered across JSIC industries and prefectures. All the independent variables were measured in March 2016. The level of analysis is at the firm level.

tees for business succession is less pronounced for firms with higher CEO ownership. The coefficients of Share_NoPG, Some_NoPG, and All_NoPG are all smaller for firms with more than 50% CEO shareholding. For example, the coefficient estimate of the share of loans without personal guarantees of the sample of firms with more than 50% CEO shareholding is 0.018 (with a standard error of 0.009), while the estimate for the sample of firms with less than 50% CEO shareholding is 0.032 (with a standard error of 0.010).

Columns 7–9 further confirm the point by adding the interaction terms of the NoPG variables and CEO shareholding in the estimation. Most importantly, the coefficients of the interaction terms between NoPG variables and CEO shareholding are all negative and significant, which indicates that the effect of reducing personal guarantees on CEO succession is smaller for firms with higher CEO shareholding. The coefficients of CEO shareholding are negative, suggesting that firms with a higher CEO shareholding are less likely to conduct CEO succession. Overall, the results in Table 4 are consistent with Hypothesis 2.

5.3 Industries in which family succession is common

Next, we analyze how the prevalence of family succession in the industry influences the relationship between personal guarantees and CEO succession. As we argued in Section 2, whether the effect of personal guarantees is larger or smaller on family succession is ambiguous. On the one hand, a departing CEO will care more about the well-being of the successor CEO, who will be a family member. Then, the potential financial burden implied by personal guarantees can further inhibit family succession. On the other hand, family succession planning may start much earlier than that for non-family succession. This may make family succession less dependent on short-term financial changes, such as the enhanced opportunity to receive loans with-

Table 4: Personal guarantees and CEO shareholding

	Dependent variable: CEO Change (2016/4–2020/3)								
	Firms with its CEO shareholding $\geq$ 50%			Firms with its 50% CEO shareholding $<$ 50%			Whole sample		
Independent variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
CEO Shareholding							-0.0775	-0.0779	-0.0864
							(0.0112)	(0.0119)	(0.0102)
Share No PG	0.0177			0.0337			0.0409		
	(0.00981)			(0.0103)			(0.0107)		
× CEO shareholding							-0.0349		
							(0.0173)		
Some No PG		0.0140			0.0225			0.0264	
		(0.00775)			(0.00705)			(0.00776)	
× CEO shareholding								-0.0214	
								(0.0132)	
All No PG			0.0170			0.0267			0.0296
			(0.0137)			(0.0105)			(0.0126)
× CEO shareholding									-0.0162
									(0.0242)
ln(CEO Age)	0.393	0.393	0.394	0.527	0.527	0.527	0.484	0.483	0.484
	(0.0252)	(0.0253)	(0.0252)	(0.0212)	(0.0212)	(0.0215)	(0.0157)	(0.0157)	(0.0158)
Debt-equity Ratio	0.0501	0.0450	0.0496	0.00429	-0.0128	-0.000625	0.0313	0.0169	0.0275
	(0.0468)	(0.0460)	(0.0471)	(0.0311)	(0.0279)	(0.0326)	(0.0282)	(0.0260)	(0.0296)
Rating	-0.00733	-0.00718	-0.00770	-0.00363	-0.00357	-0.00455	-0.00442	-0.00435	-0.00512
	(0.00207)	(0.00209)	(0.00206)	(0.00155)	(0.00159)	(0.00151)	(0.00132)	(0.00136)	(0.00133)
Prefecture FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
JSIC 4-digit FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7103	7103	7103	12,971	12,971	12,971	20,270	20,270	20,270
R^2	0.161	0.161	0.161	0.148	0.148	0.148	0.131	0.131	0.131

Standard errors in parentheses.

Notes: This table presents the result of OLS regressions examining how the relationship between firms' share of loans without personal guarantees and CEO succession differs across different degrees of CEO ownership. We exclude firms that took out the loans for business succession programs from our sample. The dependent variable is the dummy for CEO change between 2016/4 and 2020/3. Columns 1–3 include the sample of firms with CEOs holding more than 50% shareholding, and Columns 4–6 include the sample of of firms with CEOs holding less than 50% shareholding. *CEO Shareholding* is the share of CEO shareholding in the company. Other independent variables follow definitions in the footnote of Table 3. All the independent variables were measured in March 2016. Standard errors (in brackets) are robust to arbitrary heteroscedasticity and clustered across JSIC industries and prefectures. The level of analysis is at the firm level.

out personal guarantees.

Columns 1–6 of Table 5 present the estimation results of CEO change on personal guarantees for firms in industries with various levels of family succession. Columns 1–3 are the results for firms in industries with above-average family succession rates ($> 69.5\%$). Columns 4–6 are the results for firms in industries with below-average family succession rates ($\leq 69.5\%$). The coefficient estimates of Share_NoPG, Some_NoPG, and All_NoPG are all smaller for firms in industries with above-average family succession rates. For example, the coefficient estimate of the share of loans without personal guarantees for the sample of firms in industries with high family succession rates is 0.026 (with a standard error of 0.009), while the coefficient estimate for the firms in industries with low family succession rates is 0.035 (with a standard error of 0.009).

Columns 7–9 further confirm the point by adding the interaction terms between the NoPG variables and industry-level family succession rates. Industry fixed effect is excluded in these regressions. The coefficient estimates of the interaction terms are all negative and significant, suggesting that the effect of reduced reliance on personal guarantees on CEO succession is smaller for firms in industries with higher family succession rates. Thus, the results in Table 5 align with Hypothesis 3b, in which we argue that family succession involves a long-term succession planning and is less dependent on short-term financial changes, such as personal guarantees.

6. Survey Evidence

6.1 Survey background

The results in Section 5 suggest that taking out bank loans without personal guarantees is associated with a higher subsequent succession rate. The anal-

Table 5: Personal guarantees and industries with various family succession rates

	Dependent variable: CEO Change (2016/4–2020/3)								
	Industries > avg. family succession rate			Industries ≤ avg. family succession rate			Whole sample		
Independent variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Share Family Succession							-0.00966	-0.0151	-0.0176
							(0.0223)	(0.0264)	(0.0193)
Share No PG	0.0276			0.0343			0.0743		
	(0.00899)			(0.0101)			(0.0252)		
× Share Family Succession							-0.0595		
							(0.0361)		
Some No PG		0.0216			0.0185			0.0484	
		(0.00588)			(0.00786)			(0.0271)	
× Share Family Succession								-0.0374	
								(0.0394)	
All No PG			0.0190			0.0361			0.0832
			(0.00894)			(0.0147)			(0.0290)
× Share Family Succession									-0.0813
									(0.0399)
ln(CEO Age)	0.480	0.480	0.480	0.479	0.479	0.480	0.479	0.478	0.480
	(0.0203)	(0.0202)	(0.0202)	(0.0186)	(0.0188)	(0.0188)	(0.0143)	(0.0144)	(0.0144)
Debt-equity Ratio	-0.0371	-0.0477	-0.0433	0.0367	0.0177	0.0386	-0.0256	-0.0408	-0.0298
	(0.0379)	(0.0365)	(0.0394)	(0.0667)	(0.0669)	(0.0674)	(0.0267)	(0.0241)	(0.0272)
Rating	-0.00359	-0.00338	-0.00433	-0.00711	-0.00716	-0.00788	-0.00413	-0.00392	-0.00503
	(0.00177)	(0.00186)	(0.00170)	(0.00313)	(0.00307)	(0.00312)	(0.00117)	(0.00122)	(0.00115)
Prefecture FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
JSIC 4-digit FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Observations	13,332	13,332	13,332	6938	6938	6938	20,385	20,385	20,385
R^2	0.122	0.122	0.122	0.140	0.140	0.140	0.083	0.083	0.082

Standard errors in parentheses

Notes: This table presents the result of OLS regressions examining how the relationship between firms' share of loans without personal guarantees and CEO succession differs across industries with various family succession rates. We exclude firms that took out the loans for business succession programs from our sample. The dependent variable is the dummy for CEO change between 2016/4 and 2020/3. Columns 1–3 include the sample of firms in industries where family succession rates are above average (69.5%), and Columns 4–6 include the sample of firms in industries where family succession rates were below average (69.5%). *Share Family Succession* is the industry-level family succession rates in the TSR Business Successor Survey in 2018. Other independent variables follow definitions in the footnote of Table 3. All the independent variables were measured in March 2016. In Columns 7–9 (1–6), standard errors are robust to arbitrary heteroscedasticity and clustered across JSIC industries and prefectures. The level of analysis is at the firm level.

ysis, however, cannot identify the direction of causality. There are two potential directions. The first is that SMEs that were about to conduct CEO succession were more likely to borrow without personal guarantees. The second is that taking out loans without personal guarantees encourages business owners to leave their companies to their successors.

To analyze the direction of causality, we conducted a survey of Japanese SMEs in September 2022 in cooperation with TSR. We sent an online survey to firms that subscribed to receive TSR publications. We targeted the firms that conducted CEO succession during the period of April 2016 to March 2021, which corresponds to our sample period in the estimation. We gathered responses from a total of 601 firms; that is approximately 3% of all the firms that subscribed to the TSR publication and experienced CEO succession during the sample period.

The survey asked firms that had experienced CEO succession during our sample period whether they had taken out bank loans without personal guarantees from April 2014 to March 2016 and, if so, if they had done so primarily to ease their CEO succession. If a company answered yes to both questions, it implied that the first direction of causality had come into place for the company.

Furthermore, we asked firms that borrowed without personal guarantees for primary reasons other than CEO succession if borrowing without personal guarantees nonetheless resulted in facilitating their succession. If a company answered that borrowing without personal guarantees indeed facilitated the succession, even though succession was not the primary reason, it implied that the second direction of causality had taken place for the company.

6.2 Survey results

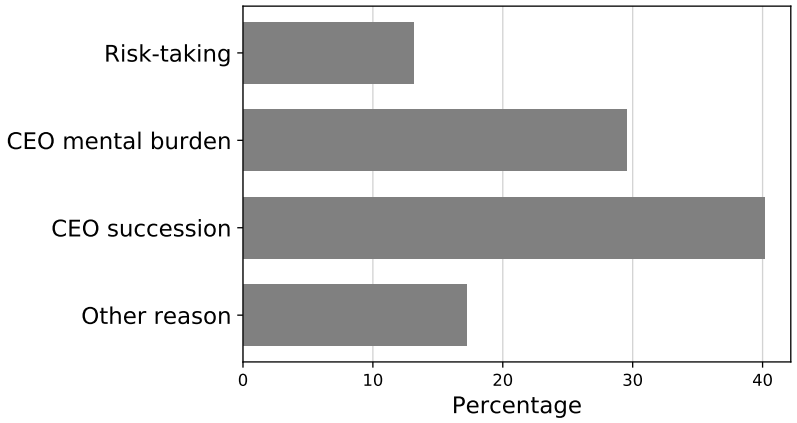
First, we found that 28.5% of the surveyed firms had received bank loans without personal guarantees between February 2014 and March 2016. Of those, 23.3% had borrowed from the JFC, 12.0% from other government financial institutions, and 81.2% from private-sector banks (multiple responses were allowed in this question).

Second, we asked firms that had borrowed without personal guarantees before CEO succession about the primary reason for taking out loans without personal guarantees. Figure 3 summarizes the results. Approximately 40% of the firms answered that the primary reason was to ease CEO succession. For these firms, the causality seems to run from CEO succession to loan without personal guarantees, rather than the other way around. Approximately 13% of the firms answered that they had borrowed without personal guarantees to finance more risky projects than before, and 29% answered that they had aimed to reduce psychological burden for their CEOs. Some firms responded that their relationship lenders did not require personal guarantees. Some other firms just detailed the use of the loans, such as financing working capital and equipment purchase. These responses have been classified as "other reasons."

Finally, we asked the firms that had borrowed without personal guarantees before CEO succession whether doing so had facilitated succession. Figure 3 shows the results separately for the firms that had borrowed without personal guarantees mainly to ease CEO succession and those that had other primary purposes.[24] More than 80% of the firms that had borrowed without personal guarantees primarily for CEO succession stated that the lack of personal guarantees had indeed facilitated succession. Even for firms that had borrowed without guarantees primarily for purposes other than succession,

[24]Other primary purposes include risk-taking, reduction of psychological burden, and others.

Figure 3: Primary reasons for borrowing without personal guarantees

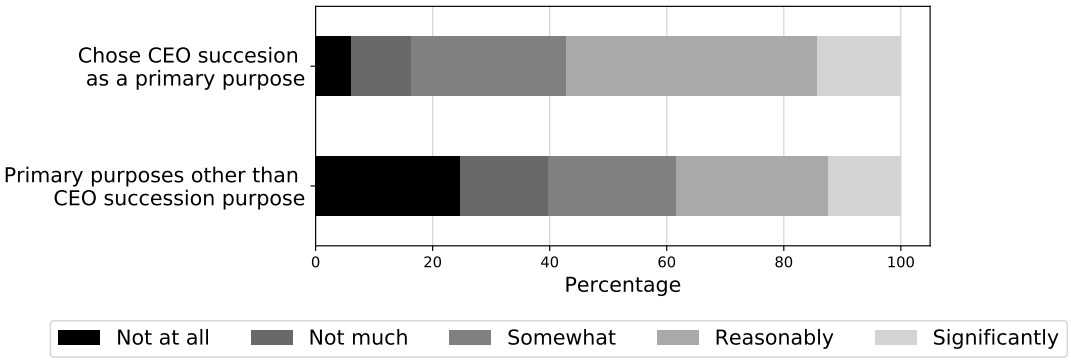


Note: This graph summarizes the answers of 133 surveyed SMEs that took out bank loans without personal guarantees between 2014/2 and 2016/3 and conducted CEO succession between 2016/4 and 2020/3. The survey question was "What was the reason for borrowing without personal guarantees? Please choose the closest reason." *Risk-taking* is for firms that took out loans without personal guarantees primarily because doing so would help them take more risky strategic decisions. *CEO mental burden* is for firms that took out loans without personal guarantees primarily because doing so would help ease their CEOs' mental burden. *CEO succession* is for firms that took out loans without personal guarantees primarily because doing so would help them conduct CEO succession later. *Other reason* is for firms that specified different primary reasons. Multiple answers were not allowed for this question.

80% said that borrowing without personal guarantees facilitated succession. The latter result reinforces the argument that there exists a causal effect of borrowing without personal guarantees on CEO succession.

In summary, the survey results suggest that the causality runs both ways. Some firms took out loans without personal guarantees to facilitate CEO succession that they had already planned. Some other firms borrowed without personal guarantees for purposes other than CEO succession but found *ex-post* that their CEO succession was made easier because of the absence of personal guarantees on their existing loans.

Figure 4: Did borrowing without personal guarantees facilitate CEO succession?



Note: This graph summarizes the answers of 133 surveyed SMEs that took out bank loans without personal guarantees between 2014/2 and 2016/3 and conducted CEO succession between 2016/4 and 2020/3. The survey question was "How much did borrowing without personal guarantees facilitate the subsequent business succession?" Multiple answers were not allowed for this question. The first bar shows the distribution of answers by SMEs that had borrowed without personal guarantees primarily for succession. The second bar shows the distribution of answers for those that had a primary reason other than CEO succession. Other primary purposes included risk-taking, reduction of psychological burden, and others.

7. Conclusion

In a rapidly aging society such as Japan's, securing smooth succession in viable businesses is important for maintaining economic growth. The practice by Japanese banks to require SME managers to pledge personal guarantees for business loans has been blamed as a serious impediment to CEO succession. Removing the impediment was one of the aims of the 2014 Guidelines for Personal Guarantee Provided by Business Owners, which asks lenders not to rely on personal guarantees as long as borrowers clearly distinguished their business assets from their personal ones.

Using SME loan data from a government financial institution in Japan, this paper examined the relationship between personal guarantee agreements on bank loans by SME managers and their CEO succession. We found that receiving loans without personal guarantees increases SMEs' CEO suc-

cession. We also found that the impact of personal guarantees on CEO succession is moderated for owner-managed firms and firms in industries in which family succession is more common. The results suggest that owner-managers and those who plan for their family members succeed them are less encumbered by the presence of personal guarantees, maybe because they are more determined.

We also conducted a corporate survey that asked for the primary reasons for borrowing without personal guarantees and if they had facilitated CEO succession. The survey results suggest that the causality between borrowing without personal guarantees and CEO succession runs both ways. Some firms took out loans without personal guarantees to facilitate CEO succession, and others found that their business succession was made easier by receiving loans without personal guarantees.

Overall, our findings confirm that the common practice of requiring SME owners to pledge personal guarantees tends to inhibit smooth CEO succession, which was one of the crucial rationales for establishing the Japanese guidelines. But it was not the only one. Another rationale was that personal guarantees discourage entrepreneurial risk-taking and prevent the development of a dynamic economy. We will leave the analysis of the relationship between corporate risk-taking and personal guarantees and other potential impacts of requiring personal guarantees by SME owners on their corporate strategies for future research.

References

Adner, Ron and Constance E Helfat, "Corporate effects and dynamic managerial capabilities," *Strateg Manag J*, 2003, *24* (10), 1011–1025.

Bates, Thomas W, Kathleen M Kahle, and René M Stulz, "Why do US firms hold so

much more cash than they used to?," *J Finance*, 2009, *64* (5), 1985–2021.

Belenzon, Sharon, Anastasiya Shamshur, and Rebecca Zarutskie, "CEO's age and the performance of closely held firms," *Strateg Manag J*, 2019, *40* (6), 917–944.

Bena, Jan and Ting Xu, "Competition and ownership structure of closely held firms," *Rev Financ Stud*, 2017, *30* (5), 1583–1626.

Benmelech, Efraim, Nitish Kumar, and Raghuram Rajan, "The decline of secured debt," Technical Report, NBER 2020.

Bennedsen, Morten, Joseph PH Fan, Ming Jian, and Yin-Hua Yeh, "The family business map: Framework, selective survey, and evidence from Chinese family firm succession," *J Corp Finance*, 2015, *33*, 212–226.

__ , Kasper Meisner Nielsen, Francisco Pérez-González, and Daniel Wolfenzon, "Inside the family firm: The role of families in succession decisions and performance," *Q J Econ*, 2007, *122* (2), 647–691.

Berns, Kristin VD and Patricia Klarner, "A review of the CEO succession literature and a future research program," *Academy of Management Perspectives*, 2017, *31* (2), 83–108.

Bester, Helmut, "The role of collateral in a model of debt renegotiation," *J Money Credit Bank*, 1994, *26* (1), 72–86.

Boeker, Warren, "Power and managerial dismissal: Scapegoating at the top," *Adm Sci Q*, 1992, pp. 400–421.

Brush, Thomas H, Philip Bromiley, and Margaretha Hendrickx, "The free cash flow hypothesis for sales growth and firm performance," *Strateg Manag J*, 2000, *21* (4), 455–472.

Burkart, Mike, Fausto Panunzi, and Andrei Shleifer, "Family firms," *J Finance*, 2003, *58* (5), 2167–2201.

Cannella, Sydney Finkelstein Bert, Donald C Hambrick, Sydney Finkelstein, and Albert A Cannella, *Strategic leadership: Theory and research on executives, top management teams, and boards*, Strategic Management, 2009.

Chaganti, Rajeswararao and Fariborz Damanpour, "Institutional ownership, capital structure, and firm performance," *Strateg Manag J*, 1991, *12* (7), 479–491.

Chava, Sudheer, Vikram Nanda, and Steven Chong Xiao, "Lending to innovative firms," *The Review of Corporate Finance Studies*, 2017, *6* (2), 234–289.

Claessens, Stijn, Simeon Djankov, and Larry HP Lang, "The separation of ownership and control in East Asian corporations," *J Financ Econ*, 2000, *58* (1-2), 81–112.

Cucculelli, Marco and Giacinto Micucci, "Family succession and firm performance: Evidence from Italian family firms," *J Corp Finance*, 2008, *14* (1), 17–31.

Denis, David J and Diane K Denis, "Majority owner-managers and organizational efficiency," *J Corp Finance*, 1994, *1* (1), 91–118.

Dobrev, Stanislav D and William P Barnett, "Organizational roles and transition to entrepreneurship," *Acad Manage J*, 2005, *48* (3), 433–449.

Durand, Rodolphe and Vicente Vargas, "Ownership, organization, and private firms' efficient use of resources," *Strateg Manag J*, 2003, *24* (7), 667–675.

Eckbo, B Espen and Karin S Thorburn, "Control benefits and CEO discipline in automatic bankruptcy auctions," *J Financ Econ*, 2003, *69* (1), 227–258.

_ , _ , and Wei Wang, "How costly is corporate bankruptcy for the CEO?," *J Financ Econ*, 2016, *121* (1), 210–229.

Eisdorfer, Assaf, "Empirical evidence of risk shifting in financially distressed firms," *J Finance*, 2008, *63* (2), 609–637.

Ellul, Andrew, Marco Pagano, and Fausto Panunzi, "Inheritance law and investment in family firms," *Amer Econ Rev*, 2010, *100* (5), 2414–50.

Fattoum-Guedri, Asma, Frédéric Delmar, and Mike Wright, "The best of both worlds: Can founder-CEOs overcome the rich versus king dilemma after IPO?," *Strateg Manag J*, 2018, *39* (13), 3382–3407.

Fitza, Markus and Laszlo Tihanyi, "How much does ownership form matter?," *Strateg Manag J*, 2017, *38* (13), 2726–2743.

Hambrick, Donald C, "Upper echelons theory: An update," 2007.

__ and Phyllis A Mason, "Upper echelons: The organization as a reflection of its top managers," *Acad Manage Rev*, 1984, *9* (2), 193–206.

Hessels, Jolanda, Cornelius A Rietveld, A Roy Thurik, and Peter Van der Zwan, "Depression and entrepreneurial exit," *Academy of Management Perspectives*, 2018, *32* (3), 323–339.

Hochberg, Yael V, Carlos J Serrano, and Rosemarie H Ziedonis, "Patent collateral, investor commitment, and the market for venture lending," *J Financ Econ*, 2018, *130* (1), 74–94.

Huson, Mark R, Paul H Malatesta, and Robert Parrino, "Managerial succession and firm performance," *J Financ Econ*, 2004, *74* (2), 237–275.

Japan Industry Review, "Japan Ramps up Business Succession Support Amid Aging Owners," 2017. Accessed on March 3rd, 2022 from https://www.japanindustrynews.com/2017/07/japan-ramps-business-succession-support-amid-aging-owners/.

Kamei, Katsuyuki, Yuki Ohisa, and Shinya Kaneko, "Chusho-kigyo Keieisha no mental health and risk management," *Risk and Management*, 2011, *42*, 7–23.

Karaevli, Ayse and Edward J Zajac, "When do outsider CEOs generate strategic change? The enabling role of corporate stability," *Journal of Management Studies*, 2013, *50* (7), 1267–1294.

Kato, Takao and Cheryl Long, "Executive turnover and firm performance in China," *Amer Econ Rev*, 2006, *96* (2), 363–367.

Kokubo, Kinya and Takanori Aya, "Empirical study for CEO's carrer path in Japanese companies," 2019.

Lee, Khai Sheang, Guan Hua Lim, and Wei Shi Lim, "Family business succession: Appropriation risk and choice of successor," *Acad Manage Rev*, 2003, *28* (4), 657–666.

Ma, Song, Joy Tianjiao Tong, and Wei Wang, "Bankrupt innovative firms," *Manage Sci*, 2022, *68* (9), 6971–6992.

Mann, William, "Creditor rights and innovation: Evidence from patent collateral," *J Financ Econ*, 2018, *130* (1), 25–47.

Mannor, Michael J, Adam J Wowak, Viva Ona Bartkus, and Luis R Gomez-Mejia, "Heavy lies the crown? How job anxiety affects top executive decision making in gain and loss contexts," *Strateg Manag J*, 2016, *37* (9), 1968–1989.

Mehrotra, Vikas, Randall Morck, Jungwook Shim, and Yupana Wiwattanakantang, "Adoptive expectations: Rising sons in Japanese family firms," *J Financ Econ*, 2013, *108* (3), 840–854.

Nelson, Teresa, "The persistence of founder influence: Management, ownership, and performance effects at initial public offering," *Strateg Manag J*, 2003, *24* (8), 707–724.

Nini, Greg, David C Smith, and Amir Sufi, "Creditor control rights and firm investment policy," *J Financ Econ*, 2009, *92* (3), 400–420.

_ , _ , and _ , "Creditor control rights, corporate governance, and firm value," *Rev Financ Stud*, 2012, *25* (6), 1713–1761.

Organization for Small and Medium Enterprises and Regional Innovation, "Business Succession Survey Report," 2011. Accessed on March 3rd, 2022 https://www.smrj.go.jp/doc.

Parsons, Chris and Sheridan Titman, "Capital structure and corporate strategy," in "Handbook of empirical corporate finance," Elsevier, 2008, pp. 203–234.

Pérez-González, Francisco, "Inherited control and firm performance," *Amer Econ Rev*, 2006, *96* (5), 1559–1588.

Porta, Rafael La, Florencio Lopez de Silanes, and Andrei Shleifer, "Corporate ownership around the world," *J Finance*, 1999, *54* (2), 471–517.

Powell, E Erin and Ted Baker, "It's what you make of it: Founder identity and enacting strategic responses to adversity," *Acad Manage J*, 2014, *57* (5), 1406–1433.

Quigley, Timothy J and Donald C Hambrick, "When the former CEO stays on as board chair: Effects on successor discretion, strategic change, and performance," *Strateg Manag J*, 2012, *33* (7), 834–859.

Roberts, Michael R and Amir Sufi, "Financial contracting: A survey of empirical research and future directions," *Annu. Rev. Financ. Econ.*, 2009, *1* (1), 207–226.

Rouzet, Dorothée, Aida Caldera Sánchez, Theodore Renault, and Oliver Roehn, "Fiscal challenges and inclusive growth in ageing societies," 2019, (27).

Schulze, William and Thomas Zellweger, "Property rights, owner-management, and value creation," *Acad Manage Rev*, 2021, *46* (3), 489–511.

Serfling, Matthew A, "CEO age and the riskiness of corporate policies," *J Corp Finance*, 2014, *25*, 251–273.

Strebulaev, Ilya A and Baozhong Yang, "The mystery of zero-leverage firms," *J Financ Econ*, 2013, *109* (1), 1–23.

Thakor, Anjan V and Gregory F Udell, "Secured lending and default risk: equilibrium analysis, policy implications and empirical results," *The Economic Journal*, 1991, *101* (406), 458–472.

Tsoutsoura, Margarita, "The effect of succession taxes on family firm investment: Evidence from a natural experiment," *J Finance*, 2015, *70* (2), 649–688.

Wasserman, Noam, "Inside the black box of entrepreneurial incentives," Technical Report, Working paper, Harvard Business School, Harvard University, Cambridge, MA 2001.

_ , "Founder-CEO succession and the paradox of entrepreneurial success," *Organ Sci*, 2003, *14* (2), 149–172.

_ , "Stewards, agents, and the founder discount: Executive compensation in new ventures," *Acad Manage J*, 2006, *49* (5), 960–976.

Werner, Steve, Henry L Tosi, and Luis Gomez-Mejia, "Organizational governance and employee pay: How ownership structure affects the firm's compensation strategy," *Strateg Manag J*, 2005, *26* (4), 377–384.

A. Appendix

A.1 Detail about the prevalence in family succession by industry

In Section 5.3, we analyze how the prevalence of family succession influences the relationship between personal guarantees and CEO succession. In the analysis, we use the TSR Business Successor Survey to construct an index for the prevalence of family succession in each JSIC industry.

Table A1 presents the share of surveyed firms that answered they had succession plans and, among those firms, the percentage of that had family succession plans by industry. We aggregate the JSIC industry codes into 16 larger classifications for ease of presentation. The top three industries in terms of the share of surveyed firms with succession plans are compound services (41.1%), fisheries (36.1%), and manufacturing (34.1%). The top three industries in terms of the share of surveyed firms with family succession plans are fisheries (85.5%), construction (82.3%), and agriculture, fisheries, and forestry (79.2%).

Table A1: Family succession and successor existence across industries

Industry	**Family succession (%)**	**Successor existence (%)**
Accommodations	73.874	22.145
Agriculture, fisheries, and forestry	79.271	31.276
Compound services	71.430	41.180
Construction	82.303	26.990
Education	57.255	18.400
Electricity, gas, heat supply, and water	38.191	23.124
Finance and insurance	25.435	27.996
Fisheries	87.555	36.190
Information and communications	26.164	13.659
Personal services and entertainment	73.006	21.823
Manufacturing	71.090	34.155
Medical and healthcare	60.920	16.081
Mining	73.250	33.600
Real estate	74.219	24.900
Scientific research	40.656	15.924
Services	61.739	22.993
Transport and postal services	64.281	27.806
Wholsale and retail	71.839	27.618

A.2 Robustness check with a different measure of Share_NoPG

In our main estimation, we use the independent variable, *Share_NoPG*, which measures the share of JFC outstanding loans without personal guarantees to analyze the relationship between SMEs' reliance on personal guarantees and subsequent CEO succession. In this section, we use a different measure of the SMEs' reliance on personal guarantees and conduct a robustness check.

One issue of using Share_NoPG defined by expression (2) is that firms that took out JFC loans without personal guarantees may have increased non-JFC loans with personal guarantees. To deal with this issue, we conduct a robustness check using an alternative estimation strategy whereby Share_NoPG is calculated as JFC outstanding loans without personal guarantees over the firms' total outstanding loans (including non-JFC financial institutions) expressed by the following:

$$\text{Share\_NoPG} = \frac{(\text{JFC loan without PG in 2016/3})}{(\text{Total loan in 2016/3})}. \tag{5}$$

With the above specification, we assume that non-JFC loans as of March 2016 were issued with personal guarantees. This is certainly an approximation, but given that non-JFC financial institutions had a very low rate of lending without personal guarantees before March 2016, as shown in Figure 1, we believe that it is a valid approximation

Table A2 presents the results of the main estimations using the alternative definition of Share_NoPG. The first column shows the results of the regression CEO change on Share_NoPG with other control variables. Consistent with the finding in Section 5.1, the coefficient on Share_NoPG is positive and significant, suggesting that a higher share of loans without personal guarantees is associated with a higher subsequent CEO succession

rate. Columns 2 and 3 confirm the findings in Sections 5.2 and 5.3. The interaction term between CEO ownership and Share_NoPG is negative and significant, which implies that the effect of reduced reliance on personal guarantees on CEO succession is smaller for firms with higher CEO ownership. Similarly, The interaction term between the industry-level family succession rates and Share_NoPG is negative and significant, suggesting that the effect of reduced reliance on personal guarantees on CEO succession is smaller for firms in industries where family succession is common.

A.3 CEO succession and personal guarantee practices by prefecture

Table A3 presents the number of firms, the average share of JFC loans without personal guarantees in March 2016, and the share of firms that experienced CEO succession between March 2016 and March 2020 by prefecture. The top five prefectures in terms of the number of firms (that took out JFC loans during our sample period) are Tokyo, Osaka, Aichi, Hyogo, and Fukuoka, which mostly correspond to the largest prefectures in Japan in terms of population and prefecture-level GDP. The top five prefectures in terms of the highest CEO succession rates are Akita (23.1%), Ishikawa (21.3%), Tokushima (20.5%), Gifu (19.1%), and Mie (18.9%). The prefectures with high CEO succession rates are the ones that have been experiencing rapid population aging and need to encourage CEO succession to younger generations. The top five prefectures in terms of a higher share of loans without personal guarantees are Fukushima (39.9%), Ishikawa (38.8%), Nagano (37.4%), Hyogo (37.3%), and Tokyo (35.7%). To control for prefecture-specific effects, we included prefecture fixed effects in our estimation (see §4.2 for more details).

Table A2: Robustness check using a different measure of Share_NoPG

	Dependent variable:		
	CEO Change (2016/4–2020/3)		
Independent variable	**(1)**	**(2)**	**(3)**
Share No PG (Total Debt)	0.00157	0.00216	0.0216
	(0.000836)	(0.000303)	(0.00584)
× CEO shareholding		-0.0116	
		(0.00370)	
× Share Family Succession			-0.0295
			(0.00878)
CEO Shareholding		-0.0872	
		(0.00903)	
Share Family Succession			-0.0310
			(0.0198)
ln(CEO Age)	0.480	0.483	0.480
	(0.0158)	(0.0160)	(0.0147)
Rating	-0.00641	-0.00509	-0.00624
	(0.00110)	(0.00110)	(0.000973)
Prefecture FE	Yes	Yes	Yes
JSIC 4-digit FE	Yes	Yes	No
Observations	20,270	20,270	20,385
R^2	0.124	0.130	0.082

Standard errors in parentheses.

Notes: This table presents the results of a robustness check in which we calculate Share_NoPG using expression (5). We exclude firms that took out the loans for business succession programs from our sample. Independent variables are dummies for CEO change during whole sample (2016/4–2020/3). Dependent variables were measured in March 2016. Share_NoPG is each firm's share of JFC loans without personal guarantees out of total debt (including non-JFC loans). Standard errors (in brackets) are robust to arbitrary heteroscedasticity and clustered across JSIC industries and prefectures. The level of analysis is at the firm level.

Table A3: CEO succession and firms' share of loans without personal guarantees by prefectures

			Share of firms with		
Prefecture	**# of firms**	**Avg. Share NoPG**	**(Share NoPG = 0)**	**(Share NoPG = 1)**	**CEO change**
Hokkaido	943	0.298	0.536	0.151	0.150
Aomori	239	0.287	0.523	0.121	0.156
Iwate	232	0.330	0.414	0.112	0.127
Miyagi	500	0.335	0.456	0.134	0.179
Akita	208	0.337	0.514	0.183	0.231
Yamagata	284	0.325	0.514	0.187	0.161
Fukushima	309	0.399	0.405	0.197	0.134
Ibaraki	292	0.230	0.616	0.092	0.155
Tochigi	285	0.251	0.600	0.119	0.141
Gunma	389	0.326	0.512	0.183	0.107
Saitama	749	0.334	0.470	0.143	0.158
Chiba	352	0.295	0.565	0.159	0.164
Tokyo	4417	0.357	0.486	0.166	0.142
Kanagawa	934	0.336	0.512	0.173	0.156
Niigata	613	0.328	0.501	0.153	0.167
Toyama	365	0.353	0.427	0.164	0.157
Ishikawa	328	0.388	0.430	0.216	0.213
Fukui	259	0.356	0.421	0.158	0.145
Yamanashi	186	0.328	0.478	0.145	0.124
Nagano	416	0.374	0.404	0.142	0.168
Gifu	235	0.300	0.519	0.153	0.191
Shizuoka	614	0.325	0.510	0.174	0.142
Aichi	1194	0.330	0.508	0.157	0.146
Mie	237	0.329	0.489	0.143	0.189
Shiga	147	0.309	0.544	0.184	0.114
Kyoto	315	0.315	0.511	0.152	0.112
Osaka	3367	0.329	0.501	0.153	0.134
Hyogo	1024	0.373	0.452	0.176	0.132
Nara	212	0.313	0.509	0.179	0.139
Wakayama	189	0.298	0.593	0.164	0.187
Tottori	154	0.309	0.500	0.143	0.143
Shimane	188	0.305	0.505	0.144	0.169
Okayama	425	0.331	0.489	0.172	0.164
Hiroshima	499	0.267	0.559	0.124	0.146
Yamaguchi	385	0.292	0.535	0.156	0.152
Tokushima	152	0.197	0.658	0.086	0.205
Kagawa	246	0.291	0.585	0.130	0.155
Ehime	274	0.253	0.613	0.128	0.161
Kochi	156	0.224	0.654	0.115	0.129
Fukuoka	972	0.290	0.544	0.158	0.162
Saga	188	0.308	0.484	0.149	0.091
Nagasaki	223	0.341	0.471	0.188	0.137
Kumamoto	296	0.207	0.662	0.105	0.112
Oita	233	0.244	0.571	0.116	0.169
Miyazaki	210	0.232	0.619	0.100	0.138
Kagoshima	242	0.212	0.649	0.079	0.133