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Risk Taking and Firm Growth

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Abstract

Using firm data from 2002-2012, we examine the relationship between capital structure and risk taking, and between risk taking and firm performance of small and medium-sized enterprises and large private firms. Domestically-owned entrepreneurial private firms are more risk avoidant than domestically-owned affiliated private firms. Foreign-owned affiliated private firms are much more risk taking than domestically-owned private firms. However, leverage is not strongly associated with less corporate risk taking, but it adversely influences corporate investment significantly. Risk taking has statistically and economically significant effects on corporate growth and corporate earnings. And during a credit crisis, risk taking is also positively related to corporate earnings and thus higher risk-taking firms have smaller cash flow shortfalls.

Keywords: Risk taking, Private firms, Ownership structure, Leverage, Corporate growth, Corporate earnings, Credit crisis

JEL classification: G30, G32, G34

[1] This study is conducted as a part of the Project "Study on Corporate Finance and Firm Dynamics" undertaken at Research Institute of Economy, Trade and Industry (RIETI). This study utilized firm level data of Kigyou Katsudou Kihon Chousa Houkokusho (the Basic Survey of Japanese Business Structure and Activities) conducted by Ministry of Economy, Trade and Industry and Chushou Kigyou Jittai Kihon Chousa (the Basic Survey on Small and Medium Enterprises) conducted by the Small and Medium Enterprise Agency, Ministry of Economy, Trade and Industry . Financial support from JSPS Grant-in-Aid for Scientific Research (25285085, 25301027) is gratefully acknowledged. The author would also like to thank Masahisa Fujita, Masayuki Morikawa, Keiichiro Oda, Hiroshi Ohashi, Iichiro Uesugi and other seminar participants at RIETI.

1. Introduction

Entrepreneurs are thought to be capable of innovation and risk-taking. Innovation and risk-taking are widely viewed as critical components to the success of any economy. Most of private companies are run by entrepreneurs. What drive risk-taking of private firms? Do the entrepreneurs of small and medium-sized enterprises take more risks in comparison with risk choices of affiliated small and medium-sized companies? Are domestically-owned small firms more risk avoidant than foreign-owned small firms reflecting difference in uncertainty avoidance across countries? Is risk-taking positively related to firm growth? Does risk-taking lead to better performance of private companies? However, we know little about the determinants of risk taking, and the relationship between risk-taking and firm growth of private companies.

Unlike publicly traded firms with dispersed ownership, conflicts of interest between insiders and outsider shareholders do not take place in entrepreneurial firms. Thus it is less likely for entrepreneurs to avoid some value-enhancing risky projects in the context of preserving private benefits as addressed in the seminal work of John et al. (2008). On the other hand, entrepreneurs are likely to invest more conservatively unless they hold a diversified portfolio of firms. Similarly, John et al. (2008) argue that the investment policies implemented in publicly-traded firms with larger insider ownership positions

are likely to be more conservative investment policies, because of their large exposure to these firms.

Some small and medium-sized enterprises are subsidiaries. Hereafter, firms owned by other companies are referred as affiliated firms. The intensive monitoring of the parent company dampens the magnitude and the importance of private benefits to the manager. Also, earnings are siphoned out and losses are absorbed to the parent company. The argument of divergence of control and cash flow rights in publicly-traded firms with pyramid ownership structure is no applicable to private affiliated firms. Furthermore, it is possible for the parent to delegate authority and accountability to affiliated firms (e.g. Ito, Hayashida and Kikutani (2008)) and this might encourage the managers have some autonomy to innovate unlike a unit within the parent.

Quite a number of affiliated firms are foreign-owed. From a cultural viewpoint, Hofstede describes corporate Japan (http://geert-hofstede.com/japan.html), “a lot of time and effort is put into feasibility studies and all the risk factors must be worked out before any project can start. Managers ask for all the detailed facts and figures before taking any decision. This high need for uncertainty avoidance is one of the reasons why changes are so difficult to realize in Japan”. The increased involvement of foreign investors is thus likely to change risk-taking behavior in corporate Japan. Consistently,

Nguyen (2012) finds that all performance volatility proxies increase significantly with the level of foreign ownership. Based on John et al. (2008), Kim (2011) shows that Korean firms with high foreign ownership are more risk taking and risk-taking in turn is positively associated with firm growth. Likewise, foreign investors (companies) acquire the power of control over the management of a private firm and then bring different firm-specific management skills and different corporate culture with respect to risk-taking into the targeted firm.

Meanwhile, powerful banks may influence investment policy because they prefer conservative corporate investment for their own benefit. Consistent with a bank-centered governance system, Weinstein and Yafeh (1998) find that banks discourage their clients from investing in risky, profitable projects and close bank-firm ties lead to slow growth rate. Also, Morck and Nakamura (1999) show that powerful banks in Japan discipline firms to advance creditors' interests even at the expense of firm value. In the late 1990s, to avoid the realization of losses on their own balance sheets, troubled Japanese banks continued to provide additional credits to severely impaired borrowing firms, as reported in Peek and Rosengren (2005). Corporate risk-taking in private firms relies more on the influence of banks.

The ambiguities regarding risk-taking of small and medium-sized enterprises motivate

our empirical investigation. Using firm data from 2002-2012, we examine the relationship between capital structure and risk-taking, and between risk-taking and firm performance of private enterprises. Domestically owned entrepreneurial private firms are more risk-avoidant than domestically owned affiliated peers. Foreign owned affiliated private firms are much more risk-taking than domestically owned counterparts. However, leverage is not associated with less corporate risk-taking but it adversely influences corporate investment significantly. Risk-taking has statistically and economically significant effects on corporate growth and performance. More importantly, risk-taking is also positively related to corporate growth and corporate performance during the credit crisis. This study sheds new light on relationship between risk-taking and growth. In particular, this study is one of the first to empirically link risk-taking to earnings. Also, our study complements extant studies on risk-taking of large publicly traded firms.

The organization of this paper is as follows. In section 2, we describe the data and methodology. The determinants of risk-taking and the relationship between risk-taking and firm growth and firm performance are examined in Section 3. Section 4 concludes.

2. Data and Methodology

We use the micro databases of Kigyou Katsudou Kihon Chousa (the Basic Survey of Japanese Business Structure and Activities) conducted by the Ministry of Economy, Trade and Industry (METI) and Chushou Kigyou Jittai Kihon Chousa (the Basic Survey on Small and Medium Enterprises) conducted by the Small and Medium Enterprise Agency, METI. The main purpose of the surveys is to acquire collective and quantitative information on diversification, globalization, internationalization and soft economy of Japanese enterprises. The surveys are comprised of all firms with more than 50 employees and with capital of more than 30 million yen and a sample of small and medium enterprises, covering both manufacturing and non-manufacturing industries.

First, we adjust EBITDA/Assets by two-digit SIC industry code. Then, we require consecutive 11 years of data on EBITDA/Assets and compute the deviation of adjusted EBITDA/Assets over 2003-2012 at firm level as follows. Using a large panel data of manufacturing companies included in the databases from 2002 to 2012, we examine the determinants of risk-taking of small and medium-sized enterprises and the relationship between risk-taking and firm growth.

$$\text{RISK}=\sqrt[2]{\frac{1}{T-1}\sum_{t=1}^{T}(E_{i,I,t}-\frac{1}{T}\sum_{t=1}^{T}E_{i,I,t})^2}$$

where

$$E_{i,I,t} = \frac{EBITDA_{i,I,t}}{Assets_{i,I,t}} - \frac{1}{N_{I,t}} \sum_{k=1}^{N_{I,t}} \frac{EBITDA_{k,I,t}}{Assets_{k,I,t}}$$

$N_{I,t}$ indexes the firms within industry I and year t. $EBITDA_{i,I,t}$ is defined as depreciation plus operating income after depreciation. $Assets_{i,I,t}$ is total assets. *T*: is the period 2003 to 2012. This proxy based on the volatility of corporate earnings has been used for the degree of risk-taking in operations since riskier corporate operations have more volatile returns to assets[2]. Also, Adams, Almeida and Ferreira (2010) find that variability in corporate performance increases with the degree of CEO power in decision making. Their evidence is consistent with Sah and Stiglitz (1986, 1991) and a large management and organizational literature. In contrast, seeking consensus in decision making suggests reluctant and slow changes in response to changing management environments and thus a lower degree of risk taking. In particular, a firm is less likely to exit from declining businesses quickly if it takes time to reach consensus. For example, Nakano and Nguyen (2012) find that performance variability falls significantly when Japanese firms with few investment opportunities operate with larger boards. In addition, firm-specific human capital and long-term employment in Japan implies that both managers and employees prefer conservative decisions.

[2] Quite a number of studies also relate the absolute deviation from the firm's expected performance as an alternative risk measure to firm characteristics. This procedure is known as Glejser heteroskedasticity test.

Asset (sales) growth is asset (sales) growth over the sample period 2003 to 2012. Performance is the sum of the ratio of EBITDA to total assets from 2003 to 2012. Initial leverage is defined as the ratio of the book debt to total assets. Alternatively, we use initial short-term leverage defined as the ratio of the short-term debt to total assets and long-term leverage defined as the ratio of the long-term debt to total assets to proxy bank dependence. We define firm size as the natural logarithm of total assets in 2002 (log (initial assets)). Firm age (log (initial firm age) is the logarithm of age in 2002. Foreign ownership is the ownership level of foreign investors or foreign companies in 2002. Parent ownership is the ownership level of the parent company in 2002. Corporate liquidity is the ratio of the liquid assets to total assets. The deviation of adjusted EBITDA, sales growth, asset growth, and performance is respectively winsorized at the 0.5% level on both sides of the distribution.

Manufacturing firms with capital less than 300 million yen or with regular employees less than 300 are defined as small and medium-sized enterprises. Their corporate operations may be influenced government policies such as the Small and Medium-sized Enterprise Basic Act. We retrieve two smaller datasets from this dataset: balanced panel datasets covering 2002-2012: 4383 small and medium-sized manufacturing firms with capital less than 300 million yen or with regular employees

less than 300, and, 898 private manufacturing firms with capital more than 300 million yen and with regular employees more than 300 (hereafter large private firms).

Based on the seminal work of John et al. (2008), we regress risk-taking on variables that capture ownership influence, bank influence, controlling for other factors X_i using following specification. If ownership structure influences corporate risk-taking, we would expect coefficients significantly different from zero in (1).

$$RISK_i = \alpha_1 + \alpha_2 Ownership\ Influence + \alpha_3 Bank\ Influence + \alpha_5 X_i + \nu_i \qquad (1)$$

Quite a number of studies have been attempted to explore the determinants of corporate risk-taking. Only John, et al. (2008) provide important evidence of relation between the instrumented risk-taking and both company asset and sales growth as well as the relation between ownership and risk-taking .To examine whether risk-taking is positively associated with growth and performance, based on John, et al. (2008) we relate firm-growth and performance to risk-taking, controlling for corporate liquidity and other factors. To address the endogeneity problem, we instrument risk-taking with firm size, foreign ownership and parent ownership. In John et al. (2008), firm size and

the investor protection variables are used as instrumental variables. Growth is asset (sales) growth and performance is EBITDA/Assets over 2003-2012. Y_i, Z_i are control variables. Our empirical hypothesis is that regressions of (2) and (3) generate a positive coefficient of risk-taking.

$$Gorwth_i = \beta_1 + \beta_2 RISK_i + \beta_3 Y_i + \omega_i \quad (2)$$

$$Performance_i = \gamma_1 + \gamma_2 RISK_i + \gamma_3 Z_i + \xi_i \quad (3)$$

3. Empirical results

Descriptive Statistics

Table 1 reports descriptive statistics for our sample. Reflecting the protracted slump in the Japanese economy, the mean sales growth rate of small and medium-sized firms is 14% and the median sales growth rate is 2.4% over the sample period 2003-2012. The mean sales growth rate of small and medium-sized firms is 29.6% and the median sales growth rate is 12.4% of large private firms. Asset growth rates are also very lower. The mean parent ownership is 20% and 10% or more of small and medium-sized firms are affiliated firms. Among large private firms, the mean foreign ownership is 4.4% and the

mean parent ownership is 48.8%. The data indicates variations of ownership among private firms.

Risk-taking

First, we run regressions of risk-taking on ownership structure and bank dependence, controlling for firm size, firm age and initial corporate earnings. The results in Table 2 indicate that risk-taking of wholly owned small businesses is about 0.9% (0.7%) higher than risk-taking in entrepreneurial small and medium-sized businesses (large private firms). This impact is substantial in comparison with the mean 3.7% (4.2%), the median risk-taking 3.1% (3.3%) and the standard deviation 2.5% (2.9%) of risk-taking in small and medium-sized businesses (large private firms).

The results indicate that affiliated firms are more risk-taking than entrepreneurial peers. It is controversial to compare risk-avoidance of entrepreneurs and managers of affiliated firms. Generally, entrepreneurship is construed as the creation of small and innovative businesses. Bankruptcy laws protect the assets of debtors from creditors and thus the entrepreneurship depends on the harshness of consequences of personal bankruptcy law. Likewise, entrepreneurs' risk-taking and innovation can be attributed to the harshness of the consequences of personal bankruptcy law. In Japan, bankruptcy exemption is very low (only 9,000 US dollars of cash in hand or 2,000 US dollars of

deposit). There is neither homestead exemptions that allow bankruptcy filers to protect some or all of the equity in their home in bankruptcy nor “wildcard” exemptions that can protect any property a debtor choose from creditors.

In Japan, usually entrepreneurs pledge their resident properties as collateral and their spouses and relatives provide unlimited liability guarantee as co-signer for entrepreneurial small businesses (Ono and Uesugi (2009)). In comparison, the manager and her (his) family are not necessarily required to provide collateral and guarantee for the business of a wholly owned subsidiary. Meanwhile, the findings of Ito, Kikutani and Hayashida (2008) suggest that managers of subsidiaries have discretion in implementing corporate policy. In sum, it is consistent with previous studies that entrepreneurs are more risk-avoidant than managers of wholly owned affiliated counterparts. Also, it is consistent with extant evidence that bankruptcy law has a statistically and economically significant effect on entrepreneurship and innovation in Acharya and Subramanian (2009), Armour and Cumming (2008), and, Primo and Green (2011).

Likewise, the results also indicate that the impact of foreign ownership is economically significant. As a matter of fact, risk-taking in wholly foreign owned small (large private) firms is 3.7% (1.8%) higher than domestically owned small (large

private) firms. In sum, a whole foreign ownership is associated with a 100% (42.5%) ascent above its mean. Extant studies examine that foreign owned firms outperform domestically owned firms in terms of profitability and productivity. I examine that foreign owned small and medium sized firms are substantially more risk-taking than domestically owned small and medium sized businesses. Nguyen (2012) finds that foreign ownership has strong impact on the volatility of stock returns, market-to-book value, and profitability of Japanese listed firms. Our results suggest that individuals with profitable but risky ideas are less likely to be part of a group decision of domestically owned small and medium sized businesses. Also, probably foreign owned firms are more likely to attract managers and employees with risky and profitable ideas because employees are rewarded more if they make outstanding contributions.

Long-term leverage is negatively related to risk-taking of small businesses with significance at the 5% level but leverage produces a small increase in risk-taking of large private firms. In Nguyen (2012), leverage has a strong positive effect on the volatility of ROA and stock return. In contrast, Adams et al. (2005) show a strong positive effect of leverage on the volatility of stock returns, a strong negative effect on the volatility of market-to-book but insignificant effect on the return volatility of ROA. But Cheng (2008) finds that the leverage has no effect on the return volatility of US

firms. Leverage has a negative sign but it is only marginally significant in John, et al. (2008). In summary, the effect of leverage on risk-taking is mixed and its magnitude is not very large.

Concerning the other covariates, initial corporate earnings appear to increase risk-taking. But John et al. (2008) find that profitable firms are more risk avoidant. Nguyen (2012) finds that ROA only reduces volatility of stock returns. Consistent with John et al. (2008) and Nguyen (2012), the effect of firm size on risk-taking of small and medium-sized firms is statistically significant and consistently negative. However, it is not significantly related to risk-taking in large private firms at the 10% level. Adams et al. (2005) find that the volatility of ROA is not significantly related to firm size. Consistent with Nguyen (2012), firm age reduces risk-taking.

Risk-taking and sales growth

To address the endogeneity of risk choices, we run instrumental variable regressions of sales growth on instrumented risk-taking, as reported in Table 3. We instrument RISK for small and medium-sized firms with firm size, parent ownership, foreign ownership and initial corporate earnings. Firm size is discarded from instrumental variables in regressions for large private firms, because it is not significantly related to risk-taking of

large private firms, as showed in Table 2. We recognize that this variable may directly influence growth, the degree of which we can judge by overidentification tests. Our sets of instruments appear valid as indicated by the overidentification tests. The regressions in Table 3 provide evidence of a statistically and economically significant and positive relation between the instrumented RISK and sales growth. A one standard deviation rise in risk-taking increases sales growth of small medium-sized businesses (large private firms) by 14.1% (23.2%). In other words, this is almost as large as the mean sales growth rate. In particular, the effect is significant at the 1% level in regressions for small and medium-sized businesses. These results are consistent with John et al. (2008) that sales growth of US listed manufacturing firms is positively related to risk-taking.

Short term leverage has a moderate negative effect on sales growth of large private firms with significance at the ten percent level. But no proxies for leverage have a significant effect on sales growth of small and medium-sized firms. Interestingly, a one standard deviation increase in corporate liquidity is associated with -2.8% (-5.3%) sales growth of small and medium-sized businesses (large private firms) with significance at the 1% (10%) level. Initial corporate earnings do not significantly influence subsequent sales growth. Firm size is not significantly related to sales growth when it is included as a regressor (results omitted here). Concerning firm age, young firms have higher sales

growth rates.

Risk-taking and asset growth

We also run instrumental variable regressions of asset growth on instrumented risk-taking. Table 4 reports the results. Firm size is included in as regressor in regressions (1) and (2) and it reduces asset growth significantly. In regressions (3), (5), (6),(7) and (8), RISK is instrumented with Log (initial firm age), parent ownership, foreign ownership. The over identification tests show our instruments appear valid. In comparison with the effect of risk-taking on sales growth, risk-taking does not contribute to asset growth of small and medium-sized firms. By contrast, a one standard deviation increase in risk-taking boosts asset growth of medium-sized business by 28.6% calculated using the coefficient generated by regression (8) in Table 4. It is economically huge in comparison with the mean asset growth rate of medium-sized firms. This result is consistent with John et al. (2008) that asset growth of US listed manufacturing firms is positively related to risk-taking.

Compared with its effect on sales growth, the effect of leverage on asset growth is statistically and economically significant. Asset growth of small and medium-sized businesses (large private firms) declines by 3.7% (7.9%) following a one standard

deviation increase in leverage. Bank dependence is more likely to adversely influence asset growth. Our results are consistent with Weinsten and Yahe (1998). In John et al. (2008), however, bank power is not significantly related to corporate growth.

Table 4 also shows that corporate liquidity boosts corporate asset growth. Asset growth of small and medium-sized businesses (large private firms) rises by 3.7% (6.5%) following a one standard deviation increase in corporate liquidity. Its significant negative effect on sales growth and significant positive effect on asset growth suggest that private firms with more liquid assets invest more or continue to retain more cash flow while their sales deteriorating. It might suggest that most private firms with decaying businesses hold more cash against future deteriorating cash flow as documented in Lins, Servaes and Tufano (2010).

Initial corporate earnings appear to increase corporate investment substantially. A 1% increase in initial EBITDA/Assets raises corporate asset growth by 1.8% (1.1%) of small and medium-sized (large private) businesses. As reported in Table 3, however, it is not relevant to subsequent sales growth. This suggests that most of profitable firms in Japan might be mature. But they invest while sales remaining flat. John et al. (2008) show that initial corporate earnings of US firms have both high sales growth and high asset growth. Only asset growth of small and medium-sized firms is significantly

negatively related to firm size and firm age

Risk-taking and corporate earnings

So far, there is no analysis of the linkage between risk-taking and corporate earnings. An important empirical question is whether risk-taking is positively related to profitability. We examine the effect of risk-taking on corporate earnings, while controlling for initial corporate earnings. Table 5 shows that a one standard deviation increase in risk-taking raises annual EBITDA/Assets of small medium-sized business (large private firms) by 4.8% (3.5%). It is notable that the average annual EBITDA/Assets of small and medium-sized firms over the sample period 2003-2012 is 6.9%. The relation between risk-taking and corporate earnings is substantial.

Our results are consistent with previous studies that focus on different features of foreign owned firms. Kimura and Kiyota (2004) find that foreign investors appear to invest in firms that may not be immediately profitable but achieve performance improvement and faster growth. Fukao, Ito, Kwon and Takizawa (2006) show that foreign acquisitions improved target firms' productivity and profitability significantly more and quicker than acquisitions by domestic firms. In contrast, there is no positive impact on target firms' profitability in the case of domestic acquisitions. These results

imply that foreign investors bring changes into the Japanese firms and take prompt actions against poor or moderate performance. And the prompt actions result in higher risk-taking and better performance of foreign owned firms. Also, Kang and Shivdasani (1997) pointed out that compared to US firms with a similar decline in performance, Japanese firms were less likely to downsize, and layoffs affected a smaller fraction of their workforce in the late 1980s. However, such reluctant downsizing in response to poor performance seems to change little.

Also, we find that profitability persists in the subsequent decade. A 1% increase in initial corporate earnings in 2002 increases average EBITDA/Assets over 2003-2012 by 0.26% (0.38%) in small and medium-sized (large private) business. A 10% increase in corporate liquidity reduces average EBITDA/Assets in the subsequent decade by 0.3%. Private firms with more liquidity not only grow slowly in terms of sales but also underperform subsequently. Perhaps decaying small and medium-sized firms hold more cash. Firm size and firm age are positively related to profitability of small and medium-sized firms but it is not the case for large private companies.

Risk-taking and performance during the credit crisis

We have examined positive relationship between risk-taking and firm growth over

the period 2003 to 2012. Higher cash flow volatility implies that a firm is more likely to have periods of cash flow shortfalls or to have a large shortfall during a downturn of economy. As shown in Figure 1, there is a sharp decline in corporate earnings in fiscal year 2008 (2009 survey) and fiscal year 2009 (2010 survey) when the credit crisis hit the world economies. Now, we examine whether risk-taking contributes to poor corporate earnings during the credit crisis. Though risk-taking is positively related both to sales growth and corporate earnings over the period 2003 to 2012, one may argue that risk-taking during both normal and crisis years is associated with the poor firm performance during the credit crisis. Indeed, Beltrattia and Stulz (2013) find that banks with significantly worse performance during the crisis than other banks were not less risky before the crisis. If poor performance during the crisis is relevant to our proxy for risk-taking, there should be an inverse relationship between our risk-taking proxy and poor performance during the crisis. In other words, firms with higher firm growth and corporate earnings during non-crisis periods were performing worse during the crisis.

Are firms that invest more conservatively prone to perform better during crises? We estimate cross-sectional regressions of EBITDA/ASSETS on risk-taking only for the crisis years, 2008 and 2009. The results of Panel B in Table 6 suggest a positive relationship between risk-taking and operating performance during the crisis, though

small and medium-sized firms were very vulnerable as shown in Panel A of Table 6. We find that firms with more risk-taking during both normal and crisis years have better operating performance during the crisis years, 2008 and 2009. Similarly, the effects are both statistically and economically important. These results are consistent with the positive association between risk-taking and corporate asset growth. Otherwise, higher risk-taking should be associated with lower average levels of investment because firms do not use external capital markets to fully cover cash flow shortfalls but rather forgo investment permanently as addressed in Minton and Schrand (1999).

4. Conclusion

In this paper I explore the relationship between ownership structure and corporate risk-taking, and between risk-taking and firm growth of private firms. Domestically owned entrepreneurial firms are more risk-avoidant than domestically owned affiliated private firms. Foreign owned affiliated private firms are much more risk-taking than domestically owned private firms. However, leverage is not associated with less corporate risk-taking but it adversely influences corporate investment significantly. Risk-taking has statistically and economically significant effects on corporate growth

and corporate earnings. Interestingly, private firms with more liquidity invest more or continue to retain more cash flow while their sales and earnings deteriorating. Also, risk-taking is also positively related to performance during the crisis.

This study sheds new light on relationship between risk-taking and growth of private firms. In particular, this study is one of the first to empirically link risk-taking to corporate earnings. Our results suggest that encouraging risk-taking in domestically owned entrepreneurial firms is helpful to achieve new economic growth after the protracted slump in the Japanese economy. Over the last two decade, Japan has sought to encourage entrepreneurship and innovation by reducing the harshness of the consequences of personal bankruptcy law. To induce greater entrepreneurship and innovation, policymakers must revise the bankruptcy code as debtor friendly as the US bankruptcy code. In particular, it is critical to provide homestead exemptions to promote business continuation or a fresh start upon failure. This in turn would provide stronger incentives to Japanese entrepreneurs to take more risk.

Also, our results suggest that foreign investors bring new corporate culture concerning value-enhancing corporate decisions into Japan. Quite a number of studies have shown that foreign investors bring useful firm-specific assets such as technology, managerial ability, and effective corporate governance into Japan in the 1990s. The

spillover of corporate culture to undertake riskier but value-enhancing investments activates restructurings of domestic firms and enhances competition. Attracting more inward FDI will stimulate spillovers of risk-taking corporate culture as well as technology. And this will be helpful to achieve new economic growth. Policymakers must improve Japan’s comparative attractiveness as a destination for FDI.

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Appendix Variable list

Dependent Variable

- •RISK: the stardard deviation of $EDITDA_t/Assets_t$ over 2003-2012
- •Assets growth 2003-2012: $Assets_{2012}/Assets_{2002}-1$
- •Sales growth 2003-2012 :$Sales_{2012}/Sales_{2002}-1$
- •Performance: sum of $EDITDA_t/Assets_t$ over 2003-2012
- •Performance during the Crisis: sum of $EDITDA_t/Assets_t$ over 2009-2010

Independent variable

- •Initial leverage: total debt/total assets in 2002
- •Log (initial assets): the natural logarithm of total assets in 2002
- •Log (initial firm age): the natural logarithm of firm age in 2002
- •Initial short term leverage: short term debt/total assets in 2002
- •Initial long term leverage: long term debt/assets in 2002
- •Foreign: ownership: the ownership level of foreign investors in 2002
- •Parent: ownership: the ownership level of parent company in 2002
- •Initial corporate liquidity: liquid assets/total assets in 2002

Instrumented variable

- •RISK: the stardard deviation of $EDITDA_t/Assets_t$ over 2003-2012

Table 1 Descriptive statistics

variables	Mean	Std dev	Pctile 10	Pctile 25	Median	Pctile 75	Pctile 90
Panel A: small and medium-sized enterprises (N=4,383 firm observations)							
RISK	0.0374	0.0250	0.0146	0.0212	0.0312	0.0458	0.0659
Sales growth	0.1423	0.5917	-0.4185	-0.2233	0.0248	0.3535	0.7530
Asset growth	0.2150	0.5853	-0.3181	-0.1414	0.0861	0.3987	0.8633
Performance	0.6930	0.4624	0.2068	0.3918	0.6171	0.9235	1.2808
Initial assets	4382.711	6472.763	1020	1606	2746	4901	8576
log (initial assets)	7.963	0.861	6.928	7.382	7.918	8.497	9.057
Initial firm age	41.196	14.307	22	32	42	51	57
log (initial firm age)	3.634	0.469	3.091	3.466	3.738	3.932	4.043
Foreign ownership	0.004	0.054	0	0	0	0	0
Parent ownership	0.200	0.376	0	0	0	0	1
Initial corporate earnings	0.065	0.064	0.007	0.030	0.057	0.091	0.137
Initial leverage	0.662	0.225	0.320	0.521	0.709	0.844	0.921
Initial short-term leverage	0.402	0.188	0.162	0.265	0.387	0.522	0.659
Initial long-term leverage	0.260	0.185	0.035	0.105	0.233	0.387	0.526
Initial corporate liquidity	0.467	0.157	0.272	0.357	0.458	0.567	0.674

Panel B: large private firms (N=898 observations)

variables	Mean	Std dev	Pctile 10	Pctile 25	Median	Pctile 75	Pctile 90
RISK	0.0416	0.0295	0.0148	0.0219	0.0335	0.0518	0.0813
Sales growth	0.2956	0.7301	-0.3998	-0.1671	0.1241	0.5415	1.1429
Asset growth	0.2103	0.6736	-0.4040	-0.1777	0.0667	0.3995	0.9193
Performance	0.914	0.547	0.337	0.526	0.830	1.204	1.671
Initial assets	22671.210	80738.740	3106	5176	9367	19710	41295
log (initial assets)	9.267	1.050	8.041	8.552	9.145	9.889	10.629
Initial firm age	37.892	17.442	13	27	39	52	58
log (initial firm age)	3.460	0.711	2.565	3.296	3.664	3.951	4.060
Foreign ownership	0.0436	0.1775	0	0	0	0	0
Parent ownership	0.4875	0.4487	0	0	0.578	1	1
Initial corporate earnings	0.0729	0.0671	0.0125	0.0345	0.0649	0.1035	0.1524
Initial leverage	0.6585	0.2151	0.3481	0.5156	0.6971	0.8309	0.9163
Initial short-term leverage	0.4653	0.1979	0.2053	0.3166	0.4670	0.6136	0.7337
Initial long-term leverage	0.1932	0.1532	0.0291	0.0777	0.1630	0.2708	0.3861
Initial corporate liquidity	0.4327	0.1608	0.2284	0.3234	0.4259	0.5368	0.6344

Table 1 presents descriptive statistics for variables in our sample. RISK is computed as the deviation of EBITDA/Assets adjusted with two-digit industrial mean from 2003 to 2012. EBITDA is depreciation plus operation income after depreciation. Asset (sales) growth is asset (sales) growth over the sample period, 2003-2012. Performance is the sum of the ratio of EBITDA to total assets from 2003 to 2012. Initial variables are defined as those variables in 2002. Initial leverage is defined as the ratio of the book debt to total assets. Alternatively, we use initial short-term leverage defined as the ratio of the short-term debt to total assets and long-term leverage defined as the ratio of the long-term debt to total assets to proxy bank dependence. Foreign ownership is the ownership level of foreign investors or foreign companies in 2002. Parent ownership is the ownership level of the parent company in 2002. Initial corporate liquidity is the ratio of the liquid assets to total assets. The deviation of adjusted EBITDA/Assets, sales growth, asset growth, and performance is respectively winsorized at the 0.5% level on both sides of the distribution.

Table 2 Risk-taking Regressions

	Small and medium-sized enterprises			Large private firms			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log (initial assets)	-0.005	-0.005	-0.005	-0.001	-0.001		
	(10.98)***	(10.87)***	(10.97)***	(1.03)	(1.02)		
Log (initial firm age)	-0.005	-0.005	-0.005	-0.004	-0.004	-0.004	-0.004
	(4.85)***	(4.92)***	(4.96)***	(2.85)***	(2.86)***	(3.03)***	(3.03)***
Initial corporate earnings	0.036	0.035	0.035	0.06	0.06	0.059	0.059
	(3.37)***	(3.35)***	(3.37)***	(2.65)***	(2.65)***	(2.57)**	(2.57)**
Initial short-term leverage	0.002			0.012		0.011	
	(0.90)			(2.27)**		(2.24)**	
Initial long-term leverage	-0.004		-0.004	0.014		0.014	
	(1.93)*		(2.15)**	(1.96)*		(1.92)*	
Initial leverage		-0.001			0.013		0.012
		(0.68)			(2.94)***		(2.87)***
Foreign ownership	0.026	0.026	0.026	0.017	0.017	0.017	0.017
	(2.51)**	(2.49)**	(2.49)**	(2.71)***	(2.73)***	(2.67)***	(2.69)***
Parent ownership	0.009	0.01	0.01	0.007	0.007	0.007	0.007
	(7.34)***	(8.26)***	(7.65)***	(2.88)***	(2.94)***	(2.95)***	(3.01)***
Number of Observations	4,383	4,383	4,383	898	898	898	898
R^2	0.16	0.16	0.16	0.19	0.19	0.19	0.19

In this table we present OLS regressions of RISK on bank dependence and ownership structure, controlling for other factors such as firm size and firm age. RISK is computed as the deviation of EBITDA/Assets adjusted with two-digit industrial mean from 2003 to 2012. EBITDA is depreciation plus operation income after depreciation. Initial variables are defined as those variables in 2002. Initial leverage is defined as the ratio of the book debt to total assets. Alternatively, we use initial short-term leverage defined as the ratio of the short-term debt to total assets and long-term leverage defined as the ratio of the long-term debt to total assets to proxy bank dependence. Foreign ownership is the ownership level of foreign investors or foreign companies in 2002. Parent ownership is the ownership level of the parent company in 2002. Initial corporate liquidity is the ratio of the liquid assets to total assets. The deviation of adjusted EBITDA/Assets is winsorized at the 0.5% level on both sides of the distribution.Z statisticaks (in parentheses below the coefficients) are based on robust standard errors. ***, **, * indicate significance at 1%, 5% and 10%.

Table 3 Firm Sales Growth Instrumental Variable Regressions

	Small and medium-sized enterprises				Large private firms		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
RISK	5.837	5.626	5.656	5.825	12.19	7.88	7.99
	(3.44)***	(3.33)***	(3.35)***	(3.60)***	(1.95)*	(1.76)*	(1.76)*
Log (initial firm age)	-0.105	-0.105	-0.106	-0.105	-0.084	-0.106	-0.106
	(3.28)***	(3.31)***	(3.34)***	(3.28)***	(1.53)	(2.09)**	(2.08)**
Intial corporate liquidity	-0.175	-0.189	-0.191	-0.192	-0.327	-0.349	-0.362
	(2.66)***	(3.08)***	(3.15)***	(3.17)***	(1.58)	(1.75)*	(1.90)*
Initial corporate earnings	0.042	0.049	0.043		-0.569		
	(0.20)	(0.23)	(0.21)		(0.91)		
Initial short-term leverage	-0.012				-0.321	-0.249	-0.258
	(0.23)				(2.06)**	(1.93)*	(1.86)*
Initial long-term leverage	0.031				-0.018	0.043	
	(0.60)				(0.08)	(0.20)	
Initial leverage		0.008					
		(0.19)					
Number of Observations	4,383	4,383	4,383	4,383	898	898	898
Chi2	437.19	431.75	429.94	429.06	1,101.54	1,198.97	1,182.22
Hansen J-test	0.11	0.53	0.53	0.55	0.79	1.65	1.65
Hansen J-test p value	0.947	0.912	0.913	0.969	0.375	0.437	0.647

This table reports instrumental variable regressions of sales growth on instrumented RISK and control variables. Sales growth is sales growth over the sample period, 2003-2012. RISK is computed as the deviation of EBITDA/Assets adjusted with two-digit industrial mean from 2003 to 2012. EBITDA is depreciation plus operation income after depreciation. Initial variables are defined as those variables in 2002. Initial leverage is defined as the ratio of the book debt to total assets. Alternatively, we use initial short-term leverage defined as the ratio of the short-term debt to total assets and long-term leverage defined as the ratio of the long-term debt to total assets to proxy bank dependence. Foreign ownership is the ownership level of foreign investors or foreign companies in 2002. Parent ownership is the ownership level of the parent company in 2002. Initial corporate liquidity is the ratio of the liquid assets to total assets. RISK, sales growth is respectively winsorized at the 0.5% level on both sides of the distribution.Z statisticaks (in parentheses below the coefficients) are based on robust standard errors. ***, **, * indicate significance at 1%, 5% and 10%.

Table 4 Firm Asset Growth Instrumental Variable Regressions

	Small and medium-sized enterprises		Large private firms					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
RISK	-2.023	-0.35	10.278	13.724	12.427	10.888	11.851	9.694
	(0.63)	(0.12)	(2.04)**	(1.98)**	(2.71)***	(2.41)**	(2.68)***	(2.01)**
Log (initial assets)	-0.11	-0.099	-0.043					-0.044
	(5.38)***	(5.42)***	(1.59)					(1.62)
Log (initial firm age)	-0.172	-0.163		0.016				
	(5.22)***	(5.18)***		(0.30)				
Intial corporate liquidity	0.237	0.266	0.467	0.513	0.506	0.572	0.444	0.407
	(3.54)***	(4.20)***	(2.19)**	(2.37)**	(2.41)**	(2.97)***	(2.39)**	(2.19)**
Initial corporate earnings	1.865	1.796	1.324	1.037	1.117	1.314	1.133	1.342
	(8.09)***	(8.12)***	(2.29)**	(1.56)	(1.94)*	(2.36)**	(1.98)**	(2.34)**
Initial short-term leverage	-0.136		-0.436	-0.485	-0.471	-0.398		
	(2.60)***		(3.12)***	(3.16)***	(3.41)***	(2.80)***		
Initial long-term leverage	-0.245		-0.242	-0.279	-0.268			
	(4.77)***		(1.38)	(1.44)	(1.47)			
Initial leverage		-0.185					-0.399	-0.366
		(5.22)***					(3.62)***	(3.33)***
Number of Observations	4,383	4,383	898	898	898	898	898	898
Chi2	585.17	581.75	1,843.37	1,637.73	1,715.33	1,788.75	1,755.38	1,884.05
Hansen J-test	0.51	3.13	0.42	2.4	2.78	4.56	4.44	1.24
Hansen J-test p value	0.474	0.209	0.813	0.302	0.426	0.336	0.35	0.744

This table reports instrumental variable regressions of asset growth on instrumented RISK and control variables. Asset growth is asset growth over the sample period, 2003-2012. RISK is computed as the deviation of EBITDA/Assets adjusted with two-digit industrial mean from 2003 to 2012. EBITDA is depreciation plus operation income after depreciation. Initial variables are defined as those variables in 2002. Initial leverage is defined as the ratio of the book debt to total assets. Alternatively, we use initial short-term leverage defined as the ratio of the short-term debt to total assets and long-term leverage defined as the ratio of the long-term debt to total assets to proxy bank dependence. Foreign ownership is the ownership level of foreign investors or foreign companies in 2002. Parent ownership is the ownership level of the parent company in 2002. Initial corporate liquidity is the ratio of the liquid assets to total assets. RISK, asset growth is respectively winsorized at the 0.5% level on both sides of the distribution.Z statisticaks (in parentheses below the coefficients) are based on robust standard errors. ***, **, * indicate significance at 1%, 5% and 10%.

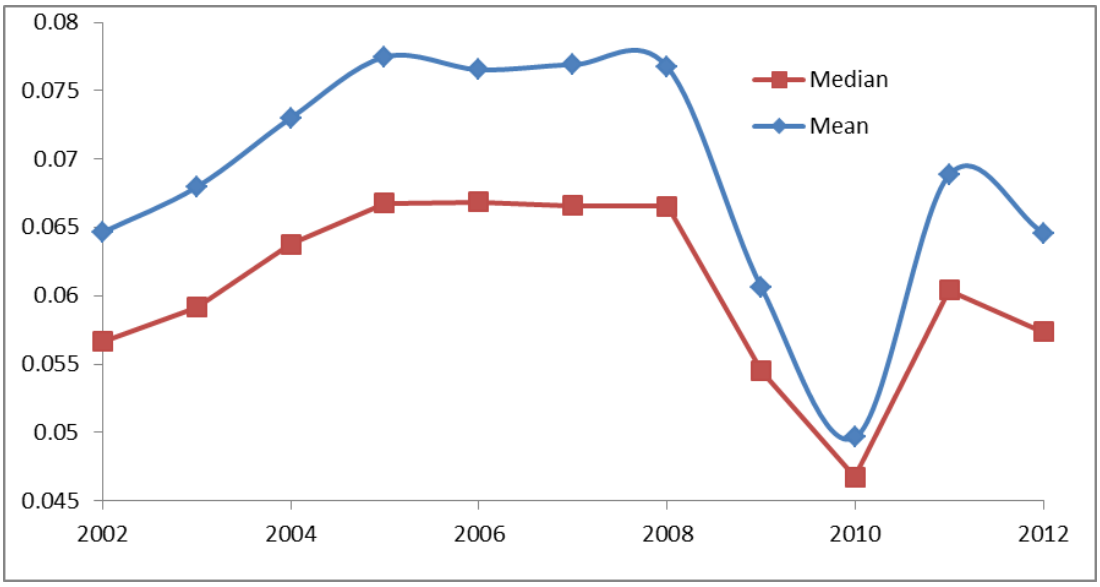
Table 5 Firm Performance Instrumental Variable Regressions

	Small and medium-sized enterprises			Large private firms			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
RISK	21.766	22.276	19.189	11.862	11.816	12.092	14.686
	(7.30)***	(7.60)***	(7.91)***	(4.75)***	(4.76)***	(5.38)***	(3.90)***
Log (initial assets)	0.121	0.124	0.104				0.001
	(6.17)***	(6.42)***	(6.38)***				(0.09)
Log (initial firm age)	0.051	0.051	0.038				0.034
	(1.65)*	(1.61)	(1.39)				(1.08)
Intial corporate liquidity	-0.301	-0.294	-0.347	-0.335	-0.34	-0.337	-0.321
	(4.45)***	(4.31)***	(5.96)***	(3.28)***	(3.51)***	(3.46)***	(2.91)***
Initial corporate earnings	2.649	2.608	2.756	3.978	3.979	3.96	3.813
	(9.12)***	(9.36)***	(9.61)***	(10.67)***	(10.68)***	(11.15)***	(8.72)***
Initial short-term leverage	0.055			-0.006			
	(1.05)			(0.07)			
Initial long-term leverage	0.222	0.213		0.01			
	(4.03)***	(3.80)***		(0.09)			
Initial leverage			0.131		-0.001		
			(3.58)***		(0.01)		
Number of Observations	4,383	4,383	4,383	898	898	898	898
Chi2	602.58	591.35	665.69	2761.39	2769.7	2726.42	2343.07
Hansen J-test	0.01	0.05	6.17	3.02	3.07	2.83	1.29
Hansen J-test p value	0.911	0.83	0.046	0.389	0.547	0.587	0.525

This table reports instrumental variable regressions of performance on instrumented RISK and control variables. Performance is defined as the sum of EBITDA/Assets over the sample period, 2003-2012. RISK is computed as the deviation of EBITDA/Assets adjusted with two-digit industrial mean from 2003 to 2012. EBITDA is depreciation plus operation income after depreciation. Initial variables are defined as those variables in 2002. Initial leverage is defined as the ratio of the book debt to total assets. Alternatively, we use initial short-term leverage defined as the ratio of the short-term debt to total assets and long-term leverage defined as the ratio of the long-term debt to total assets to proxy bank dependence. Foreign ownership is the ownership level of foreign investors or foreign companies in 2002. Parent ownership is the ownership level of the parent company in 2002. Initial corporate liquidity is the ratio of the liquid assets to total assets. RISK, performance is respectively winsorized at the 0.5% level on both sides of the distribution.Z statisticaks (in parentheses below the coefficients) are based on robust standard errors. ***, **, * indicate significance at 1%, 5% and 10%.

Figure 1 Firm Performance (EBITDA/Assets) around the Financial Crisis

Panel A Small and medium-sized firms



Panel B Large private firms

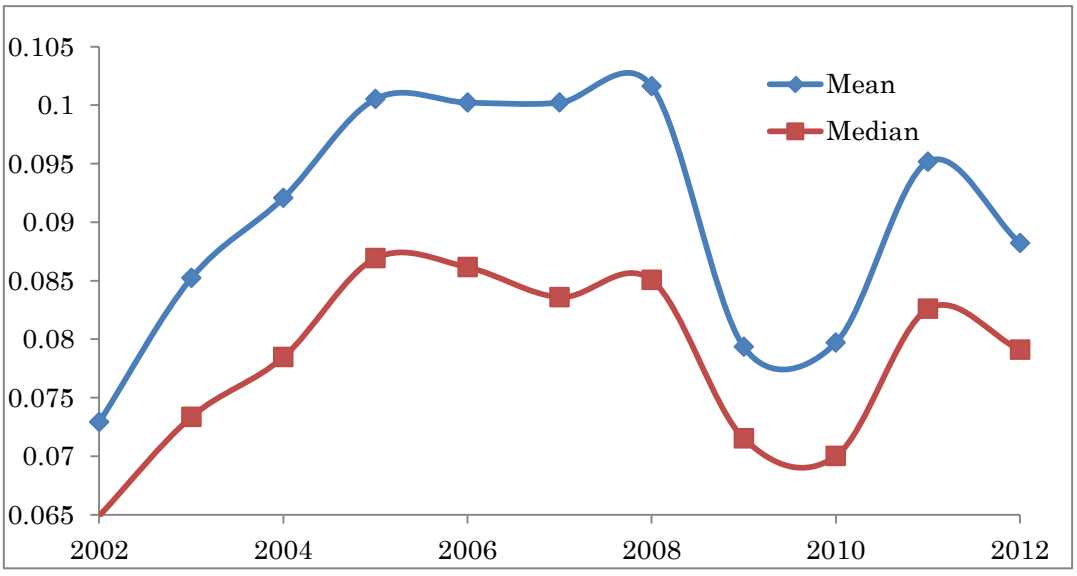


Table 6 Risk-taking and Firm Performance during the Crisis

Panel A Descriptive statistics for Perfromance during the Crisis

	Mean	Std dev	Pctile 10	Pctile 25	Median	Pctile 75	Pctile 90
Small and Medium-sized Enterprises	0.111	0.113	-0.011	0.046	0.100	0.167	0.251
Large private firms	0.155	0.135	0.012	0.071	0.140	0.227	0.328

Panel B Instrumental Variable Regressions

	Small and Medium-sized Enterprises		Large private firms	
	(1)	(2)	(3)	(4)
RISK	3.169	2.626	2.915	2.724
	(4.86)***	(5.60)***	(2.58)***	(4.03)***
Log (initial assets)	0.024	0.022	0.005	
	(5.65)***	(5.97)***	(1.22)	
Log (initial firm age)	0.009		0.002	
	(1.23)		(0.25)	
Intial corporate liquidity	-0.041	-0.041	-0.1	-0.094
	(2.83)***	(2.96)***	(3.05)***	(3.10)***
Initial corporate earnings	0.447	0.463	0.638	0.658
	(7.93)***	(8.47)***	(4.90)***	(6.11)***
Initial short-term leverage	0.048	0.049	0.012	
	(4.21)***	(4.49)***	(0.47)	
Initial long-term leverage	0.05	0.046	-0.022	
	(4.27)***	(4.24)***	(0.65)	
Number of Observations	4,383	4,383	898	898
Chi2	441.79	470.3	3,743.51	3,696.43
Hansen J-test	0.7	2.66	1.45	2.57
Hansen J-test p value	0.402	0.264	0.228	0.462

This table reports instrumental variable regressions of performance on instrumented RISK and control variables. Performance is defined as the sum of EBITDA/Assets over the crisis years, 2009-2010. RISK is computed as the deviation of EBITDA/Assets adjusted with two-digit industrial mean from 2003 to 2012. EBITDA is depreciation plus operation income after depreciation. Initial variables are defined as those variables in 2002. Initial leverage is defined as the ratio of the book debt to total assets. Alternatively, we use initial short-term leverage defined as the ratio of the short-term debt to total assets and long-term leverage defined as the ratio of the long-term debt to total assets to proxy bank dependence. Foreign ownership is the ownership level of foreign investors or foreign companies in 2002. Parent ownership is the ownership level of the parent company in 2002. Initial corporate liquidity is the ratio of the liquid assets to total assets. RISK, performance is respectively winsorized at the 0.5% level on both sides of the distribution.Z statisticaks (in parentheses below the coefficients) are based on robust standard errors. ***, **, * indicate significance at 1%, 5% and 10%.