Is Productivity Growth Correlated with Improvements in Management Quality? An Empirical Study Using Interview Surveys in Korea and Japan

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Is Productivity Growth Correlated with Improvements in Management Quality? -An Empirical Study Using Interview Surveys in Korea and Japan-[1]

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Abstract

Bloom and Van Reenen (2007) show that differences in management practices are correlated with productivity differences at the firm level. In this paper, we conducted similar interview surveys on management practices in Japanese and Korean firms in 2008 and 2012. We find that overall management scores in Japan -- as an average of organizational and human resource management scores -- are higher than those in Korea. However, the second survey shows that the gap in management scores between the two countries has shrunken over time. In addition, average management quality in Korean large firms has surpassed that of Japanese large firms. This result is consistent with the literature comparing big businesses in Korea and Japan. This study also compares additional aspects of management styles, such as speed in decision-making and the role of various communication channels, which is not done in the literature. When we estimate a production function including management score using all samples, we find a positive and significant relationship between management scores and productivity. Most estimation results show that organizational management scores are correlated with firm performances in Japanese firms, while human resource management scores are correlated with performance in Korean firms. We also find that management practices are correlated with improvements in capital and labor efficiencies. In the case of Japan, better organizational management practices in the past improve current firm performance. Our results show that the Japanese government and firms should promote management reforms to restore international competitiveness.

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1. Introduction

In 1997, Japan and Korea suffered similar financial crises and successive deep recessions. However, the recovery processes in the two countries are in stark contrast with each other. Although the Japanese economy has stagnated for a long time due to large non-performing loans, the Korean economy recovered rapidly. As a result, firm performance in Korea overcame that in Japan in some competing industries such as electric machineries and electric devices as shown in Fukao et al. (2008). In growth accounting using the framework of McGrattan and Prescott (2005, 2010), Miyagawa and Takizawa (2011) showed that the labor productivity gap between Japan and Korea after the financial crises could be explained by the differing accumulation in intangible assets as well as TFP growth.

Many studies at the firm level found that the Korean firms are rapidly catching up with Japanese firms in terms of productivity and market shares in several sectors. Jung, Lee, and Fukao (2008) noted that while productivity at Korean firms was as low as half of the Japanese in the mid 1980s, there had been substantial catch-up and productivity of Korean firms were on average within 10 percent of Japanese firms in the late 1990s. Jung and Lee (2010) find factors at both sectoral and firm levels leading to the converging productivity rates: while explicit-knowledge-oriented sectors, like IT, tend to show faster catch-up, firm-level factors, such as innovation capability and export-orientation, were also significant. Joo and Lee (2010) compare Samsung and Sony in various measures created from patent data, including citations. They conclude that while Samsung caught up with Sony in the mid-2000s in terms of market capitalization and sales volume, technological catch-up, in terms of patent count, quality and mutual citations, etc., occurred as early as the mid-1990s. While there would be many diverse reasons that Korea caught up with Japan, existing studies tend to consider mostly tangible aspects of the firms -- often reflected in standard financial statements or patent application data. As Aoki (2010) emphasized, intangible factors such as the organizational architecture within a firm are major drivers of corporation system in each country. The aim of our study is to apply the previous studies to the firm level, looking into more intangible aspects including management practices of the firms in the two countries.

The role of these intangible assets on economic performance was found through empirical studies in the first half of the 2000s. When the IT revolution started in the middle of the 1990s, many economists and policymakers believed that the rapid growth in the IT industry and increased IT investment contributed to the acceleration of US economic growth. As a result, many governments in advanced countries supported the IT industry and encouraged IT investment. However, the gaps in economic or productivity growth rates between the US and other advanced countries have remained intact, even in the early 2000s. Since then, many economists have begun to pay attention to the complementary

role of intangible assets in productivity growth. That is, they started to understand that IT assets without intangible assets, do not contribute to productivity growth at the firm and aggregated level.[2]

Corrado, Hulten and Sichel (hereafter referred to as CHS, 2005, 2009), estimated the investment in intangible assets at the aggregate US economy level, classifying intangible assets into three categories: computerized information, innovative property, and economic competencies. Many researchers in other advanced countries followed CHS (2009), and tried to estimate intangible investment.[3] Comparing the estimation results in Japan with those in the US and the UK, Fukao et al. (2009) and Pyo, Chun and Rhee (2011) found the following characteristics of intangible investment in Japan and Korea. First, investment in computerized information in Japan and Korea, measured as a share of GDP, is almost the same as that in the US and the UK. Second, due to the large R&D investment levels in Japan, the ratio of investment in innovative property to GDP is greater than in the US and the UK. Third, as for investment in economic competencies, the investment/GDP ratio in Japan and Korea is much smaller than that in the US and the UK.

The third category includes investment in brand equity, firm-specific human capital, and organizational reform. Among these, the investment in firm-specific human capital and organizational reform in Japan is much smaller than that in the US and the UK. However, it is difficult to estimate these investment amounts at the aggregate level and to compare these amongst advanced countries.[4] In addition, these investments depend on management practices at the firm level. Therefore, recent studies on intangible investment have focused on management practices on human resource management and organizational reform at the firm level using micro-data.

Bloom and Van Reenen (2007) examined the effects of management practices on firm performance based on interview surveys of plant managers. Management practices were converted to scores based on interview results, and these scores were included as independent variables when they estimated the production function. The key finding in their paper was that there is a large difference in management scores among surveyed countries (France, Germany, the UK, and the US). US firms attained the highest score of the four countries studied. They believed that the low score in continental European firms was partially explained by weak competition and the prevalence of many family-owned firms. The estimation results showed that the differences in productivity were correlated with the differences in average management scores. We conduct an interview survey similar to Bloom and Van Reenen's in Japan and Korea and use it

[2] Economic Report of the President 2007 stated 'Only when they (businesses) made intangible investments to complement their IT investments did productivity growth really take off.' (p. 56)

[3] See Corrado, Haskel, Jona-Lasinio, and Iommi (2013) for the US, EU countries and Japan, Chun, Fukao, Hisa and Miyagawa (2012) for Korea and Japan.

[4] For example, CHS (2009) does not account for the investment in firm-specific human capital through on-the–job training while this type of investment is very important in Japanese and Korean firms.

to explain the performance gap between Japanese and Korean firms. In Japan, Kurokawa and Minetaki (2006), Kanamori and Motohashi (2006), and Shinozaki (2007) examined the effects of organizational reform resulting from IT investment on firm performance by using the *Basic Survey on Business Enterprise Activities* and *IT Workplace Survey*. Their studies suggested that organizational reform from IT investment was partially responsible for improving firm performance. Our work develops on previous studies in Japan by comparing the performance in Japanese firms with that in Korean firms.

In the next section, we describe our interview survey. Although it pretty much follows Bloom and Van Reenen (2007), we incorporate some questions that were not included there to capture some unique features of Japanese and Korean firms, such as the role of informal meetings within the firm and on-the-job training. In the third section, we construct management scores by quantifying the interview results of Japanese and Korean firms, and compare the management practices of firms. In the fourth section, using the management scores and financial statements of Japanese and Korean firms, we estimate a production function and examine the effects of management practices on firm performance. In the last section, we summarize our studies.

2. Outline of Interview Surveys in Japan and Korea

The interview surveys on management practices on organization and human resource in Japan and Korea were conducted twice: First in 2008 and the second time in 2011-2012.[5] The description of each survey is summarized in Table 2. The two Japanese surveys were conducted by the Research Institute of Economy, Trade & Industry (RIETI). The first Korean survey was conducted by the Japan Center for Economic Research (JCER), and the second Korean survey was conducted by the Samsung Economic Research Institute. The second Japanese survey was originally scheduled to be conducted in 2011, but was postponed to 2012 due to the Great East-Japan Earthquake of March 2011. The number of responses in the second survey was drastically lower than the first, partly because of the earthquake and also because we limited the interviewees to publicly traded firms.

（Place Table 1 here）

In our study, though we followed the interview survey conducted by Bloom and Van Reenen (2007) we conducted the survey by meeting the managers of the planning departments of firms face-to-face, rather than by telephone as Bloom

[5] The interview survey in Japan is called as ‘Intangible Assets Interview Survey in Japan” in RIETI website.

and Reenen did. The reason we conducted our interviews in this way is that we were anticipating low response rates. In Japan and Korea, when we want to ascertain qualitative features in firms, face-to-face communication is a more effective tool than telephone interviews.

Bloom and Van Reenen (2007) classified their eighteen interview questions into four categories: product management, monitoring, the firm's target on business, and incentives for workers. While their survey focused on only manufacturing plants, our survey covered firms in the service sector as well. Thus, we excluded questions about product management for the service sector. As a result, we can classify our questions into two categories: organizational management and human resource management. In the first category, we wanted to examine the organizational goals, communication within the firm, and organizational reform. The second category about human resource management covers questions on promotion and training programs.

The interview also includes questions that are not directly related to management practices or human resource management. Since the IT revolution, changing the pyramid-type decision-making process into a more flat process became more common. We ask questions to understand whether firms underwent organizational restructuring that included changes in the decision-making process. In the first round, we also asked about the vision of the firm. In the second round of interviews, considering the globalization that was taking place, we included questions regarding firms' primary market and competitiveness (number of competitors), and the time it takes to enter and exit businesses. The detailed interview questions are shown in Appendices1 and 2.

For each question, we have three sub questions. The structure of the point system is that the more sub-questions answered in the affirmative in each large question, the more points you score for instance, in human resource management. In each question with 3 sub-questions, a score of 4 points would be applied if all of the 3 sub-questions were answered affirmatively. Similarly, with affirmative answers to the first 2 sub-questions only, you would score 2 points. In other words, we quantify the responses to the above questions as follows: If the firm manager responds in the negative to the first sub-question, we would give the response 1 out of a possible total of 4 points for the entire question, and move to the next question. If the manager responds affirmatively to the first sub-question, we move to the second sub-question. If the manager responds negatively to the second sub-question, we mark a 2 and move to the next question. If he responds affirmatively to the second sub-question, we move to the last and third sub-question. In the last sub-question, if the manager responds with an affirmative answer, he is given 4 points for affirmative response for all three sub-questions while a negative response is given 3 points for the two previous sub-questions he answered in the affirmative.

3. Comparison of Interview Survey Results in Korea and Japan

3-1. Distribution of sample firms by sector and by size

We first show the distribution of the firms interviewed. Table 2 shows the share of firms in the manufacturing sector and the service sector for both surveys. In the first survey, we interviewed machinery industries in the manufacturing sector, and in the service sector, we interviewed information service, media-related and the retail industry. In the second survey, since the sample was limited to publicly traded firms, we did not limit the interview to specific industries. As the first Japanese survey focused on specific industries in the manufacturing sector, the share of firms in the manufacturing sector was relatively small, and the share of firms in the manufacturing to service sector was about 33%. In the second survey, the ratio is reversed. In both the Korean surveys, on the other hand, the manufacturing sector constitutes approximately 80% of the interviewees.

（Place Table 2 here）

Table 3 shows the distribution of firms by size. In the Japanese surveys, small and medium sized firms with fewer than 300 employees constituted about half of the sample. On the other hand, in the first Korean survey, the share of small and medium-sized firms dominated the survey and accounted for 73% of the sample. In the second Korean survey, however, this share fell to 54%.

（Place Table 3 here）

3-2. Comparison of management scores

We now compare management scores. In the first survey, we take the average of these scores in Q2-1, Q2-2, Q2-3, Q4-1, Q4-3, Q4-4, Q5, and Q7-13 to obtain an overall management score. In the second survey, we take the average of the scores assigned to Q3-1, Q3-2, Q3-3, Q4, Q5, Q6-1, Q10-2, Q10-3, and Q10-4. The organizational management scores are the average scores in Q2-1, Q2-2, Q2-3, Q4-1, Q4-3, and Q4-4 in the first survey and the average score in Q3-1, Q3-2, Q3-3, Q10-2, Q10-3, and Q10-4 in the second survey. Also, the human resource management score is the average score in the questions that are not related to organizational management. A high management score implies that management targets within a firm are set and widely recognized by the employees. On the other hand, the human

resource management score is high when high performing employees receive rewards and promotion swiftly, and when firms invest in human capital accumulation.

Table 4 shows the management scores in Japan and Korea. In both surveys, management scores in Japanese firms are higher than those in Korean firms except for the case of management scores for large firms in the second survey. However, the Japanese management score falls slightly between the first and second survey while the Korean management score increases greatly between the first and second survey, catching up with Japan. In particular, the management score in Korean large firms surpasses that in Japanese large firms in Japan.

(Place Table 4 here)

Figures 1-1 to 1-4 show the distribution of scores in all firms and all interview questions in Japan and Korea by using the Kernel density. We find that the distributions of management scores in Korean firms are more dispersed than in Japanese firms. This implies that there are many high scoring firms and low scoring firms in Korea while management scores in Japanese firms are more concentrated around their mean values. When we compare the distributions in the two surveys in both countries, the distributions in the second survey in Japan is shifted slightly to the left. On the other hand, the distributions in the second survey in Korea shift drastically to the right

(Place Figure 1-1 to Figure 1-4 here)

We check similar distributions by type of management and by firm size (see Figures 2-1 to 2-8). The distributions of organizational management scores and human resource management scores show similar patterns to Figures 1-3 and Figure 1-4. When we compare the two surveys, the distributions of the two types of management scores in the second survey in Japan are pretty much the same. However, the two distributions of the management scores in the second survey in Korea shift greatly to the right. In the case of small and medium-sized firms, we also see similar patterns for other cases.

(Place Figure 2-1 to Figure 2-8 here)

The distributions of management scores by firm size show similar patterns to those by type of management. In

large firms, the distribution of management score in the second survey in Korea showed a great shift to the right, while that in Japan shifted slightly to the left. These shifts suggest that the means of the management scores in Korean large firms is greater than that in Japanese large firms. In addition, these results support the notion that the performances in the listed Korean firms surpassed those in the Japanese listed firms, as shown by Jung, Lee, and Fukao (2008) and Joo and Lee (2010). Similarly, the distribution of management scores of the Korean SMEs shifts to the right, although the distribution of management scores in the Japanese SMEs in the second survey does not move much.

We compare the two distributions of the first and second surveys of Japan and Korea by using the Kolmogorov=Smirnov test. Let us examine the two cumulative distribution functions (*F(x)* and *G(x)*) and take the maximum differences between two distributions (D_{mn}) defined from the sample distribution functions of *F(x)* and *G(x)*.

$$D_{mn} = \sup_{-\infty<x<\infty} \left| F_m(x) - G_n(x) \right|$$

In the Kolmogorov=Smirnov test, the null hypothesis is that the two distributions are the same (*F(x)=G(x)*). If the test statistics $\left(\frac{mn}{m+n}\right)^{1/2} D_{mn} > c$ and *c* is an appropriate constant, the null hypothesis is rejected.

The test results are shown in Table 5. The Kolmogorov=Smirnov test is conducted in four cases: the comparison of the two distributions in Japan and Korea in the first survey, the comparison of the two distributions in Japan and Korea in the second survey, the comparison of the two distributions in the first and second surveys in Japan, and the comparison of the two distributions in the first and second surveys in Korea. In the first two rows of the first two tables, we test the hypothesis of whether the sample values in Japan are significantly smaller than those in Korea. The last row shows the combined results of the previous two tests. 'Distance' in the second column shows the maximum distance in the case where the sample value in Japan is less than that in Korea. P values in the first and second surveys show that sample values in Japan are not significantly smaller than those in Korea. Similarly, the P value in the third table shows that the sample values in the first survey are not significantly smaller than those in the second survey in Japan. In the case of Korea, however, the sample values in the first survey are significantly smaller than those in the second survey. The second row of the table tests the opposite case. The Kolmogorov=Smirnov test shows that sample values in Japan are significantly larger than those in Korea in both surveys. In the case of the first and second surveys in Japan, the sample values in the first survey are significantly larger than those in the second survey in Japan.

(Place Table 5 here)

These tests imply that the distributions of management scores in Japan have shifted significantly to the right to a greater degree than those in Korea in both interview surveys. Since high scores in organizational management indicate a greater degree of transparency of organizational goals or aggressive organizational reform we can conclude that overall, either the organizational targets are clear to all employees in Japan in more cases than in Korea, or Japanese firms improve their organizational structures more aggressively than Korean firms, or both. As for human resource management, Japanese firms are more flexible in their human resource management than Korean firms. However, the flexibility of human resource management has improved in Korea, while it declined in Japan.

However, the difference in management scores partially reflects the difference in samples between the first and the second survey. When we limit the sample to be the same and consistent between two surveys for Japan, the management scores in these samples show similar patterns to those in the entire sample in the second survey (see Table 6). This implies that the shrinking gap in management scores between Japan and Korea cannot be entirely attributed to changes in the samples.

（Place Table 6 here）

3-3 Features of the results in the second survey

In the second survey, we asked additional questions to shed some light on management styles in Japanese and Korean firms and the market conditions that they face. Table 7 summarizes the responses to the supplementary questions. Question 1 in the second survey asks for an outline of the business and the economic environments that Korean and Japanese firms face. As for the first question in Question 1 -- that asks the main market for a firm -- almost two thirds (2/3) of Japanese firms answered that they sell more than 75 percent of their products in their domestic market. On the other hand, less than half of the Korean firms would say the same (see Table 7-1). Responses to the fourth question in Question 1 – that asks about the competitive environment -- also differs greatly between Japan and Korea. While more than half of the Japanese firms have six competitors or more, only 40% of the Korean firms would say the same (see table 7-2).

(Place Table 7 here)

It is often argued that the major difference between Japanese and Korean firms is the speed of the decision-making process. In the second survey, we ask questions related to this issue. Table 7-3 illustrates that it takes much less time to change the existing targets of the firm for Korean firms than for Japanese firms, based on responses to the second question in Question 3-3-4. While 65 percent of Korean firms revise organizational goals and other production processes within 3 months, it takes more than 6 months for approximately three fourths (3/4) of the Japanese firms to reach similar decisions.

However, in Table 7-4, constructed from responses to Question 9-1, over 40 percent of Japanese firms responded that less than 20 percent of the time before the project begins is spent on the "nemawashi" informal consensus building. On the other hand, approximately 60 percent of Korean firms spend 20-60 percent of their time on this consensus building. Yet, considering the time it takes for Japanese firms to change its targets, we cannot conclude this preparations is shorter for Japanese firms than Korean firms. Based on the information in Table 7-3, it takes ten months for organizational decisions to be made in Japanese firms. Since the time spent on the informal consulting building constitutes 20 percent of that time, that is two months. On the other hand, Korean firms spend on average of three months to make organizational decisions. Then, 40 percent of the three months would be spent on this consensus building, which would be only 1.2 months.

However, Table 7-5 with the results of the supplementary question in Question 9-1 shows that the time it takes to decide on new projects is not necessarily shorter for the Korean firms. In Japan, the cases can be extreme: there are examples where decisions are made very quickly and those where decisions take more than six months. On the other hand, almost 60 percent of Korean firms need more than six months to make a decision on new projects. A similar trend is observed when it comes to the termination of existing projects in Table 7-6, with results from the supplementary question in Question 9-2. Contrary to common perceptions, a large fraction of Japanese firms take less time to make decisions than their Korean counterparts.

Lastly, we compare the amount of information shared with the manager at the establishment level by using the results from Questions 9-3 and 9-4. Table 7-7 indicates that only 12 percent of Korean firms share less than 40 percent of pertinent information to project managers while 40 percent of Japanese firms do. This indicates that, overall, Korean firms give more decision-making authority to project managers than Japanese firms, and that decentralization is more common in Korea. Table 7-8 also shows that the share of information obtained by a project manager is via informal routes and is not necessarily higher in Japan than in Korea.

4. Are Management Practices Related to Firm Performance?

Using the scores on management practices explained in the previous section, we examine whether an improvement in firm performance is associated with better management practices. Modifying Bloom and Van Reenen (2007) we estimate the following production functions:

$$(1)\quad \ln VA_i = const. + \alpha_1 MS_i + \alpha_2 \ln K_i + \alpha_3 \ln L_i + \varepsilon_i$$

Equation (1) is a standard production function using the management score (*MS*). As for *MS*, we take not only the average score in all interview questions, but also management scores in organizational management and human resource management.

VA is value added, *L* is labor input, *and K* is capital input. Bloom and Van Reenen (2007) constructed pseudo-panel data by matching management scores to other variables in the production function in the past ten years. With this they examined the long-term relationship between management practices and firm performance. Following them, we take the variables in Equation (1), except for the management score, from firm-level data from 2006 to 2008 and from 2009 to 2011.[6] When we estimate Equation (1) using all samples, we include a sector dummy, a year dummy, and the second survey dummy in the estimations.

Statistics of all variables used in the estimation except the management scores are summarized in Table 8-1. In Table 8-2, capital-labor ratios and average productivity of labor are calculated. It is shown here that the capital-labor ratios are consistently higher in the Korean firms, regardless of whether they are measured in medians or means using the number of workers, working hours, or the sum of wage payment as measurement of labor. The only exception is when it is measured as the mean using working hours. In contrast, the average productivity of labor and capital are higher in the Japanese firms measured in terms of value-added per labor.

(Place Table 8-1, 8-2 here)

4.1 Basic Estimation Results

We have first run regressions for each country data and for the merged data. The results are shown in Table 9. First, we

[6] The firm level data from 2006 to 2008 correspond to the management scores in the first survey and those from 2009 to 2011 correspond to the management scores in the second survey.

note that they show that the average management score has a positive and significant relationship with firm performance in Korea and Japan -- which is not found in the estimation using only the first survey in Miyagawa et al. (2010).

(Place Table 9 here)

Next, the average management score is divided into an organizational management score and a human resource management score. Table 9 shows that both management scores are significantly positive in Japanese firms and only the human resource management score is significantly positive in Korean firms. We find that the significance of the total management scores is mostly due to the impact of the human resource management score in both countries and the combined sample regressions. There is little impact of the organizational management score and its contribution is sometimes even negative in Miyagawa et al. (2010). Estimation results by using sub-samples are different from those using the whole sample. When we divide the entire sample into the manufacturing sector and the service sector, the results in the manufacturing sector in Japanese and Korean firms are similar to those using the entire sample. However, in the Japanese service sector, only the human resource management score is significantly positive. When we divide the entire sample into SME and large firms, the estimation results in SMEs in Korea and Japan are similar to those using the whole sample. However, in the estimation results in large firms, better performances in Korean firms are associated with high organizational management scores as well as high human resource management scores, while for Japanese large firms, only the organizational management score is related to improvements in firm performances.

From the coefficients of the estimated production functions, we are also able to compare output elasticities of capital and labor. We find in general that the output elasticity of labor is higher in Japan, and that the output elasticity of capital is higher in Korea except in the manufacturing sector and SMEs. In contrast, we note from Table 8-2 that average productivity of labor and capital are higher in Japan. The above facts imply that different production functions apply to Korean and Japanese firms.

4.2 Effects of Management Practices on Production Efficiencies

In the basic estimation, we assume that management practices affect Hicks-neutral technological progress. However, management practices may improve capital efficiency, labor efficiency or efficiencies of both production factors. To check these effects of management practices, we estimate the following equations,

(2-1) $\ln VA_i = const. + \beta_1 \ln K_i + \beta_2 \ln K_i * \ln MS_i + \beta_3 \ln L_i + \mu_i$

(2-2) $\ln VA_i = const. + \gamma_1 \ln K_i + \gamma_2 \ln L_i + \gamma_3 \ln L_i * \ln MS_i + \mu_i$

(2-3) $\ln VA_i = const. + \lambda_1 \ln K_i + \lambda_2 \ln K_i * \ln MS_i + \lambda_3 \ln L_i + \lambda_4 \ln L_i * \ln MS_i + \mu_i$

The results are reported in Table 10. Table 10-1 shows that the total average score significantly improves capital efficiency in Korea and Japan. When we examine the contributions of the organizational management score and human resource management score to capital efficiency, both management scores contribute to capital efficiency in Japan and human resource management score contributes to capital efficiency in Korea. Table 10-2 shows the case of labor efficiency. In Table 10-2, we find significant contributions of the total management score to labor efficiency only in Korea. As in Table 10-1, strong human resource management scores significantly improve labor efficiency in Korea.

(Place Table 10 here)

Finally we estimate Equation (2-3). The estimation results in Table 10-3 show the significant and positive contributions of management scores to capital efficiency only in Japanese firms. However, we do not find the significant contributions of management scores to labor efficiency in either country. [7]

4.3. Estimation results considering causality

As the previous estimations examined the contemporaneous relationships between management practices and firm performance, we are not able to examine the effects of management practices on firm performances. Then, we estimate a production function for the period from 2009 to 2011 by using management scores in the first survey that was conducted in 2008.[8]

Estimation results are shown in Table 11. In Table 11, although we do not find a positive and significant effect of the total average management score on firm performances, we do find that organizational management score affects firm performances. [9]

[7] We also estimate Equations (2-1), (2-2), and (2-3) by using sub-samples. In the estimations in Equations (2-1) and (2-2), the organizational management scores contribute to capital and labor efficiencies in large firms or service firms in Korea. We also find the significant contribution of human resource management score to capital efficiencies of manufacturing firms and SMEs and to labor efficiencies of SMEs in Japan. Other results are similar to Tables 10-1 and 10-2. In the sub-sample estimation of Equation (2-3), we find no significant contributions of management scores to efficiencies of production factors.

[8] We estimate a production function including management scores in the first survey only in Japan because we are not able to obtain enough financial statements that correspond to the management score in the first survey in Korea.

[9] When we estimate a production function including the management scores in the first survey by using sub-samples in Japan, we find organizational management

(Place Table 11 here)

5. Conclusions and Discussions for Future Research

In the last twenty years, Korean firms have been catching-up with the Japanese firms and some firms have already overtaken the performance of competing Japanese firms. According to the growth accounting in Japan and Korea by Miyagawa and Takizawa (2011), accumulation in intangible assets have played a key role in explaining the difference in the economic performance of the two countries. Among several kinds of intangibles, management skills and human capital are crucial to the improvement in a firm's performance. Bloom and Van Reenen (2007) examined the effects of organizational and human resource management on firm performance using interview surveys conducted in France, Germany, the UK, and the US. Following their study, we conducted two interview surveys on organizational and human resource management in Japan and Korea.

Based on Bloom and Van Reenen (2007), we constructed scores on management practices in each firm based on the interview surveys. For organizational management, firms that have clear organizational targets, better communication amongst employees, and conduct organizational reforms would have a higher score. For human resource management, firms that evaluate human resources flexibly and strive to keep employees motivated would mark higher scores.

When we compared the distributions in the average management scores between Japanese and Korean firms, the mean value of the average management score in Japan was higher than that in Korea in both surveys except for the case of management scores in large firms in the second survey. However, the gaps in management scores between Japan and Korea in the second survey are smaller than those in the first survey in every aspect of management practices. The results are consistent with the fact that performances in Korean firms have rapidly caught up with those in Japanese firms, and some large Korean firms have overtaken some large Japanese firms.

The resulting Kolmogorov=Smirnov statistics show that the distributions in average score in Japan is significantly different from those in Korea. When we compare the first and second survey, the distribution of management scores in the second survey in Korea shifted to the right significantly from that in the first survey, while the distribution in the second survey in Japan also shifts but in the opposite direction of the Korean distribution.

Using these scores, we examined whether the improvement in firm performance is correlated to better

scores in service firms and large firms improve firm performances significantly.

management practices. Estimation results of a simple production function including the management score show that the measure indicating management practices has a positive and significant relationship to the improvement in firm performance in both countries. Even when we divide the management scores into organizational management and human resource management scores, both are significantly and positively correlated with better firm performance in large firms or SMEs in Japan and large firms in Korea. In Korean firms, high human resource management scores are associated with firm performance in all sub-sample estimations.

When we estimate a production function to examine the effects of management practices on efficiencies of production factors and include cross terms of management scores with production factors, we find that management scores improve capital efficiency in Japanese firms. On the other hand, in Korean firms human resource management scores improve efficiencies in both capital and labor.

Finally, we examine the effects of management practices on firm performance to estimate a production function in the second survey that include the management scores from the first survey. The estimation results show that the organizational management scores affect the improvement in firm performance in Japanese firms.

Overall estimation results show that better management practices are related to improvements in firm performance in Japan. In particular, a high organizational management score contributes to improved firm performance in Japanese firms. In the case of Korean firms, better management practices are associated with improved firm performance in large firms. In addition, the human resource management score is positively related to firm performance in every type of Korean firms. These results are consistent with the recent trends showing that Korean firms have caught up with Japanese firms and the performances in some large Korean firms have surpassed that of large Japanese firms.

Our results imply that to restore their competitiveness, Japanese firms should conduct organizational reform and improve human resource management. Since Miyagawa and Hisa (2013) show there is a drastic decline in investment in human resources at the aggregate level, the Japanese government should support enhanced human resource management. However, the better human resource management defined in Bloom and Van Reenen's score may not improve performance in the Japanese service firms, because the management score developed by Bloom and Van Reenen (2007) was applied only to the manufacturing sector.

Bloom, Propper, Seiler, and Van Reenen (2010) developed another list of interview questions to examine performances in public hospitals. In addition, Japanese firms in the service sector employ many non-regular workers who are not managed by human resource management for regular workers. Our next task is to examine human resource

management in the service sector based on the Japanese traditional labor market.[10]

[10] We obtained data for non-regular workers and college graduates in the first survey. Estimating a production function controlling these variables, we find that the human resource management score is significantly and positively correlated with firm performances.

Appendix 1: Questionnaire (The first interview survey)

1. Dissemination of management principles (vision)

- Does your company have management principles that it has upheld for many years?
- What efforts are in place to have those management principles shared by all employees? (For example, announcing them at morning assemblies, or making them portable by writing them on business cards etc.)
- Are management principles also supported by parties such as external partners (customers, suppliers) or the shareholders?

2. Implementation of organizational goals

- Are there specific quantifiable goals on multiple levels that go beyond being just a vision or a slogan, regardless of the level of the goals (such as company-wide, divisional or sectional goals)?
- Do you ensure that the goals amongst divisions are consistent?
- Is consistency maintained between these goals and the goals of management principles or long-term company-wide goals?

2-1. Implementation of organizational goals (setting target levels)

- For example, are the parameters for divisional or sectional target levels simply given to you in a top-down fashion? Or is the input of your division or section considered in the setting of these goals?
- Are the target levels appropriately set as non-binding challenges?
- Are target levels checked to ensure they are equitable between divisions or sections? Please provide an example of how they are checked. ( )

2-2. Implementation of organizational goals (penetration of goals)

- Are all employees aware of these goals?
- If goals exist on various levels (such as company-wide, divisional and sectional goals), do all employees understand the level of priority of the goals?
- Do all employees accept these target levels? Please provide an example if possible. ( )

2-3. Implementation of organizational goals (degree to which goals are met, checks on performance)

- Are checks conducted to see how far goals have been achieved? Please give an example of how such checks are conducted. ( )
- Are such checks conducted on a periodic rather than on an as-needed basis? And how frequently are such checks conducted? ( )
- Are additional checks conducted that are decided by the section or department involved itself, rather than just being mandated checks?

2-3-1. Implementation of organizational goals (permeation of degree to which goals are met, and results of performance checks)

- Are the results of such checks made openly available within your division?
- Are the results of such checks made openly available within not only your division but also between relevant divisions?
- Are adjustments made to ensure that the comparison of the attainment of goals between divisions is fair? (for example, by utilizing common measures such as overtime hours?)

2-3-2. Implementation of organizational goals (results of checks - response when goals have not been achieved)

- Is a meeting of managerial staff and employees held as soon as it is determined that the goals were not achieved?
- After investigations, are action items to improve shared throughout the division, and are measures for handling the failure to achieve the goals promptly implemented?
- Are problematic issues and countermeasures made thoroughly known throughout the relevant division, and if necessary, other divisions? Please provide an example if possible. ( )

2-3-3. Implementation of organizational goals (results of checks - response when goals have been achieved)

- When goals are achieved, are investigations conducted so that those goals are renewed on a continuous basis or so that higher goals are set?
- How long does it take for the operation / implementation of those goals after the higher goals have been set?
- Are these measures institutionalized at a company-wide level?

3. Informal communication within the organization

- Are measures and activities other than formal meetings used to enhance informal communication? (for example, informal meetings consisting only of key personnel)? Please provide an example.
  ( )
- Are informal meetings held between divisions?
- Are informal meetings held between persons of various ranks?

4. Implementation of organizational reform

- Has your company undergone any organizational reforms in the last ten years? When did these occur?
  ( )
- Did your company use a consulting company at that time? What was the cost? ( )
- Did you determine the results of the reform in a quantifiable manner? By what percentage did profits increase or by what percentage were costs reduced?
  ( )

4-1. Period of organizational reform or strategic change

- Did the implementation of the organizational reform take more than one year? How many years were spent including the preparation period? ( )
- Why was organizational reform necessary? Did this have to do with the leadership of senior management?
- During the organizational reform, did mid-level management also strive to achieve the reform, thereby giving the sense of unity in the company?

4-2. Scope of the effects of organizational reform

- Were the effects of the reform evident in the divisions or sections? If they were, please provide an example of the effects. ( )
- Were the effects of the reform evident between divisions, and not just within one division? If they were seen between divisions, please provide an example of the effects. ( )
- Were the effects of the reform evident between the company and the business partners, and not just within the company? If they were, please provide an example of the effects. ( )

4-3. Details of the organizational reform (delegation of authority)

- Was decision-making authority delegated to those in a lower position as a result of the organizational reform?
- Were posts simplified in conjunction with decision-making authority being delegated to those in a lower position?
- As a result, was there a change in the description of the job or the way of doing the job? Please provide an example. ( )

4-4. Details of the organizational reform (IT activities)

- Did the IT system make your company more streamlined, for example by reducing the amount of paper-based documentation?
- In the last decade, did your company launch organizational reform, rather than raise business efficiency, by utilizing the IT system?
- Did an opportunity to earn new profits arise as a result of the organizational reform based on the IT system? Please provide an example. ( )

5. Promotion system

- Does your company have a mainly performance-based promotion system?
- If the promotion system is mainly performance-based, does your company have a management-by-objectives system? If so, when did that system begin?

- Did the performance of the employees improve as a result of using the management-by-objectives system and introducing a performance-based promotion system?

6. Programs to improve motivation
- Are there any programs other than promotion or pay-related schemes to increase the motivation of the employees? Please provide an example. ( )
- Is that scheme used on an institutional basis throughout the company?
- Do you monitor when the employees' motivation, retention rate or job performance increases as a result of such a program?

7. Handling employees that perform poorly
- Are poor performers handled in some formalized way other than by verbal warnings?
- Does that include measures that are implemented faster than the average appointed term of office?
- Are the measures implemented as soon as a problem is confirmed (before a routine rotation)?

8. Handling employees that perform well
- Is it an employee's good performance shared within the division, for example by management praising employees at meetings?
- Do you have a system that ensures that good performance is linked to financial rewards or promotions?
- Was the motivation of the employees raised through introducing such a system?

9. Retaining talent
- How do you identify the high performance and core employees, mentioned in question 9, in your company? Please provide an example. ( )
- Are excellent employees treated well compared with ordinary employees? If so, how they are treated? ( )
- Do you have measures to prevent the loss of your excellent employees ?

10. Evaluating the interpersonal skills of managers
- Do the managers give clear criteria such as the degree to which persons of a lower position could be developed?
- Is there an incentive system, such as a pay-related or promotion-related system, to reward managers that have developed excellent staff of a lower position?
- Did the managers' motivation increase as a result of introducing such a system?

11. Training for development of human resources
- Is there training on an occupational ability basis or an assignment basis, aiming to improve the work skills of the employees? Over the course of one year, on average how long is spent on training? ( )

(Training on an occupational ability basis refers to training in specialist capabilities that are required in each field, such as management, business, research and development, and manufacturing. Assignment-based training refers to training in areas such as languages, OA, computing, and acquisition of official certifications.)
- Do business results improve as a result of these training activities? Please provide an example. ( )
- Are the effects of those training activities adaptable to other companies?

12. Developing human resources through OJT
- Is OJT performed on a daily basis?
  What percentage of the supervisor's working time is spent on providing instructions to those in a lower position? ( )
- Does OJT contribute to business results? Please provide an example. ( )
- Are the effects of OJT monitored? Please provide an example of the methods used. ( )

13. Employees' expertise
- Are employees rotated to different positions under a fixed schedule, such as once every two or three years?

- To improve the expertise of the employees, are they assigned to a position for a significant amount of time?
- Is there a systematic program in place to ensure the employees acquire some expertise?

Appendix 2: Questionnaire (Second interview survey)

1. Business environment and responses to changes

a. With regard to the market your company is operating in, what are the percentages of revenue from your domestic and overseas markets?
1. Domestic market accounts for 75% or higher.
2. Domestic market accounts for 50-75%.
3. Domestic market accounts for 25-50%.
4. Overseas market accounts for 75% or higher.

b. How do you see the competitive environment surrounding the market for your company's major product or service (i.e., the product or the service that has the largest share in your company's revenue)?

1. Mild
2. Medium
3. Intense
4. Highly intense

c. What is your market share of the major product or service which relates previous question?
1. About 0-5 %
2. About 5-10 %
3. About 10-25 %
4. 25% or higher

d. How many rival firms are competing for a larger market share?
1. None or one firm
2. Two to five firms
3. Six to ten firms
4. Eleven or more firms

e. What actions are typically taken when the market for your main product is favorable and prevailing prices are rising? (Please choose one or two that best describe the situation.)
1. Expand investment
2. Increase operating time to expand production capacity
3. No changes
4. Increase employees (transfer, or newly recruit employees)
5. Reduce advertising and marketing expenses

f. What actions are typically taken when the market for your main product remains stagnant?
1. Cut down operations (reduction in sales and production including restructuring)
2. Reduce prices
3. Develop production methods to save production costs
4. Explore new marketing methods
5. Improve product quality and design as well as develop new products

g. We would like to offer our deepest condolences to your employees who greatly suffered from the East Japan Earthquake that hit Japan on March 11, 2011. Please provide any examples of significant changes in corporate strategy caused by this unprecedented disaster, such as the relocation of production bases, or changes in product line-up.

Thank you for sharing your business environment with us so far.

We would appreciate it if we could obtain a brochure that explains your major product or service when we leave your office after completing today's interview. We would like to study it to have a better understanding of your company. (Yes/No)

Then, let us move on to topics concerning corporate visions, followed by goals/targets on a more operational

level. Questions can be answered 'Yes' or 'No'.

2. Production management system

2-1 Production system

2. Please describe your company's production system? Has your company introduced a system aimed at minimizing inventory on the production line?
3. Please let us know if your plant has a unique system of inventory management.
4. How does your company manage inventory? How do you maintain the proper balance between inventory management and smooth operation of the production line?

2-2 Reason that your company introduced the production system

2. What factors led to the introduction of your production system?
3. Is your inventory management system mainly designed to reduce costs?
4. Or do you believe that your system is more than just a cost-reduction method and that the system has far-reaching positive impacts on logistics, innovation and other systems?

2-3 Improvement of production process

2. How has your company improved the production process in the last five years?
3. How are problems regarding production processes typically identified and fixed? Please provide an example in which your workers recently identified and fixed a problem with regard to the production line.
4. Do factory workers take the initiative to suggest ideas for improving production process?

3. Organizational goals/targets

3-1 Questions about goal or target setting

2. Is each operating division responsible for setting its own goals/targets, rather than their being set at higher departmental levels?
3. In terms of the difficulty of achieving the goals/targets, does the company consider ways to maintain appropriate levels of the division's goals/targets (i.e., ensure they are not too difficult, not too easy)?
4. Does the company ensure that all the divisions are treated fairly in terms of difficulty of division's goals/targets? If any, can you provide an example of specific ways to manage these goals/targets?
( )

3-2 Questions about how goals/targets are shared by employees

2. Do all employees understand the goals/targets of their divisions?
3. If different goals/targets are established on various levels such as section, department, company etc., do employees understand how they relate to each other and what these priorities are?
4. Have most employees fully bought into the goals/targets and are motivated into action by them, rather than just "being aware of" the goals/targets?

3-3 Questions about monitoring the degree of achievement

2. Does your company monitor the achievement of the goals/targets? If so, can you provide an example of the monitoring method used? ( )
3. Is such monitoring conducted periodically? If so, what is the frequency that it is conducted? ( )
4. In addition to a system of institutional monitoring, do employees take the initiative to monitor their own achievements?

3-3-2 Questions about how monitored results are utilized

2. Do employees share the monitored results of achievement, regardless of whether the results are good or bad?
3. Do employees have easy access to the monitored results of achievement of the other departments with whom they work closely?
4. Are there specific ways to make a fair evaluation of achievement across divisions such as the measurement of overtime etc.? If so, can you provide an example of such evaluation method? ( )

3-3-3 Questions about cases in which goals/targets are not achieved

2. In case set goals/targets are not achieved, do managers and staff have a meeting in a timely manner?
3. When the mangers and staff come up with ideas for improving performance in such meetings, are these

ideas shared by staff in the division and put into action in a timely manner?
4. Does the company ensure that such ideas for improvement are also shared by the other divisions? Please provide an example of specific ideas for improvement that are shared by the other division ( )

3-3-4 Questions about cases in which goals/targets are achieved
2. When the goals/targets are met, does your company consider revising them to higher goals/targets?
3. Is the time frame required to revise the goals/targets and to implement actions toward such new goals/targets within three months? How long is the time frame? ( )
4. When revising the goals to higher level after earlier goals are achieved, are such actions institutionalized as part of a formal corporate process?

4. Human resource management

4-1 We understand that various measures are taken to improve employee motivation.
2. Do managers evaluate employees mainly on the basis of performance (performance-based system)? When was such performance-based evaluation system introduced? (Year)
3. Do you use incentives other than promotion and compensation to help improve the motivation of employees? If so, can you provide an example? ( )
4. Do you monitor how these incentives lead to better outcome, such as greater motivation, higher retention rate or better financial results?

4-2 When we discussed organizational issues previously, we touched on the management and achievement of goals. Here, we would like to ask similar questions in terms of human resource management.
2. Do managers take any specific measures other than verbal advice to employees when their achievements do not reach targets?
3. Do such measures include transferring the employee to another position even if he or she has been in their current position for less than the average rotation period?
4. Do such internal transfers take place promptly, and no later than the timing of regular rotation?

4-3 Questions regarding high-achieving employees
2. When an employee achieves a high performance, do managers announce this within the division by praising the employee at meetings, for example?
3. Does your company adopt a compensation and promotion system that is aligned with performance targets and achievements?
4. Have you seen improvements in motivation by adopting such performance-based systems of compensation and promotion?

4-4 Questions about managers
2. Does the company provide managers with clear guideline as to how they should cultivate the talent of their subordinates?
3. Does your company adopt a promotion or compensation system in which managers are incentivized to foster high-achieving employees?
4. Have you seen an improvement in the motivation of managers by adopting such an incentive scheme?

5. Human resource development

5-1 Questions about human resource development
2. Does your company conduct employee training on a regular basis to develop their business skills?
a. How many days a year, on average, does an employee spend on training? (days)
b. There are two types of corporate training programs: 1) functional training designed to obtain technical knowledge and 2) theme-based training designed primarily to obtain a certificate. Which do you focus on?
- Focus on functional training
- Focus on theme-based training
- Both training are conducted roughly equally.

3. Do these training programs contribute to improving financial results? If so, please provide an example. ( )
4. Do employees obtain a high level of transferable skills that could be utilized soon after she or he moves to

another company?

5-2 Questions about OJT (on-the-job training), which is also an important training program
2. Does on-the-job training (OJT) take place during daily operations? Roughly what percentage of a manager's time is allocated to such OJT?
If it is difficult to specify the corporate-wide percentage, please base your answers on one of the divisions.
a. On average (throughout the company) (%)
b. Front office/factory (%)
c. Back office (%)
d. Other specialist divisions (%)
3. Does this OJT contribute to improving financial results? If so, please provide an example. ( )
4. Do you monitor the results of OJT? If so, please provide an example of how you monitor them.
( )

5-3 We understand that job rotation leads to the development of a company's human resources.
2. Ia your company's job rotation program flexible? Do you think, for example, that the majority of employees are transferred within the base rotation period of two to three years?
3. Do some employees stay in one division for a long period to cultivate a high level of specialized skill and expertise?
4. Do you have a human resource development program that integrates various aspects such as training, OJT and job rotation that will help acquire a high level of skill and expertise?

6. Acquisition of human resources

6-1 Questions about your workforce, human resources itself
2. Is your company able to identify core skilled workforce (star performers) in each division? What quality is typically shared by such star performers? ( )
3. Are these star performers treated differently from other employees? If so, in what regard are they treated differently? ( )
4. Has your company been successful in retaining your top talent?

6-2 An increasing number of Japanese companies are interested in utilizing non-Japanese employees or management.
2. Does your company have non-Japanese employees or management? What is the percentage of non-Japanese to total number of management and employees? (%)
3. Do overseas subsidiaries have non-Japanese management?
4. Do your board members (head office) include any non-Japanese persons?

7. Lifetime employment system

Last topic is lifetime employment.
How does your company view the lifetime employment system?
1. Important
2. Somewhat important
3. Somewhat unimportant
4. Unimportant

8. Relationships between employees (mainly full-time) and management

Which of the followings best describe your company situation regarding how corporate strategy is formulated?

1. Top down decision making
2. There are regular meetings between management and employees regarding compensation and human resource management, but corporate strategy is determined only by the management.
3. In addition to 2, informal communication is common, where management tries to reflect the opinions of employees when it comes to issues related to compensation and human resource management, though corporate strategy is decided only by the management.
4. Communication between management and employees plays a key role in reflecting employees' opinions not only in human resource issues but also in corporate strategy.

9. Decision making and information flow

9-1 Let us suppose that multiple divisions are involved to discuss a new business project. If we say the total time spent from starting the feasibility study to launch the project is 100%, what is the percentage of the time spent on nemawashi (i.e., the consensus-building process outside of formal meetings)?
1. 60% or above
2. 40-59%
3. 20-39%
4. 19% or below

9-2 Let us assume the case in which you must close or exit an existing business. Let us also say that the total time spent from the formation of the project team for winding down the business to start implementing the plan is 100%, what is the percentage of the time spent on nemawashi (i.e., consensus-building process outside of formal meetings)?
1. 60% or above
2. 40-59%
3. 20-39%
4. 19% or below

Next, let us cover topics on information flow within the company.

9-3 Let us suppose that the total amount of strategic information within the company is 100%, what percentage of information does the person who is in charge of one business unit have?
1. 40% or below
2. 40-60%
3. 60-80%
4. 80% or above

9-4 Let us suppose that the total amount of strategic information that one employee has is 100%, what percentage of information does the person obtain informally (e.g., unofficial dinner with colleagues or bosses) rather than through formal ways such as conversation with the boss during business hours or corporate meetings?
1. 20% or below
2. 20－40%
3. 40－60%
4. 60% or above

10. Organizational reform

10-1 Please let us know whether your company underwent organizational reform in the past and how great the reform was.
1. Has the company undergone an organizational reform in the last 10 years? If yes, we will continue questions. If no, we will move to question 5.
2. Did the organizational reform entail changes to the existing organizational framework (e.g., was there restructuring of existing departments and/or sections)?
3. Did the organizational reform go beyond the creation of a new business groups or the consolidation of existing business groups?
4. Was the organizational reform conducted on a far greater scale that involved company-wide reform? The examples include transformation from a functional organization to a divisional organization or to a matrix organization, transition to a divisional organization or creation of a pure holding company.

Please allow us to continue asking about organizational reform.
a. In which year did the organizational reform start? ( )
b. How many employees were involved in planning and/or implementing the reform as a percentage of total employees? How long did the reform take?
(%) ( )
c. What was the major reason that your company decided to implement organizational reform? ( )
(If the answer is not apparent, we ask you to consider the following possibilities).

- It was clear that the existing organizational structure was not effective to save the company from further deteriorating business performance.
- Though business performance was not deteriorating, we felt it necessary to transform the organization as a countermeasure to competitors who had made similar reforms.
- Though business performance was not deteriorating, our external stakeholders such as major customers advised us to do so.
- Though business performance was not deteriorating, we felt it necessary to better meet the changing needs of the future.

d. What was the major focus of the objective of such organizational reform?
(If the answer is not apparent, we ask you to consider the following possibilities).
- The major objective was to meet customer demand in a more timely manner.
- The major objective was to increase capacity to develop new products, services or new production processes
- Instead of volume or quantity, the major objective was to enhance the ability to offer better quality of new products or services.
- The major objective was to reduce costs, such as labor cost.

We imagine that much internal coordination was required to reform the organization. Such a reform must have resulted in a number of changes. Please answer Yes or No to following questions.

10-2 Questions about the organizational reform process.
2. Was the time required for the proposed organizational reform to be accepted by a majority of employees less than one year?
3. Did a majority of employees work with middle management in line with the proposed reform after the plan was accepted?
4. Did employees suggest other constructive alternatives regarding organizational reform?

10-3 Questions about changes due to organizational reform
2. Was some of the decision-making authority delegated to lower-level managers/employees as a result of organizational reform?
3. Did such delegation of decision-making authority help simplify the organizational structure?
4. Did the organizational reform lead to changes in terms of what employees do and how they view their jobs? If any, please provide an example. （ ）

10-4 Questions about the relationship between IT investment and organizational reform, which are generally considered to be correlated.
2. Did your company step up investment in IT after the organizational reform compared with the same period prior to the reform?
3. Did your company make company-wide efforts to improve the utilization of information technology, rather than each section or division making IT-related plans individually?
4. Did your company strengthen IT management to include not only the internal network but also external business partners such as customers and/or suppliers?
Please provide an example where an effective use of IT helped generate a new business opportunity, if any.
( )

10-5 We understand that a large budget is generally required for organizational reform. Please let us know about funding the reform, which is usually one of the challenges.

What do you estimate is spent on organizational reform as a percentage to your company's annual revenue?
(%)
a. How does your company raise these funds required for reorganization?
b. Please provide a ballpark figure of the percentage of each source of funds to the budget?
Internally-generated cash flow (%)
Borrowings (%)
Issuance of bonds (%)
Issuance of stocks (%)

Other (%)
Please specify if you choose "other". ( )

Next question is asked only to those who answered "borrowings" in the question b.
c. How did lenders such as banks evaluate the proposed organizational reform?
Please choose the response closest to lenders' attitude.
- The reorganization plan was incorporated into their evaluation and reflected in borrowing conditions (loan amount, interest rate, maturity, security etc.).
- The reorganization plan was evaluated but was not reflected in borrowing conditions.
- The reorganization plan was not evaluated.

Next question is asked only to those who did not choose "borrowings" to the above question b.
c'. Did your company discuss with the banks the possibility of borrowing to fund your reorganization? How did banks evaluate the proposed plan of organizational reform?

Next question is asked only to those who answered yes to the above question c'.
Please choose the response closest to the lenders' stance.
- The banks analyzed the reorganization plan and tried to reflect it in borrowing conditions (loan amount, interest rate, maturity, security etc.).
- The banks analyzed the reorganization plan but it did not seem to be reflected in borrowing conditions.
- The banks did not analyze the reorganization plan.

d. If reorganization costs can be recorded as assets, over how many years do you think they should be amortized / depreciated?
Please choose the one closest to your opinion.
- Over 7 years
- 5-6 years
- 3-4 years
- 2 years
- 1 year

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Table 1 Outline of Intangible Assets Interview Survey in Japan and Korea

	Japan		Korea	
	First	Second	First	Second
Survey period	Feb-Sep, 2008	Oct-March, 2011 July-Sep, 2012	May-Sep, 2008	Oct, 2011-May, 2012
Firms surveyed	Machinery industries (Electric, Information and communication, Transportation, Precision), Information service, Media Service, and Retail industries	All industries, Publicly Traded Firms	Machinery industries (Electric, Information and communication, Transportation, Precision), Information service, Media Service, and Retail industries	All industries, Publicly Traded Firms
Number of surveyed firms that responded	573	402	350	505
Response rate	52.8%	22.2%	59.2%	28.9%
Organizations that conducted Surveys	Research Institue of Economy, Trade and Industry	Research Institue of Economy, Trade and Industry	Japan Center for Economic Research	Samsung Economic Research Institue

Table 2 Distribution of Industries Surveyed

(%)

	Japan		Korea	
	First	Second	First	Second
Manufacturing	33.9	67.7	84.9	79.0
Services	66.1	32.3	15.1	21.0

Table 3 Size Distribution of Surveyed Firms

(%)

Number of employees	Japan		Korea	
	First	Second	First	Second
～300	44.0	42.5	72.8	54.3
300～499	15.3	14.7	10.5	17.0
500～	40.7	42.8	16.7	28.7

Table 4 Management Scores Based on the Interview Surveys

The 1st survey	Total			Japan			Korea		
	N	mean	variance	N	mean	variance	N	mean	variance
MS (all questions)									
All samples	923	2.458	0.321	573	2.609	0.243	350	2.211	0.351
Manufacturing firms	491	2.343	0.336	194	2.606	0.245	297	2.171	0.321
Service firms	432	2.588	0.273	379	2.610	0.243	53	2.433	0.468
Large firms	397	2.643	0.269	304	2.697	0.220	93	2.469	0.394
Small and Medium-sized firms	488	2.317	0.309	239	2.517	0.241	249	2.126	0.299
MS (Organizational management)									
All samples	923	2.593	0.463	573	2.749	0.398	350	2.339	0.466
Manufacturing firms	491	2.493	0.459	194	2.782	0.367	297	2.305	0.430
Service firms	432	2.707	0.444	379	2.732	0.414	53	2.528	0.634
Large firms	397	2.759	0.436	304	2.837	0.387	93	2.507	0.517
Small and Medium-sized firms	488	2.472	0.433	239	2.664	0.363	249	2.287	0.432
MS (Human resource Management)									
All samples	923	2.356	0.398	573	2.504	0.305	350	2.115	0.458
Manufacturing firms	491	2.231	0.424	194	2.475	0.322	297	2.071	0.428
Service firms	432	2.499	0.330	379	2.518	0.296	53	2.361	0.562
Large firms	397	2.556	0.323	304	2.592	0.274	93	2.440	0.470
Small and Medium-sized firms	488	2.202	0.402	239	2.407	0.323	249	2.005	0.400

The 2nd survey	Total			Japan			Korea		
	N	mean	variance	N	mean	variance	N	mean	variance
MS (all questions)									
All samples	907	2.541	0.311	402	2.568	0.226	505	2.518	0.379
Manufacturing firms	671	2.530	0.336	272	2.552	0.242	399	2.515	0.401
Service firms	236	2.570	0.240	130	2.603	0.191	106	2.530	0.300
Large firms	462	2.670	0.284	231	2.642	0.213	231	2.698	0.355
Small and Medium sized firms	445	2.406	0.305	171	2.469	0.226	274	2.367	0.350
MS (Organizational management)									
All samples	907	2.669	0.413	402	2.694	0.322	505	2.649	0.485
Manufacturing firms	671	2.662	0.442	272	2.668	0.343	399	2.657	0.511
Service firms	236	2.691	0.330	130	2.750	0.276	106	2.618	0.391
Large firms	462	2.755	0.411	231	2.755	0.336	231	2.755	0.487
Small and Medium sized firms	445	2.580	0.401	171	2.612	0.293	274	2.560	0.468
MS (Human resource Management)									
All samples	907	2.444	0.414	402	2.474	0.313	505	2.420	0.495
Manufacturing firms	671	2.432	0.443	272	2.465	0.320	399	2.409	0.526
Service firms	236	2.479	0.334	130	2.492	0.300	106	2.463	0.379
Large firms	462	2.606	0.380	231	2.557	0.314	231	2.655	0.444
Small and Medium sized firms	445	2.276	0.395	171	2.361	0.291	274	2.223	0.454

Table 5 Kolmogorov-Smirnov Test

First survey	All questions		Organizational Management		Human Resource Management	
	Distance	p-value	Distance	p-value	Distance	p-value
Japan<Korea [1]	0.0067	0.981	0.0054	0.987	0.0091	0.965
Japan>Korea [1]	−0.3261 ***	0	−0.2728 ***	0	−0.2939 ***	0
Combined test	0.3261 ***	0	0.2728 ***	0	0.2939 ***	0

Note 1. 'Japan <Korea' means that sample values in Japan are smaller than those in Korea, and vice versa. 2. * p<0.10, ** p<0.05, and *** p<0.01.

Second survey	All questions		Organizational Management		Human Resource Management	
	Distance	p-value	Distance	p-value	Distance	p-value
Japan<Korea [1]	0.0604	0.195	0.0482	0.354	0.0472	0.369
Japan>Korea [1]	−0.1100 ***	0.004	−0.1002 **	0.011	−0.1086 ***	0.005
Combined test	0.1100 ***	0.009	0.1002 **	0.022	0.1086 **	0.01

Note 1. 'Japan <Korea' means that sample values in Japan are smaller than those in Korea, and vice versa. 2. * p<0.10, ** p<0.05, and *** p<0.01.

Japan	All questions		Organizational Management		Human Resource Management	
	Distance	p-value	Distance	p-value	Distance	p-value
Japan 1st<Japan 2nd[1]	0.0173	0.869	0.053	0.265	0.0174	0.866
Japan 1st>Japan 2nd[1]	−0.0806 **	0.047	−0.1033 ***	0.006	−0.0645	0.14
Combined test	0.0806 *	0.093	0.1033 **	0.013	0.0645	0.279

Note 1. 'Japan <Korea' means that sample values in Japan are smaller than those in Korea, and vice versa. 2. * p<0.10, ** p<0.05, and *** p<0.01.

Korea	All questions		Organizational Management		Human resource management	
	Distance	p-value	Distance	p-value	Distance	p-value
Korea 1st<Korea 2nd[1]	0.2151 ***	0	0.1992 ***	0	0.2029 ***	0
Korea 1st>Korea 2nd[1]	−0.0033	0.996	0	1	−0.0026	0.997
Combined test	0.2151 ***	0	0.1992 ***	0	0.2029 ***	0

Note 1. 'Japan <Korea' means that sample values in Japan are smaller than those in Korea, and vice versa. 2. * p<0.10, ** p<0.05, and *** p<0.01.

Table 6 Comparison of Management Scores in Corresponding Industries in the First and Second Surveys in Japan

	First survey			Second survey (corresponding industries)			Second survey (entire sample)		
	N	mean	variance	N	mean	variance	N	mean	variance
MS (all questions)									
All samples	573	2.609	0.243	105	2.545	0.266	402	2.568	0.226
Manufacturing firms	194	2.606	0.245	67	2.516	0.269	272	2.552	0.242
Service firms	379	2.610	0.243	38	2.596	0.265	130	2.603	0.191
Large firms	304	2.697	0.220	63	2.638	0.244	231	2.642	0.213
Small and Medium-sized firms	239	2.517	0.241	42	2.405	0.272	171	2.469	0.226
MS (Organizational management)									
All samples	573	2.749	0.398	105	2.656	0.370	402	2.694	0.322
Manufacturing firms	194	2.782	0.367	67	2.642	0.419	272	2.668	0.343
Service firms	379	2.732	0.414	38	2.680	0.293	130	2.750	0.276
Large firms	304	2.837	0.387	63	2.735	0.395	231	2.755	0.336
Small and Medium-sized firms	239	2.664	0.363	42	2.536	0.318	171	2.612	0.293
MS (Human resource Management)									
All samples	573	2.504	0.305	105	2.462	0.356	402	2.474	0.313
Manufacturing firms	194	2.475	0.322	67	2.422	0.323	272	2.465	0.320
Service firms	379	2.518	0.296	38	2.533	0.416	130	2.492	0.300
Large firms	304	2.592	0.274	63	2.566	0.340	231	2.557	0.314
Small and Medium-sized firms	239	2.407	0.323	42	2.307	0.346	171	2.361	0.291

Table 7 Summary of Responses to Additional Questions in the Second Interview Survey

Table 7－1 **Share in Domestic Market (based on Question 1a in the second interview survey)**

（%）

	Japan	Korea
Above 75%	66.4	43.6
50%～75%	16.7	18.2
25～50%	9.7	18.8
Less than 25%	6.0	19.4

Table 7－2 **Number of Competitive Firms (based on Question 1d in the second interview survey)**

（%）

	Japan	Korea
One firm	1.5	2.2
From 2 to 5 firms	40.8	52.9
From 6 to 9firms	20.0	19.8
Above 10 firms	36.5	25.1

Table 7-3 **Months Required to Revise Organizational Goals and Implement Measures to Attain Them (based on the second question in Question 3-3-4 in the second interview survey)**

（%）

	Japan	Korea
Less than one month	5.8	25.6
From 1 to 3 months	16.0	40.1
From 3 to 6 months	4.6	17.5
From 6 months to one year	63.2	10.4
Above one year	10.4	6.3

Table 7-4 **The Share of 'nemawashi' Hours Required for Organizational Decision for Starting New Business (based on the Question 9-1 in the second interview survey)**

(%)

	Japan	Korea
Above 60%	10.1	17.4
40%～59%	18.3	29.6
20～39%	27.5	29.8
Less than 20%	44.2	23.0

Table 7-5 **Period from the Initial Consideration of New Business until It Begins (based on the supplementary question in Question 9-1 in the second interview survey)**

(%)

	Japan	Korea
Less than one month	26.3	2.0
From 1 to 3 months	17.9	11.6
From 3 to 6 months	8.9	21.6
From 6 months to one year	21.3	37.5
One year and above	24.3	27.3

Table 7-6 **Period from the Initial Consideration of Exit until the company Exits (based on the supplementary question in Question 9-2 in the second interview survey)**

(%)

	Japan	Korea
Less than one month	26.6	4.9
From 1 to 3 months	17.1	16.3
From 3 to 6 months	13.5	20.4
From 6 months to one year	23.5	29.5
One year and above	18.0	28.9

Table 7－7 **Share of Information Held by Managers of the Total Information within a Firm (based on Question 9-3 in the second interview survey)**

（%）

	Japan	Korea
Above 80%	12.7	29.9
60%～79%	17.3	34.5
40～59%	29.4	24.0
Less than 40%	40.8	11.7

Table 7－8 **Share of Informal Information to the Total Information Held by Managers (based on the Question 9-4 in the second interview survey)**

（%）

	Japan	Korea
Above 60%	3.2	4.0
40%～59%	7.1	12.3
20～39%	25.7	34.1
Less than 20%	64.0	49.5

Table 8-1 Summary of Statistics

Japan					
	Obs.	Mean	Standard dev.	Min	Max
Management score (All)	2715	2.6	0.48	1.21	4
Organizational management score	2715	2.73	0.6	1	4
Human resource management score	2715	2.5	0.55	1	4
VA (million US$)	2715	99.84	343.62	0.1	4296.68
K (million US$)	2715	320.96	1272.58	0	21464.55
L	2715	762.94	2965.9	0.01	47181
Manufacturing dummy	2715	0.48	0.5	0	1

Korea					
	Obs.	Mean	Standard dev.	Min	Max
Management score (All)	2122	2.43	0.62	1	4
Organizational management score	2122	2.56	0.7	1	4
Human resource management score	2122	2.34	0.71	1	4
VA (million US$)	2122	91.73	389.63	0	6053.74
K (million US$)	2122	230.61	1002.76	0.03	12599.07
L	2122	194.91	945.72	0	18226
Manufacturing dummy	2122	0.83	0.37	0	1

Table 8-2: Capital/Labor Ratios and Average Productivity

Variable	Country	Obs.	Mean	Standard dev.	Min.	Median	Max.
K / L	Japan	2715	229.76	915.53	0	0.11	28803.75
	Korea	2122	159.29	314.05	0	73.39	3809.55
K / Wage	Japan	2709	13.28	32.23	0	2.37	410.55
	Korea	1253	4.78	9.81	0.03	2.51	142.48
VA / L	Japan	2715	37.43	97.42	0	0.08	1785.66
	Korea	2122	66.8	89.99	0	51.03	839.27
VA / K	Japan	2706	10.5	70.28	0	0.59	2331.49
	Korea	2122	1.52	5.98	0	0.59	176.42

Note: VA and K are value-added, and capital respectively, and are in millions of Yen. L is the number of regular workers. LH is the number of regular workers multiplied by hours worked.

Table 9-1 Estimation Results Using by Country

Country	Japan	Korea	Japan	Korea	Japan	Korea	Japan	Korea
Management score (All)	0.129***	0.131***						
	<0.039>	<0.056>						
	(3.686)	(4.195)						
Organizational management score			0.102***	0.029			0.088***	-0.063**
			<0.039>	<0.014>			<0.034>	<-0.030>
			(3.689)	(1.076)			(2.919)	(-2.054)
Human resource management score					0.078***	0.155***	0.041	0.188***
					<0.027>	<0.075>	<0.014>	<0.091>
					(2.582)	(5.660)	(1.260)	(5.927)
lnK	0.193***	0.426***	0.193***	0.433***	0.193***	0.423***	0.193***	0.423***
	<0.306>	<0.502>	<0.306>	<0.510>	<0.307>	<0.498>	<0.306>	<0.498>
	(17.345)	(29.381)	(17.332)	(29.938)	(17.341)	(29.210)	(17.337)	(29.266)
lnL	0.888***	0.782***	0.891***	0.796***	0.893***	0.774***	0.888***	0.773***
	<1.654>	<1.360>	<1.658>	<1.383>	<1.663>	<1.344>	<1.653>	<1.343>
	(40.053)	(22.013)	(40.334)	(22.389)	(40.377)	(21.799)	(40.049)	(21.786)
constant	0.475***	0.891***	0.517***	0.980***	0.582***	0.928***	0.468***	1.005***
	(3.808)	(5.318)	(4.353)	(5.752)	(4.903)	(5.628)	(3.752)	(5.947)
Manufacturing dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
The second survey dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	2715	2122	2715	2122	2715	2122	2715	2122
Adjusted R2	0.706	0.678	0.706	0.676	0.705	0.68	0.706	0.681

Note 1. Standardised partial regression coefficients in angle brackets, t statistics in parentheses.

Note 2. Standardised partial regression coefficients are the coefficients found by the regression of standardised dependent variable on standardised explanatory ones. They are used in case we compare the relationship of the impact of explanatory variables on the dependent variable among different models.

Note 3. * p<0.10, ** p<0.05, and *** p<0.01.

Table 9-2 Estimation Results by Sector

lnVA	Manufacturing								Service							
	Japan	Korea	Japan	Korea	Japan	Korea	Japan	Korea	Japan	Korea	Japan	Korea	Japan	Korea	Japan	Korea
Average score	0.168***	0.096***							0.036	0.246***						
	<0.050>	<0.043>							<0.012>	<0.084>						
	(4.063)	(2.968)							(0.737)	(2.614)						
Organizational management score			0.091***	0.009			0.039	-0.068**			0.057	0.088			0.067*	-0.071
			<0.033>	<0.004>			<0.014>	<-0.035>			<0.024>	<0.035>			<0.029>	<-0.028>
			(2.633)	(0.314)			(1.024)	(-2.133)			(1.506)	(1.104)			(1.669)	(-0.758)
Human Resource management score					0.144***	0.123***	0.127***	0.158***					-0.007	0.276***	-0.034	0.317***
					<0.050>	<0.063>	<0.044>	<0.081>					<-0.003>	<0.105>	<-0.013>	<0.120>
					(4.060)	(4.331)	(3.248)	(4.822)					(-0.160)	(3.266)	(-0.738)	(3.159)
lnK	0.470***	0.482***	0.471***	0.490***	0.473***	0.478***	0.471***	0.479***	0.099***	0.340***	0.100***	0.346***	0.099***	0.336***	0.100***	0.335***
	<0.580>	<0.534>	<0.581>	<0.543>	<0.584>	<0.530>	<0.581>	<0.532>	<0.172>	<0.482>	<0.173>	<0.490>	<0.172>	<0.475>	<0.173>	<0.474>
	(24.292)	(26.775)	(24.186)	(27.328)	(24.505)	(26.643)	(24.301)	(26.733)	(7.849)	(12.819)	(7.880)	(13.004)	(7.825)	(12.667)	(7.874)	(12.610)
lnL	0.724***	0.732***	0.730***	0.740***	0.725***	0.723***	0.724***	0.718***	0.859***	0.794***	0.856***	0.818***	0.863***	0.793***	0.859***	0.800***
	<1.276>	<1.334>	<1.286>	<1.347>	<1.277>	<1.317>	<1.275>	<1.308>	<1.647>	<1.165>	<1.643>	<1.201>	<1.656>	<1.164>	<1.648>	<1.174>
	(21.137)	(17.561)	(21.252)	(17.729)	(21.162)	(17.344)	(21.127)	(17.221)	(31.842)	(10.649)	(32.052)	(10.916)	(32.152)	(10.775)	(31.871)	(10.777)
Cons	-0.535***	0.470***	-0.390**	0.546***	-0.480***	0.510***	-0.527***	0.607***	6.157***	5.401***	6.093***	1.701***	6.269***	5.382***	6.148***	1.592***
	(-3.373)	(2.725)	(-2.539)	(3.095)	(-3.157)	(3.005)	(-3.318)	(3.458)	(34.055)	(15.903)	(37.032)	(4.166)	(37.852)	(16.888)	(34.006)	(3.934)
The second survey dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1308	1763	1308	1763	1308	1763	1308	1763	1407	359	1407	359	1407	359	1407	359
Adj. R-Squared	0.811	0.679	0.809	0.677	0.811	0.681	0.811	0.681	0.647	0.672	0.647	0.667	0.647	0.675	0.647	0.675

Note 1. Standardised partial regression coefficients in angle brackets, t statistics in parentheses.

Note 2. Standardised partial regression coefficients are the coefficients found by the regression of standardised dependent variable on standardised explanatory ones. They are used in case we compare the relationship of the impact of explanatory variables on the dependent variable among different models.

Note 3. * p<0.10, ** p<0.05, and *** p<0.01.

Table 9-3 Estimation Results by Size

lnVA	SME								Large							
	Japan	Korea	Japan	Korea	Japan	Korea	Japan	Korea	Japan	Korea	Japan	Korea	Japan	Korea	Japan	Korea
Average score	0.128***	0.115***							0.055	0.061						
	<0.039>	<0.050>							<0.022>	<0.029>						
	(3.001)	(3.473)							(1.291)	(0.873)						
Organizational management score			0.105***	0.03			0.089**	-0.044			0.060*	0.013			0.064*	-0.045
			<0.038>	<0.015>			<0.033>	<-0.022>			<0.031>	<0.007>			<0.033>	<-0.026>
			(2.999)	(1.072)			(2.347)	(-1.366)			(1.841)	(0.218)			(1.827)	(-0.617)
Human resource management score					0.078**	0.132***	0.041	0.155***					0.015	0.079	-0.013	0.108
					<0.027>	<0.065>	<0.014>	<0.077>					<0.006>	<0.041>	<-0.006>	<0.055>
					(2.135)	(4.525)	(1.040)	(4.604)					(0.388)	(1.232)	(-0.319)	(1.358)
lnK	0.178***	0.377***	0.178***	0.381***	0.178***	0.375***	0.178***	0.376***	0.098***	0.435***	0.097***	0.439***	0.097***	0.430***	0.097***	0.426***
	<0.311>	<0.450>	<0.311>	<0.456>	<0.312>	<0.448>	<0.311>	<0.449>	<0.140>	<0.505>	<0.139>	<0.509>	<0.139>	<0.498>	<0.139>	<0.494>
	(13.372)	(24.070)	(13.357)	(24.372)	(13.384)	(24.061)	(13.358)	(24.103)	(6.241)	(10.049)	(6.226)	(10.159)	(6.220)	(9.849)	(6.209)	(9.644)
lnL	1.597***	1.223***	1.601***	1.245***	1.603***	1.206***	1.597***	1.202***	0.901***	0.538***	0.899***	0.534***	0.905***	0.543***	0.900***	0.546***
	<2.204>	<1.817>	<2.209>	<1.849>	<2.213>	<1.791>	<2.204>	<1.785>	<0.749>	<0.387>	<0.748>	<0.384>	<0.753>	<0.391>	<0.749>	<0.393>
	(35.123)	(22.127)	(35.286)	(22.601)	(35.269)	(21.733)	(35.122)	(21.621)	(34.143)	(7.586)	(34.313)	(7.532)	(34.490)	(7.645)	(34.145)	(7.657)
Cons	-2.658***	-0.792***	-2.630***	-0.762***	-2.554***	-0.718***	-2.671***	-0.651***	1.291***	2.427***	1.284***	2.549***	1.370***	2.423***	1.303***	2.520***
	(-12.270)	(-3.409)	(-12.329)	(-3.233)	(-12.080)	(-3.113)	(-12.311)	(-2.763)	(7.791)	(5.341)	(8.246)	(5.503)	(8.465)	(5.580)	(7.853)	(5.447)
Manufacturing dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
The second survey dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1825	1909	1825	1909	1825	1909	1825	1909	890	213	890	213	890	213	890	213
Adj. R-Squared	0.708	0.664	0.708	0.662	0.707	0.666	0.708	0.666	0.763	0.785	0.763	0.784	0.762	0.786	0.763	0.785

Note 1. Standardised partial regression coefficients in angle brackets, t statistics in parentheses.

Note 2. Standardised partial regression coefficients are the coefficients found by the regression of standardised dependent variable on standardised explanatory ones. They are used in case we compare the relationship of the impact of explanatory variables on the dependent variable among different models.

Note 3. * p<0.10, ** p<0.05, and *** p<0.01.

Table 10-1 Estimation Results Examining Effects of Management Practices on Capital Efficiency

lnVA	Capital efficiency							
	Japan	Korea	Japan	Korea	Japan	Korea	Japan	Korea
lnK	0.110***	0.357***	0.123***	0.407***	0.148***	0.353***	0.109***	0.361***
	<0.174>	<0.420>	<0.195>	<0.479>	<0.234>	<0.416>	<0.173>	<0.425>
	(5.071)	(17.390)	(6.506)	(21.237)	(7.792)	(18.516)	(5.065)	(17.734)
lnK ×ln(AVG. score)	0.065***	0.054***						
	<0.145>	<0.121>						
	(4.473)	(5.323)						
lnK ×ln(ORG. score)			0.054***	0.020**			0.048***	-0.012
			<0.127>	<0.045>			<0.112>	<-0.026>
			(4.618)	(2.230)			(3.777)	(-1.133)
lnK ×ln(HRM. Score)					0.037***	0.056***	0.018	0.062***
					<0.081>	<0.136>	<0.039>	<0.149>
					(2.969)	(6.469)	(1.339)	(6.170)
lnL	0.885***	0.776***	0.886***	0.793***	0.893***	0.766***	0.883***	0.765***
	<1.648>	<1.348>	<1.649>	<1.378>	<1.662>	<1.331>	<1.645>	<1.329>
	(39.913)	(21.836)	(40.050)	(22.335)	(40.411)	(21.568)	(39.841)	(21.546)
constant	0.825***	1.279***	0.818***	1.086***	0.780***	1.361***	0.831***	1.359***
	(7.831)	(7.477)	(7.798)	(6.487)	(7.448)	(7.921)	(7.890)	(7.909)
Manufacturing dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
The second survey dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observation	2715	2122	2715	2122	2715	2122	2715	2122
Adj. R-Squared	0.707	0.68	0.707	0.676	0.706	0.682	0.707	0.682

Note 1. Standardised partial regression coefficients in angle brackets, t statistics in parentheses.

Note 2. Standardised partial regression coefficients are the coefficients found by the regression of standardised dependent variable on standardised explanatory ones. They are used in case we compare the relationship of the impact of explanatory variables on the dependent variable among different models.

Note 3. * p<0.10, ** p<0.05, and *** p<0.01.

Table 10-2 Estimation Results Examining Effects of Management Practices on Labor Efficiency

lnVA	Labor efficiency							
	Japan	Korea	Japan	Korea	Japan	Korea	Japan	Korea
lnK	0.193***	0.435***	0.193***	0.435***	0.193***	0.435***	0.193***	0.435***
	<0.306>	<0.512>	<0.307>	<0.512>	<0.306>	<0.512>	<0.306>	<0.513>
	(17.252)	(30.157)	(17.304)	(30.188)	(17.266)	(30.160)	(17.275)	(30.216)
lnL	0.959***	0.812***	0.906***	0.851***	0.967***	0.772***	0.954***	0.812***
	<1.786>	<1.410>	<1.687>	<1.478>	<1.801>	<1.341>	<1.777>	<1.411>
	(21.327)	(13.987)	(23.757)	(16.378)	(24.607)	(14.251)	(21.442)	(14.032)
lnL ×ln(AVG. score)	-0.039	-0.01						
	<-0.097>	<-0.020>						
	(-1.484)	(-0.308)						
lnL ×ln(ORG. score)			-0.003	-0.038			0.013	-0.061**
			<-0.008>	<-0.081>			<0.034>	<-0.131>
			(-0.150)	(-1.402)			(0.613)	(-1.962)
lnL ×ln(HRM. Score)					-0.046**	0.017	-0.051**	0.047
					<-0.111>	<0.035>	<-0.123>	<0.096>
					(-2.022)	(0.625)	(-2.107)	(1.508)
constant	0.690***	1.009***	0.729***	0.981***	0.685***	1.058***	0.695***	1.048***
	(6.423)	(5.842)	(6.858)	(5.837)	(6.449)	(6.084)	(6.467)	(6.030)
Manufacturing dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
The second survey dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	2715	2122	2715	2122	2715	2122	2715	2122
Adj. R-Squared	0.705	0.675	0.705	0.676	0.705	0.676	0.705	0.676

Note 1. Standardised partial regression coefficients in angle brackets, t statistics in parentheses.
Note 2. Standardised partial regression coefficients are the coefficients found by the regression of standardised dependent variable on standardised explanatory ones. They are used in case we compare the relationship of the impact of explanatory variables on the dependent variable among different models.
Note 3. * p<0.10, ** p<0.05, and *** p<0.01.

Table 11 Estimation Results Considering Effects of Management Scores on Firm Performances

lnVA (2009-2011)	Japan			
Average score (the 1st survey)	0.044			
	<0.015>			
	(1.478)			
Organizational management score		0.052**		0.057**
		<0.023>		<0.025>
		(2.259)		(2.289)
Human resource management score (the 1st survey)			0.009	-0.015
			<0.004>	<-0.006>
			(0.356)	(-0.519)
lnK	0.045***	0.045***	0.044***	0.045***
	<0.072>	<0.072>	<0.071>	<0.072>
	(4.920)	(4.956)	(4.882)	(4.953)
lnL	0.947***	0.946***	0.951***	0.947***
	<0.863>	<0.862>	<0.866>	<0.863>
	(59.420)	(59.805)	(59.913)	(59.459)
Cons	1.491***	1.468***	1.563***	1.487***
	(15.846)	(16.815)	(17.746)	(15.803)
Manufacturing dummy	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes
Number of observations	1443	1443	1443	1443
Adj. R-Squared	0.858	0.858	0.858	0.858

Note 1. Standardised partial regression coefficients in angle brackets, t statistics in parentheses.
Note 2. Standardised partial regression coefficients are the coefficients found by the regression of standardised dependent variable on standardised explanatory ones. They are used in case we compare the relationship of the impact of explanatory variables on the dependent variable among different models.
Note 3. * p<0.10, ** p<0.05, and *** p<0.01.

Figure 1 – 1 Distribution of Management Scores (All firms in the 1st survey)

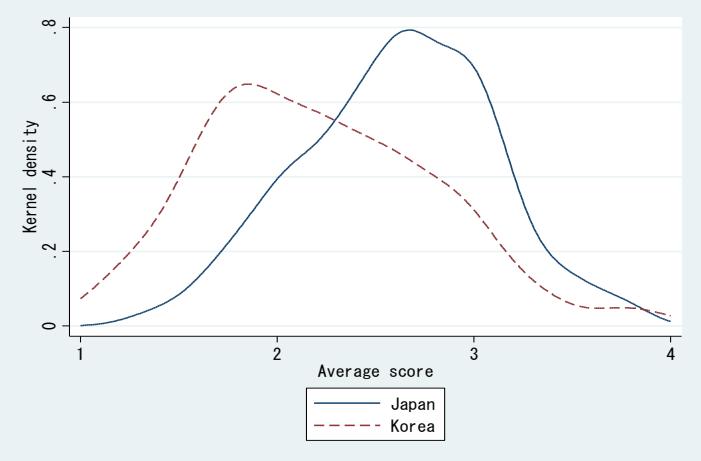


Figure 1 – 2 Distribution of Management Scores (All firms in the 2nd survey)

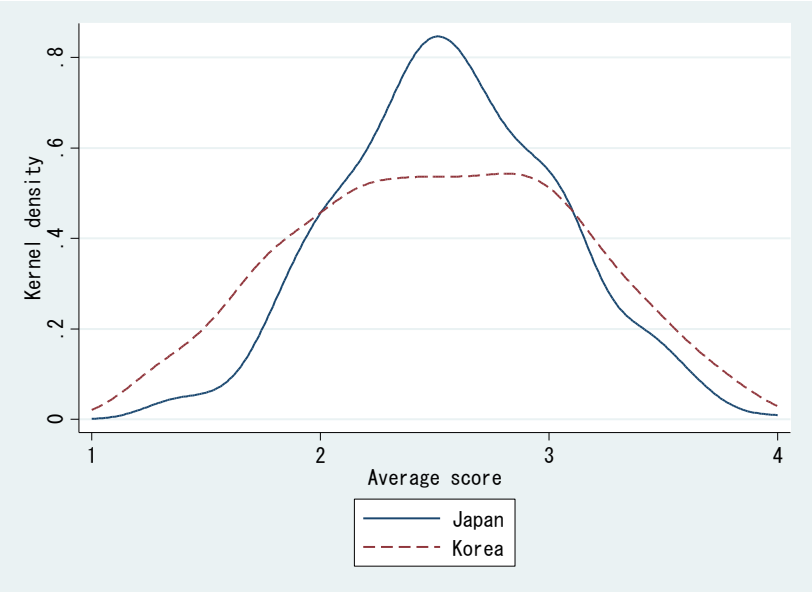


Figure 1 – 3 Distribution of Management Scores (1st vs 2nd in Japan)

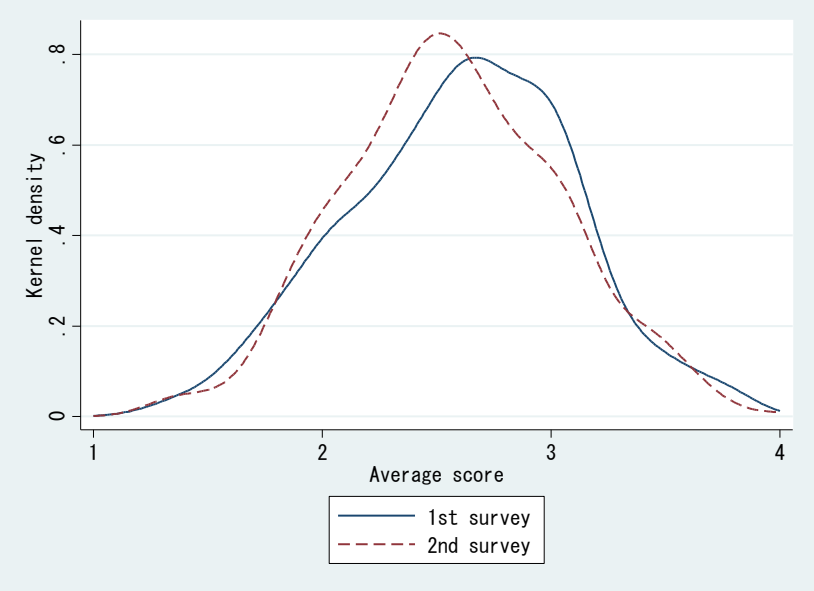


Figure 1 – 4 Distribution of Management Scores (1st vs 2nd in Korea)

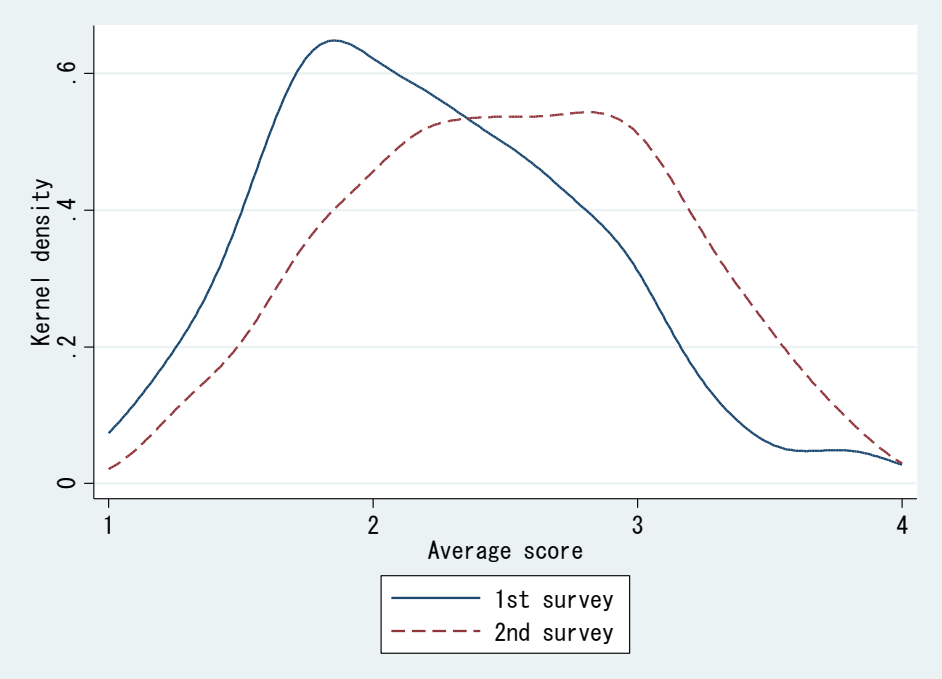


Figure 2 – 1 Distribution of Organizational Management Scores (1st vs 2nd in Japan)

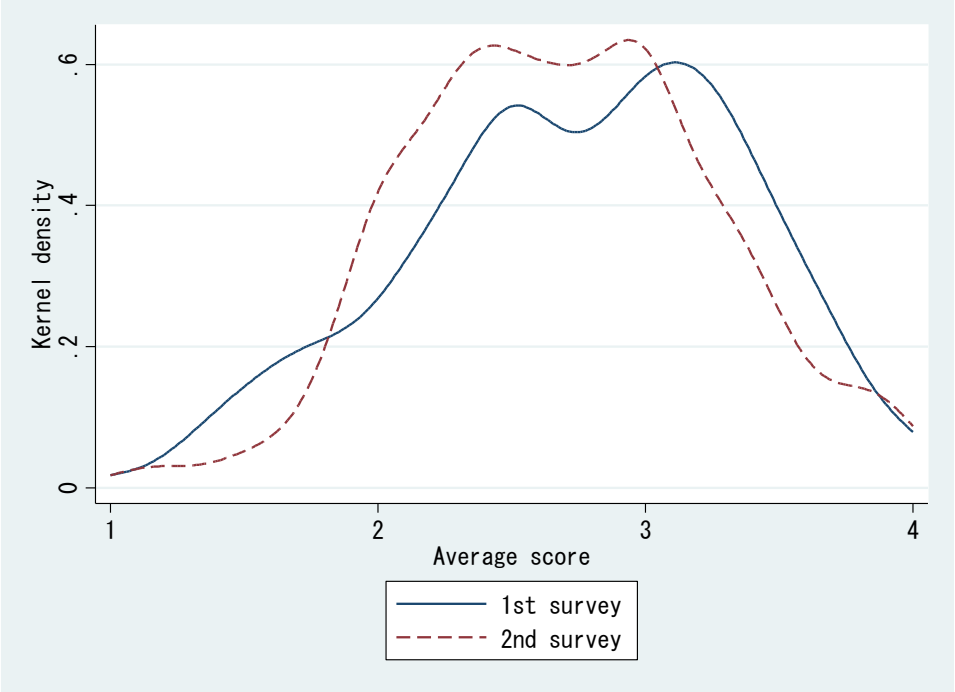


Figure 2 – 2 Distribution of Organizational Management Scores (1st vs 2nd in Korea)

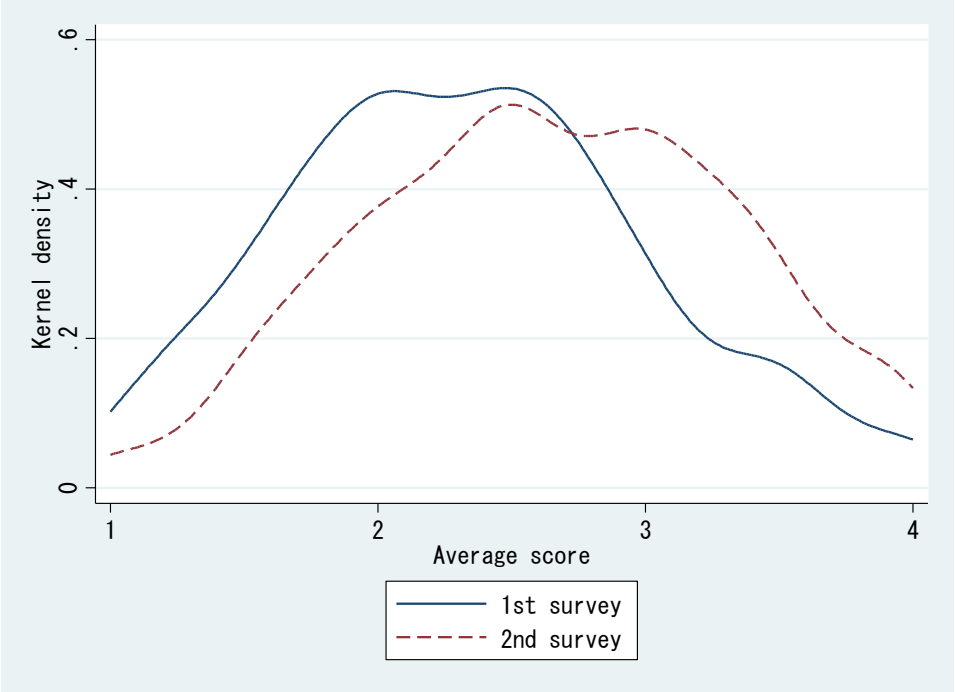


Figure 2 – 3 Distribution of Human Resource Management Scores (1st vs 2nd in Japan)

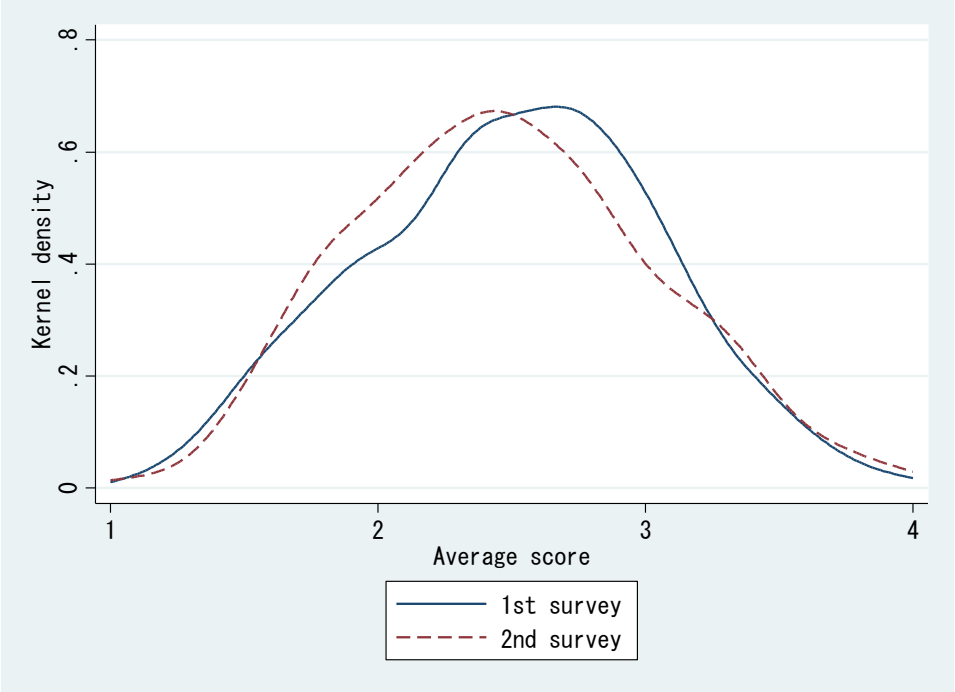


Figure 2 – 4 Distribution of Human Resource Management Scores (1st vs 2nd in Korea)

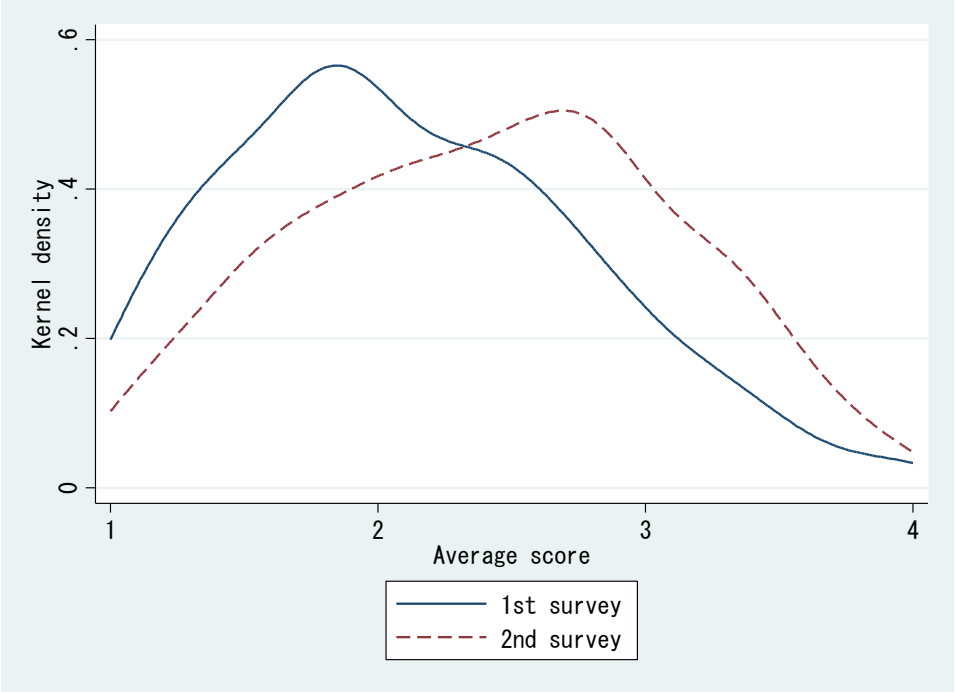


Figure 2-5 Distribution of Management Scores in Large Firms (1st vs 2nd in Japan)

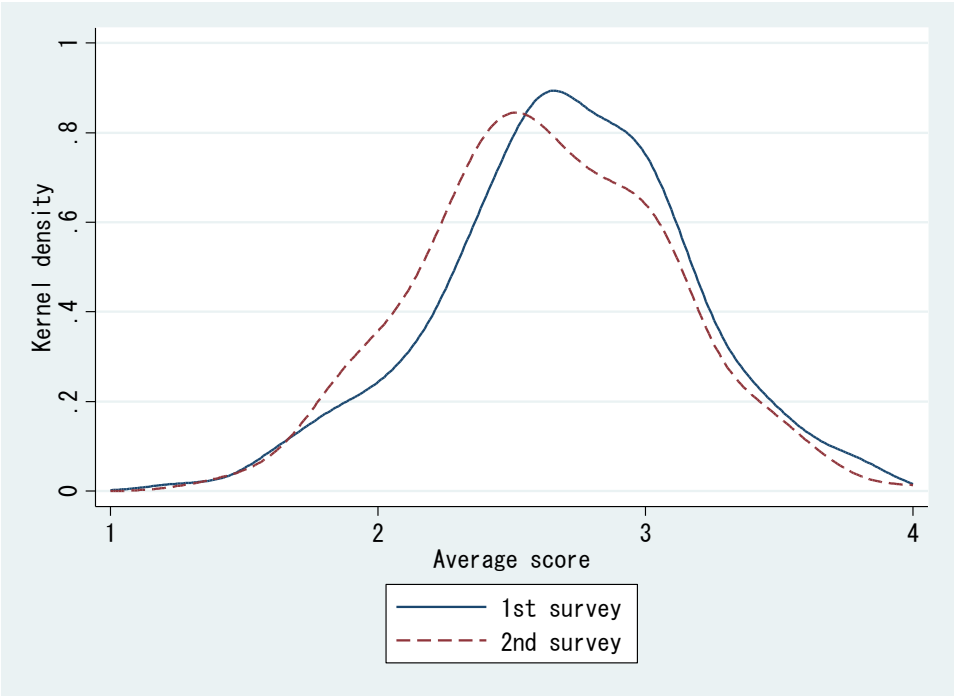


Figure 2-6 Distribution of Management Scores in Large Firms (1st vs 2nd in Korea)

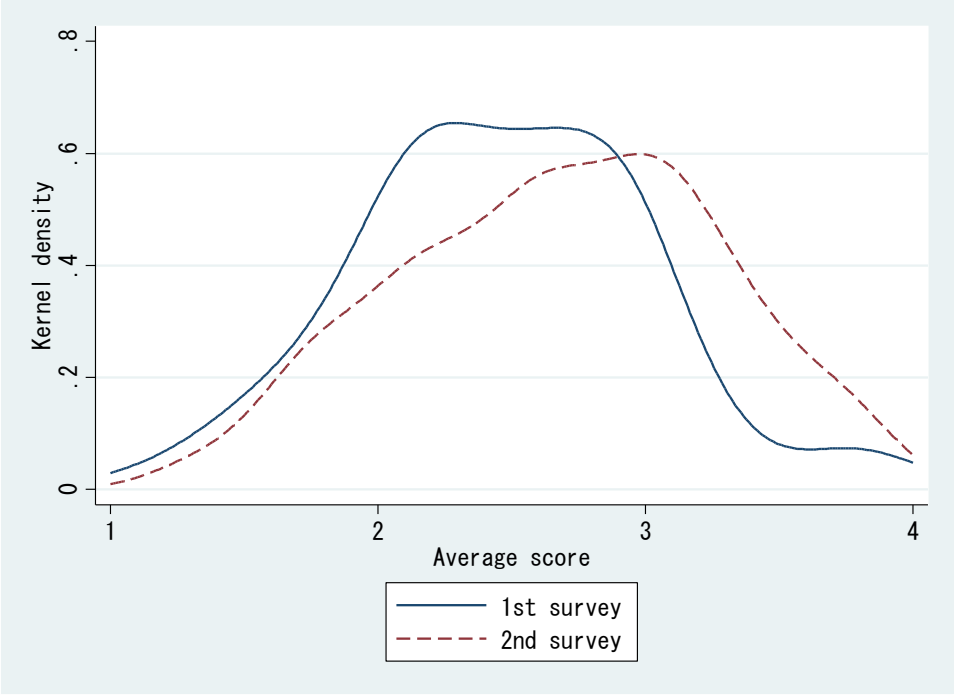


Figure 2-7 Distribution of Management Scores in SME (1st vs 2nd in Japan)

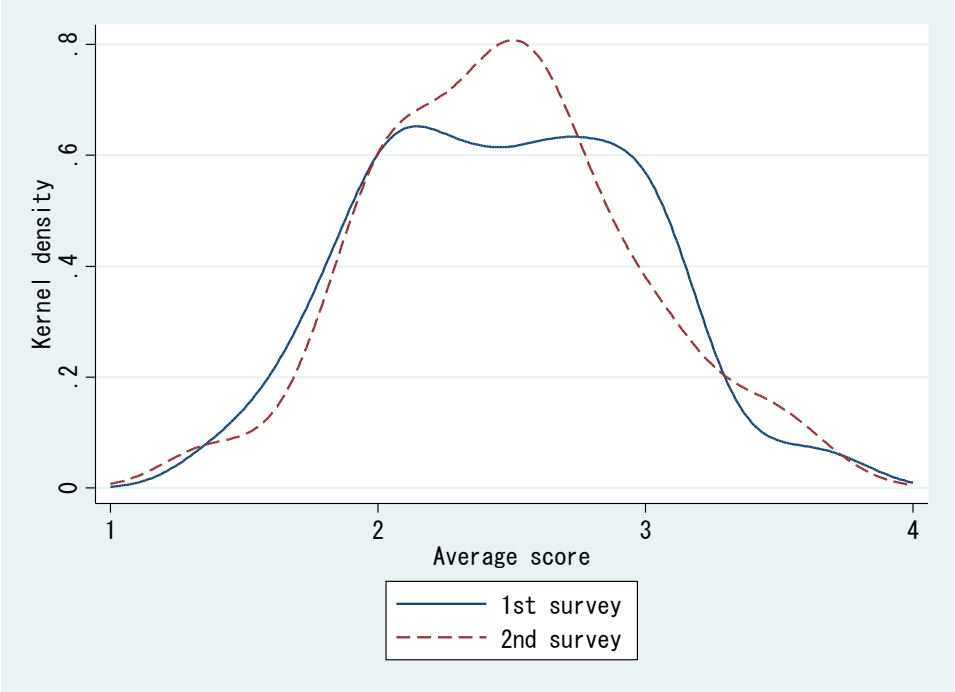
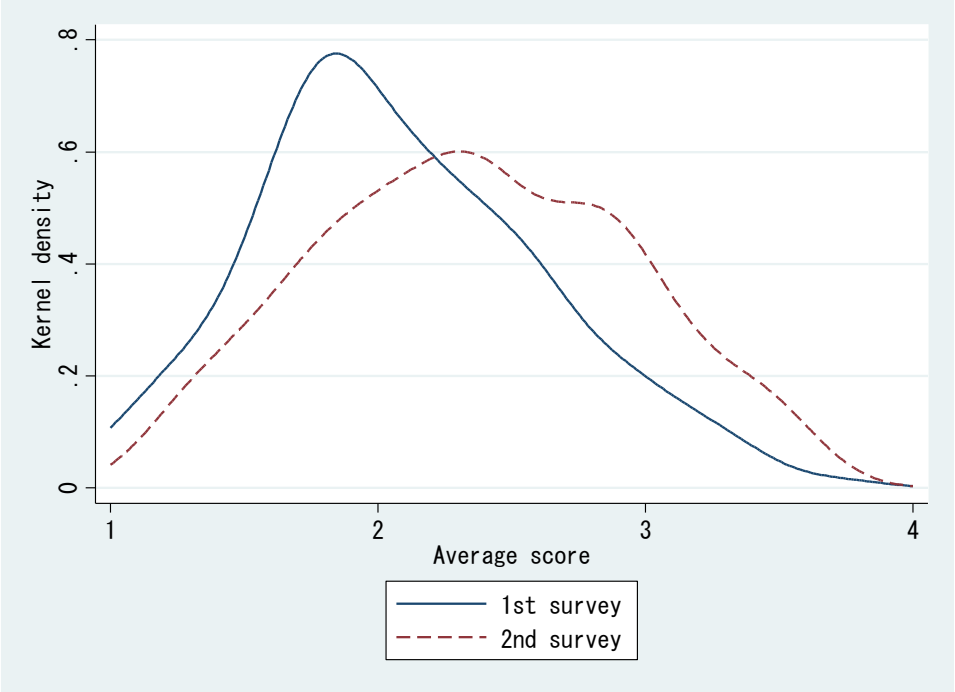


Figure 2-8 Distribution of Management Scores in SME (1st vs 2nd in Korea)



When Are Friendly Outside Directors Beneficial to Firms?

Sung Wook Joh and Jin-Young Jung

Preliminary Draft
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When are 'Friendly Outside Directors' Beneficial to Firms?

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Abstract

Using Korean firms between 1999 and 2006, we show that *friendly* outside directors with business, professional or social ties with a firm improve Tobin's Q when firms face M&A threats, distress, financial volatility, or stricter regulatory environments. *Independent* outside directors without such ties increase firm value in firms with low information transaction costs or high potential agency costs. Our analyses suggest that *friendly* outside directors can be better advisors or political liaisons while *independent* directors are better monitors, controlling for endogeneity issues and directors' expertise and social networks given the corporate environments and characteristics.

Key words: Board composition, Connected Outside Directors, Role of Outside Directors, Monitoring and Advising, Political Role

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I. Introduction

A friend in need is a friend indeed.

Quintus Ennius [Poet, 239-170 B.C.]

While researchers and policy makers have emphasized the importance of independence of outside directors, some outside directors have a business or professional tie with the firm or a social tie with the firm's insiders. As previous studies show[1], "*connected*" or "*friendly*" outside directors who lack the independence can be less effective in monitoring role. Then, do "*connected*" or "*friendly*" outside directors harm to firm and lower value?

Considering that outside directors are expected to play other roles in addition to a monitoring role, ex-ante effects of "*friendly*" outside directors can be ambiguous. With a better access to information on the firm through a business or social tie to the insiders, "*connected*" or "*friendly*" outside directors can be an effective advisor to the insiders. Furthermore, as trusted by management, connected outside directors can also act as a liaison dealing with governments or regulators better than independent ones. As connected outside directors can play other roles better even though they might not be an effective monitor, they can help firm improve performance when advising or political roles become important.

This study empirically investigates whether and when connected outside directors can be beneficial to their firm and improve firm value. Outside directors' traditional role of monitoring can be effective and beneficial to the firm when a firm faces large potential agency problems or when outsiders do not have to incur large information cost[2]. In this case, independent outside directors improve firm value while connected outside directors do not. On the other hand, when

[1] Some anecdotal evidence like the Enron scandals and the tendency of connected outside directors to award their CEOs higher compensation (Hwang and Kim, 2009) and their tendency to yield lower turnovers (Weisbach, 1988) controlling for firm performance indicate that connected outside directors do not monitor firm management well.

[2] Outside directors' monitoring depends on information environments (Raheja, 2005; Adams and Ferreira, 2007; Harris and Raviv, 2008, Duchin, Matsusaka, and Ozbas 2010). In firm information is transparent, independent outside directors improve firm value.

a firm is in need of outside directors who can act an advisor or boundary spanner, connected outsiders can be beneficial to the firm.

The importance of outside directors' advising roles increase when a firm is exposed to large financial volatility or external control threats.[3] Firms facing high uncertainty in their business would benefit more from outside directors' advice based on market or industry-related information than from monitoring when they make management decisions to exploit volatile corporate environments. External threats such as financial distress or takeover threats can discipline managers and improve firm value through substituting for or complementing internal monitoring (Jensen and Ruback, 1983, Cremer and Nair, 2005)[4]. Under these circumstances, the value of connected outside directors serving as advisors increases as firms need trusted advisors who have better understanding of the firm's true state while the benefit of independent outside directors' detached monitoring decreases. In fact, insiders are more forthcoming with a friendly board (Adams and Ferreira, 2007). Furthermore, Bange and Mazzeo (2004) show that target firms with boards dominated by independent outside directors receive smaller initial premiums in takeover bids, suggests that independence does not improve shareholder values in target firms facing takeover threats.

As the resource-dependence theory argues, firms can also use outside directors as a means to facilitate the acquisition of external resources such as government licenses, permits, and contracts or to deal with regulators (Pfeffer, 1972; Agrawal and Knoeber, 2001, Goldman, Rocholl, and So, 2013). External-boundary spanners often work in private and be a liaison while maintaining a close relationship with the management. Due to such attributes, connected outside directors would be a better fit to play a boundary spanner role than independent ones.

[3] We argue the benefit of outside directors' independence decreases for a target firm in takeovers. Note that independence of outside directors improves firm value when a firm is a bidder. Paul (2007) shows that firms are more likely to engage in corrective actions to bad acquisition bids when the firms are dominated by independent outside directors.

[4] Cremer and Nair (2005) show that strong outside control threats improve firm value when firms have a blockholder.

We hypothesize that the relative importance of independence or connectedness hinges upon the interaction of their role and firm characteristics and environment. Outside directors play multiple roles - monitor, advisor and boundary spanner. As they can monitor firm management better than friendly outside directors, independent outside directors' monitoring yields greater impact when there is more financial slack and when there is less information transaction cost. With better ties with insiders however, connected outside directors are likely to have greater access to the true state of the firm and they can be a better advisor and improve firm value when firms face outside control threats or large uncertainty. In addition, through connections and ties to the insiders, connected outside directors are more likely to be a trusted liaison to deal with regulators than independent outside directors when firms are subject to government regulations. These effects would be robust even after controlling for the expertise and outside network of outside directors[5].

We empirically examine the hypothesis that connected outside directors can improve firm value when firms are in need of advisors or boundary spanners. We test the effects of connected versus independent outside directors on firm value, and how their effects differ across four aspects of corporate environments including: 1) information environments, 2) agency costs, 3) corporate control and uncertainty, and 4) a regulatory environment requiring boundary spanners between a firm and outside institutions.

We focus on listed, non-financial firms in Korea from 1999 to 2006. In 1999, the South Korean government required that firms appoint outside directors.[6] During this time period, Korean firms have experienced corporate restructuring and governance reform following the

[5] A recent survey on 340 firms listed on the Korea Stock Exchange indicates that firms consider how directors interact with insiders and outside institutions in selecting board members (Korea Economics, September 28th, 2011).

[6] Starting from 1999, publicly-listed firms in Korea were legally required to appoint at least one outside director. For publicly-listed firms with over two trillion won in assets, outside directors had to constitute more than 50% of its board members beginning in January 2001. (See Black and Kim (2012))

Asian economic crisis in 1997. As an emerging market, the Korean economy also had more information asymmetry problems compared to developed countries (Francis, Hasan, Lothian, and Sun, 2010). As the Korean government strongly influences the regulatory environment, politically connected managers or directors might lobby key government officials whose decisions impact firm performance (Siegel, 2007). Taken together, these volatile economic circumstances and valuable social/political connections in the Korean economy provide a unique opportunity to examine whether the importance of friendly or independent directors differ across corporate environments.

For all publicly traded firms over from 1999 to 2006, we use very detailed information on directors and identify connected outside directors not only through business and professional ties but also through social ties, overcoming limitation in identifying independence in many studies on board compositions. We define "connected" or "friendly" outside directors as those who have current or past business connections with the firm or social ties with the chief executive officer (CEO) or the controlling shareholders. We consider a director as connected to the insiders of a given firm when he graduated from the same high school, or the same major at the same college/university, a criteria also used by Hwang and Kim (2009).[7]

Firm value is measured by Tobin's Q. Though it may suffer from problems associated with stock market valuations, Tobin's Q still reflects an investors' valuation of the firm and is affected less from earnings management problems associated with operating profitability. As non-financial firms in Korea rarely offer profit-sharing through stock options or stock grants (Cin, Han, and Smith, 2003), our Tobin's Q, based on firm value after deducting management compensation, is closely related to shareholders' payoff (Joh and Jung, 2012).

In our analysis, we deal with the endogeneity issue in board of directors and firm values. As many previous researchers point out (Hermalin and Weisbach, 1998; Chhaochharia and

[7] Hwang and Kim (2009) examined the effects of friendly connected boards on CEO compensation.

Grinstein, 2007), there is reverse causality problem that firm value affects the composition of board of directors. Addressing endogeneity issues in the board composition of independent and connected outside directors, we adopt the two stage linear squares method throughout the analysis. In addition, we also deal with the issue that different effects of independent and connected outside directors might stem from different levels of their expertise in related industries, or those of their bargaining power with the outside institutions. We control for the directors' expertise and their social networking which can affect firm value.

Using more fine-grained detail on directors than in previous studies, our main findings show that the value of independence or connectedness of outside directors depends on corporate environments and the role they are playing. When information is transparent, firms with higher ratios of independent outside directors increase firm value. Meanwhile, firms with higher connected outside directors do not benefit from information transparency. In contrast to connected outside directors, independent outside directors are more valuable in firms facing greater potential agency problems. On the other hand, connected outside directors improve corporate value in firms vulnerable to outside threats (such as M&A threats or financial distress) or in firms with high stock return volatilities and uncertainties (sales volatility). When external threats exist or when uncertainty is large, firms benefit more from connected outside directors' advising than independent directors' monitoring. Connected outside directors also have a larger positive impact on firms that are subject to government regulation. In short, our study suggests that boards with more independent directors increase firm value when their firms need a strong monitor. In contrast, boards with friendly directors can add firm value when firms need advisors or boundary spanners.

Our study contributes to the existing studies on the relationship between board composition and firm performance. We note that outside directors play an advisor or a political role while finance literature has traditionally focused on their monitoring role. Our study shows that board

independence by itself does not necessarily improve firm value. Friendly board does not necessarily harm firm value either. We show that the value of board independence or connectedness depends on the interaction between the role of directors and corporate environments. The value of independent outside directors is positive when they play monitoring role and information is transparent or agency problems are large. The value of connected outside directors is positive when they play an advisor or a boundary spanner role and the firm faces uncertainty or regulatory intervention.

Our study explains conflicting effects of independent outside directors on firm value in previous studies despite the common belief that they improve firm value. Our study can provide an explanation on why (independent) outside directors do not necessarily improve firm value in the US.[8] Different needs for different roles of outside directors as corporate environments change might explain why independent outside directors improve firm value in large firms but not in small firms in the US (Chhaochharia and Grinstein, 2007)[9]. The value of independent outside directors or that of connected outside directors vary with the changes in interactions between corporate environments and roles of directors.

The rest of the paper is organized as follows: In Section 2, we present a literature review, and develop our hypotheses. We describe our data and the sample in Section 3. In Section 4, we test our hypotheses regarding the valuation effect of board independence/friendliness. We provide concluding remarks in Section 5.

II. Previous Literature and Hypotheses

[8] Firms with more outside directors who are independent and do not have business or professional ties to the firm show lower firm performance (Agrawal and Knoeber, 1996; Bhagat and Black, 2002; Yermack, 1996).

[9] Using an event study, Chhaochharia and Grinstein (2007) show negative stock returns of small firms when they announced independent outside directors as part of governance requirements in 2002.

A. Roles of Outside Directors

A board of directors performs multiple roles in modern corporations: monitor, advisor and boundary spanner (Johnson et al., 1996). As a fiduciary representing and protecting (minority) shareholders' interests, directors monitor managers who may pursue their own interests (Jensen and Meckling, 1976). As an advisor, a board of directors can also offer counsel to top managers to help them make better decisions. Playing a political role, board members can link firms with external organizations to deal with regulators or to get external resources (Agrawal and Knoeber, 2001).

Monitor Role

Board independence is crucial to effective monitoring of management in countries with weaker governance system or in emerging markets (Daily and Dalton, 1994; Choi, Park, and Yoo, 2007, Yeh and Woidtke, 2005). Friendly boards award their CEOs higher compensation controlling for firm performance (Hwang and Kim (2009) or directors influenced by CEOs do not force turnovers for poorly performing CEOs (Weisbach, 1988, CDN, 2014),[10] suggesting that board members with business or social ties to the insiders do not adequately monitor firm managers.

Directors' monitoring becomes more important when firms face potential agency problems. In firms with large free cash flows or low ownership concentration by the largest shareholder or insiders, managers tend to pursue private interest at the outside shareholders' expense (Jensen, 1986; Jensen and Meckling, 1976). In such firms, effective board monitoring can reduce managers' value destroying activities. Since independent directors are more effective as monitor, firm value would increase with more independent directors.

However, board independence itself does not guarantee effective monitoring or greater firm value. As outside directors are less informed of firm goals and activities than insiders

[10] Even if free from business ties to the firm, directors who are appointed (co-opted) after the CEO assumes office do not monitor the CEO who help their appointment (CDN 2014).

(Raheja, 2005; Adams and Ferreira, 2007), independent outside directors' monitoring might not be effective when they do not have access to firm specific information. According to Chhaochharia and Grinstein (2007), stock returns are higher for large firms than small firms when appointing independent outside directors. As large firms' information is more easily accessible to outsiders, their work suggests that board monitoring is more effective when outsider directors have access to firm specific information. Confirming this conjecture, Duchin, Matsusaka, and Ozbas (2010) show that outside directors' monitoring becomes effective only when information is transparent so that outside directors can they might not have material information on the firm without paying high transaction costs.

Advisor role

Outside directors can serve as advisors in addition to monitoring firm managers. While demand for advising increases as corporate complexity increases due to firm size and leverage (Coles, Daniel, and Naveen (2008)), the supply for advising depends on the number of outside directors and their interactions with the insiders. Coles, Daniel, and Naveen (2008) argue that advising quantity increases as the number of outside directors increases. Advising quantity is also increases with outside directors' ties to insiders. Based on a survey of CEOs and outside directors, Westphal (1999) shows friendly boards with social ties to CEOs increase the frequency of advice.

The effectiveness of board advice would depend on directors' capability and their interaction with the insiders. Studies have shown that outside directors' experience and expertise are important determinant for advice quality. Firms that face large uncertainty or large information gap can get advice from directors with more information on their industry or related industries (Dass et al. 2014). Outside directors who have access to organization-specific knowledge about their firm, understand their firm's key corporate strategic issues, and have better relationships with their firm's top managers can give better, more effective advice (Johnson, Daily, and Elistrand, 1996; Coles, Daniel, and Naveen, 2008; Judge and Dobbins,

1995, Westphal 1999, Kang, Kim and Lu (2012)). These studies suggest that given the same qualifications of outside directors, advice of connected outside directors with a tie to the firm and the insiders can be more effective than that of independent outside directors.

Outside directors' advisory role outweighs their monitoring role when strong external threats such as financial distress or takeover threats discipline managers and substitute for internal monitoring or complementing internal monitoring (Jensen and Ruback, 1983, Cremer and Nair, 2005)[11]. When external threats are realized, corporate control is transferred from incumbent insiders to new shareholders (due to M&A threats) or creditors (due to financial distress). Facing a threat, incumbent managers have incentive to exert more effort not to lose their jobs by improving firm value to prevent the firm from being taken-over or falling into bankruptcy. Therefore, outside directors' internal monitoring often adds little value with the presence of strong external monitoring.[12] While external threats generate high information asymmetry between insiders and outsiders (Hoshi, Kashyap and Scharfstein, 1990), outside directors may have difficulty acquiring insider information. Instead, firms may benefit more from friendly directors' advising when negotiating for external financing, or when dealing with takeover threats. Friendly boards can improve shareholder values in target firms facing takeover threats. Bange and Mazzeo (2004) show that target firms in takeovers receive smaller initial premiums when independent outside directors dominate boards controlling for types of takeover bids, using 436 takeover threats in the US between 1979 and 1990.[13] In short, the quantity and effectiveness of outside directors' advising depends on board characteristics and corporate-specific conditions.

Political Role

[11] Cremer and Nair (2005) show that strong outside control threats improve firm value when firms have a blockholder.

[12] Conversely, Brickley, Coles and Terry (2008) show that when takeover threats are drastically reduced, outside directors' monitoring becomes important. Upon the announcement of poison pills (which makes takeovers difficult), firms with more outside directors show higher returns than fewer outside directors.

[13] In contrast, Cotter, Shivdasani and Zenner (1997) using 169 tender offers between 1989 and 1992 show that independent boards can increase the shareholder values of target firms in takeovers.

Lastly, directors who have experience at governments or political parties or those who have social networks with outside institutions can play a political role and help link their firm to the external environment.[14] For example, outside directors can facilitate the acquisition of government licenses, permits, and contracts or dealing with regulators (Zald, 1969; Pfeffer, 1972; Agrawal and Knoeber, 2001, Goldman, Rocholl, and So, 2013). As such role is carried out by a liaison who firm management can trust, a firm is more likely to seek connected outside directors rather than independent directors to serve as boundary spanners.

Industry-specific characteristics and political and regulatory environments affect the importance of such boundary spanners. Directors' boundary spanner role is especially useful when a firm faces substantial government regulations, applies for public sector procurements or needs to obtain government-regulated license or permit. In this case, a firm can benefit from outside directors who can influence regulators and play a boundary spanner role.

B. Hypotheses

We specify hypotheses on how interactions between board independence (or connectedness) and corporate environments affect firm value. Effects of the interactions on firm performance imply different corporate needs for different roles of directors when firm characteristics and corporate environments change. The previous section suggests that independent outside directors would better serve as a monitor while connected outside directors would better act as an advisor or a boundary spanner. We go beyond this typical dichotomy and argue that different corporate environments ensure different role of directors.

First, we address the problem of endogeneity issues in corporate boards before we proceed the analysis. Corporate environments might influence board composition and board independence (Hermalin and Weisbach, 1998). CEOs with large social network can increase

[14] As the resource-dependence theory argues, boundary spanners can help their firm acquire external resources, build the firm's organizational legitimacy, or transfer firm information to capital markets (Pfeffer, 1972; Forbes and Milliken, 1999; Cohen, Frazzini and Malloy, 2010).

the availability of qualified people for firms to appoint as outside directors (Shivdasani and Yermack, 1999; Fich, 2005; Kirchmaier and Kollo, 2006). Firms with high information asymmetry would find it difficult and costly to transfer firm-specific information to outsiders. When they have to incur high monitoring costs, outside directors often provide less and poor monitoring. With high information transaction costs, firms invite fewer independent directors and solicit less monitoring from their directors (Linck, Netter, and Yang, 2008). In our analysis, we run two-stage least squares regressions (2SLS) using the scope of CEO's social network[15] as instrument variable (IV) affecting the ratio of independent outside directors over total board or that of connected outside directors in the first stage (See Section IV for more discussion).

Second, we hypothesize that firms with better information environments benefit more from independent outside directors. As discussed in the previous section, board monitoring efficacy increases with independent outside directors and corporate information environments. In better information environments, independent outside directors can incur less costs of information gathering and processing. Information environments are measured by degrees of information asymmetry, transparency in management, and information transaction costs.

Third, we examine whether firms benefit more from independent outside directors when facing greater managerial slack due to large free cash flows (Jensen 1986) or when insiders' or largest shareholders' incentive diverges from that of minority shareholders' due to low ownership (Jensen and Meckling 1976). The effects of independent outside directors on firm value are expected to be higher when a firm has large free cash flows, or when controlling shareholders or insiders have low ownership.

Fourth, we investigate whether firms benefit more from connected outside directors who perform a better advisory role than independent directors when firms face large uncertainty or firms are vulnerable to outside control threats. Firm managers are likely to exert efforts even

[15] We checked the validity of IV (highly-networked CEO dummy) using the Pearson product moment correlation coefficient and multiple regression analysis and we found out the highly-networked CEO dummy is not significantly correlated to the Tobin's Q.

without internal monitoring when they face potential M&A threats in the near future, financial distress, or when they are standalone firms without affiliated firms. The value of connected outside directors' advising increases when firms face uncertainty or strong external control threats as the corporate demand for advising increases. Outside directors give better advice when they have greater advising capability stemming from their social capital or their market or industry- related information. Given an advising capability, with better access to relevant information about the firm and management than independent directors, connected outside directors would be more effective advisor than independent ones.

Finally, we examine whether connected outside directors can perform a better boundary spanner role than independent directors. Compared with independent directors, connected outside directors can serve as boundary spanners who would be working as a liaison trusted by the firm's top management. Corporate need for outside directors who can act as boundary spanners depends on the frequency of dealing with regulators. In comparison with firms with business activities abroad, firms operating in domestic markets only are more likely to rely board directors for boundary spanner role to deal with domestic governments. Korean firms do not seem to rely on foreign outside directors as a liaison to deal with foreign governments or foreign regulators. Among top managers, a mere 0.65 percent are foreign nationals in 2011 (Korea Listed Companies Association, 2012).[16]

In addition, firms that need boundary spanners are likely to spend corporate resources on lobbying activities. Connected outside directors in firms with high lobbying expenses are more likely act as a liaison than independent outside directors. In short, a boundary spanner role is expected to be more useful for a firm that operates exclusively in domestic markets or engages in large lobbying activities. In this case, firm value will increase with more connected outside

[16] It would be costly to appoint outside directors who play a boundary spanner with specific information of diverse foreign regulators or with connections with diverse foreign governments. In addition, the frequency to deal with foreign governments or regulatory authorities would be relatively small except for very large firms. Instead of internalizing liaison person by hiring foreign outside directors or outside directors with experience with foreign governments as outside directors, firms might rely on external organizations such as law firms, lobbying firms or domestic governments to deal with foreign authorities.

directors.

III. Sample Selection and Data

A. Data

Our data come from several sources. We hand-collected information on board composition and board characteristics of non-financial firms listed on the Korea Stock Exchange (KSE) between 1999 and 2006. Note that in 1999, the Korean government required that all publicly traded firms appoint at least one outside director. We include information on age, educational credentials (such as high school, college, and major), previous careers, and family ties to controlling shareholders, using the TS2000 database provided by Korea Listed Companies Association, KISINFO provided by Korea Information Service, Inc., and the Who's Who databases of four daily newspapers.[17]

We obtain annual financial data and monthly stock returns from the FnDataguide. In addition, we collect data on the relevant firms' fair disclosures from the electronic disclosure system (www.dart.fss.or.kr) to analyze the characteristics of firms with friendly directors. We also use disclosures on major changes in investment or business activities between 1995 and 2011.

Our final data set includes complete information on the top managers during 3,836 firm-years. These managers represent 578 unique firms from 1999 through 2006. In the final data set, there are 21,120 directors; 16,178 executive directors (including CEOs) and 4,942 outside (non-executive) directors. Most boards are appointed during the shareholders' annual meeting, which is usually held in the first quarter of each year; hence, boards are largely responsible for a firm's performance in the year in which they were appointed.

B. Variables

[17] These newspapers are Chosunilbo, Dongailbo, JoongAngilbo, and Munhwailbo.

B.1. Board Independence

Using information on directors from various sources, we sharpen the definition of board independence in greater detail. First, as outlined in other studies, we define independent outside directors as those who have not engaged in business or professional activities associated with that firm and who are neither past nor current employees of the firm or its affiliated firms (Weisbach, 1988; Choi, Park and Yoo, 2007). Second, independent directors have not worked at the same firm or institute with the CEO or controlling shareholder of a given firm in the past.[18] Third, independent directors do not have personal ties with the CEO or controlling shareholder of a given firm (e.g. graduating from the same high school, or the same major at the same college/university), a criteria also used by Hwang and Kim (2009). If an outside director does not meet any of these three criteria, then the director is classified as friendly.

After classifying each director as friendly or independent, we construct proxy variables for the degree of board independence and friendliness using the number of independent and connected outside directors divided by the total number of board members. Note that the sum of board independence and friendliness is less than one due to the existence of executive directors.

Figure 1 presents how board composition has changed from 1999 through 2006 using a sample of 3,836 firm-years. The left-side of the figure indicates that the ratio of outside directors (the sum of *Independent Outside Directors* and *Connected Outside Directors*) was only about 12% in 1999. In 1999, the Korean government mandated that all listed firms must have at least one outside director. Starting in 2001, all financial institutions and large firms with assets greater than 2 billion dollars must have boards constituted by at least 50% of outside independent directors, and small firms are required to appoint at least one outside director. After these laws were enacted, the proportion of outside directors in Korean firms sharply

[18] Korean firms do not appoint managers from a firm operating in the same industry to avoid potential collusion issues. Directors with managerial experiences often had experience in affiliated firms that belong to the same business groups.

increased to 37% in 2006.

For our entire sample period, on average 17.8% of all directors were independent outside directors and 9.1% were connected outside directors (Table 1); about one-third[19] of outside directors had business or social ties with their firm's CEO or controlling shareholder. Figure 1 shows that both friendly and independent directors increased over time and that the ratio of connected directors over outside directors (the right-side) was nearly constant in recent years.

[insert Figure 1 around here]

B.2. Firm Value

Following earlier studies on corporate governance and performance, as far back as to Morck, Shleifer, and Vishny (1988), we use Tobin's Q as a proxy for firm value. Tobin's Q is the ratio of a firm's market value to the replacement cost of that firm's assets. We observe that the mean value of Tobin's Q is 0.933 (Table 1). While the ratio may suffer when stock prices are over-valued or have high volatility, Tobin's Q still reflects market participants' valuations of a given firm. In addition, using Tobin's Q, we avoid problems associated with earnings management that can occur when profitability is used as a proxy for firm value.

B.3. Corporate Environments: Information, Potential Agency Problems, External Threats, Business Volatility, and Government Regulation

Corporate information environments are assessed by several measurements and variables. One set of measures is based upon bid-ask spread in stock prices, which reflect information transaction costs as developed in the market microstructure models of Glosten-Harris (1988) (hereafter GH model), Hasbrouck (1991), and Foster and Viswanathan (1993) (hereafter HFV model)[20]. A firm with high information costs based on GH or HFV models has a high degree

[19] According to Hwang and Kim (2009), 41.6% of outside directors are friendly directors in US firms, a little bit higher than that of Korean firms over the period 1996-2005.

[20] Market microstructure proxies of information asymmetry capture the idea that the presence of better-informed traders in a financial market may affect the market's process of price formation. According to market

of information asymmetry risk.[21] *GH(HFV)* is an indicator variable which equals zero if information costs in GH(HFV) model are in the bottom third of its distribution, one if information costs are in the medium third of its distribution, or two otherwise.

We also use *firm size*, *analyst report*, *credit rating*, and *transparency index* as proxy variables for information costs.[22] Directors can acquire and process information available in capital markets. Capital markets review and monitor large firms or firms with credit ratings more often than otherwise (Hou, 2007). *Firm size* is measured through the log value of total assets. *Analyst report* is the total number of analyst reports about the firm in a given year. *Credit rating dummy* is 1 for companies with credit ratings for commercial papers (CPs) or corporate bonds (CBs), and 0 otherwise. *Transparency* is the natural logarithm of the sum of transparency-related scores on the Korea Corporate Governance Index (KCGI) between 2002 and 2006[23] (e.g., the number of meetings related to investor relations; disclosure on earnings forecast, boards, and financial statement).

Monitoring yields more benefit when a firm has large free cash flows or insiders' low ownership which can cause incentive and agency problems. *Free cash flows* refer to a firm's operating cash flow after subtracting capital expenditures. It is normalized by assets. *Largest ownership* (*Inside ownership)* is the ownership of the largest shareholder who owns at least 5% (insiders including CEO, executive managers, and inside auditors).

Firms can benefit more from the advisory role of outside directors when the firms face large uncertainty or outside control threats. Uncertainty is measured through financial volatility.

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microstructure literature, market makers widen the bid-ask spread to compensate for their loss from trading with informed traders (Glosten and Milgrom (1985)). Using information on price, quote, and spread, Glosten and Harris (1988) empirically divide the bid-ask spread into permanent components related to information asymmetry cost and temporary components related with order processing cost, inventory cost, etc. Hasbrouck (1991) and Foster and Viswanathan (1993) consider the effects over time.

[21] We appreciate generosity of Chae, Jung, and Yang for providing us annual GH and HFV variables based on annual averages for the daily Trade and Quote (TAQ) variables between 1999 and 2006.

[22] According to our data, information transaction cost variables, GH or HFV, are closely related to traditional variables representing information asymmetry risks. We find that firms with a high GH or HFV measure are smaller in size, have fewer analyst reports, have a low or non-credit rating, and have low transparency. This information is not reported due to space limitations but is available upon request.

[23] As maximum scores vary each year, we normalize each firm's transparency scores by annual average of total score.

Stock return volatility, the annualized standard deviation of daily returns during the year, and *Sales volatility,* the standard deviation of sales from year t-4 to year t. External control threats are identified when firms face potential M&A threats in the near future, financial distress, or when they are standalone firms without affiliated firms. *M&A threat* is a dummy taking 1 if a firm has ever been a target for M&A over the previous or the following three years[24], and 0 otherwise. *Standalone dummy* is 1 if a firm does not belong to one of the 50 largest business groups (*chaebols*) according to the classification of Korea Fair Trade Commission. Chaebol-affiliated firms are better protected from outside threats as they are connected through interlocking ownership among affiliates. *Distressed* is a dummy that is 1 when a firm has experienced an equity loss in the given year or ordinary income losses in three consecutive years (Hoshi, Kashyap, and Scharfstein, 1990).

Outside directors' boundary spanning roles are closely correlated with corporate lobbying activities measured through whether firms are more subject to domestic government regulations or the magnitude of expenses firms spend to deal with outsiders. *Domestic firm dummy* is 1 for firms when 100% of the revenue comes from domestic markets and zero otherwise. It is 1 for 40.3% observations in our data. *Entertainment expenses/sales* is the entertainment expenses ratio normalized with the sales. Korean tax laws allow firms to deduct gifts, donations, and entertainments for outsiders as entertainment expenses up to certain percent of sales. This expense is not directly related or associated with business activities. The average *Entertainment expenses/Sales* ratio is 0.3% for our data. This ratio is higher in firms under distress, in small firms, and in firms that do business exclusively in the domestic market. Also, the expenses are high in industries which are sensitive to government regulations such as biotechnology and pharmaceutical industries or in industries which is subject to public sector budget spending such as construction industry.

Table 1 presents descriptive statistics regarding key firm characteristics and board

[24] It includes cases where M&A announcement was made but the deal failed to go through. M&A events are obtained from the Securities Data Company's (SDC) M&As database compiled by Thomson Financial.

information. *Highly-networked CEO* is a proxy for the CEO's social networking potential. It equals one if the CEO has ever held a political or government position, worked as a journalist, been a CEO at a bank, or has been a chairman or a vice chairman of some association. 11.4% of the total CEOs in our study fit this profile.

[insert Table 1 around here]

[insert Table 2 around here]

IV. Empirical Design and Results

We examine the effects of board independence and friendliness on firm value. After addressing endogeneity issues, we test whether the effects vary as corporate environments and situations change. Specifically, four types of corporate environmental variables are examined: information asymmetry, agency costs, vulnerable corporate control, and regulatory intervention.

A: Board Independence/Connectedness and Corporate Events

In Table 3, we compare the characteristics of firms with many friendly directors to those of firms with no friendly directors. We select the 63 companies ("firms with friendly directors") that have the highest ratio of friendly directors throughout the sample period and the 63 companies ("firms without friendly directors") that have never had a friendly director. There was no significant difference on firm size between two groups. On the other hand, firms with friendly directors have more often experienced major corporate control related events such as changes in largest shareholders, block trading, establishments of subsidiaries, affiliated firms, spin-offs, and mergers between 1995 and 2011. Additionally, they have a greater number of major changes in business activities such as overseas expansion, commodities development, and large business transactions than firms without connected outside directors.

[insert Table 3 around here]

B: Endogeneity Issues

In our analyses, we address endogeneity problems associated with board composition. Board composition can be determined by firm performance and firm characteristics (Hermalin and Weisbach, 1998, Bhagat and Black, 2002). The ratio of independent outside directors over total directors depends on information acquisition and processing costs (Linck, Netter, and Yang; 2008).

To account for the endogeneity problems between board independence (or friendliness) and firm value, we estimate the system of equations by two-stage least squares (2SLS) in equation (1).

1st Stage Regression: I_{ijt}(*or* F_{ijt})= α_0 + α_1 *Tobin's Q* + α_2 *Highly-networked CEO*+ *control variables*+ε (1)

2nd Stage Regression: *Tobin's Q*= β_0 + β_1 *Predicted I* + β_2 *Predicted F* +*control variables*+ε (2)

In the first stage regressions, we estimate the board independence/connectedness (I_{ijt} and F_{ijt}) as an endogenous variable in a separate equation. We regress I_{ijt} and F_{ijt} separately on firm performance, other regressors and *Highly-networked CEO dummy* as instrument variable. *Highly-networked CEO dummy* equals to one if CEO has ever held a political or government position, worked as a journalist, has been CEO at a bank, or has been a chair man or a vice chairman at some association. If a CEO himself has a large network, he is more likely to bring qualified friends from his/her network into firm operations and the ratio of connected outside directors increases.

In the second-stage regressions, firm value is regressed on the predicted ratios of independent directors and connected directors from the first-stage regression along with other variables. In both stage of regressions, board characteristics include its size and members'

average age. *Board size* is the natural logarithm of the total number of outside directors.[25] *Board age* is the natural logarithm of the average age of outside board members. We also include firm-specific financial variables. *Firm size* is the natural logarithm of total assets; *CAPEX/Assets* is the ratio of capital expenditures to total assets; *Leverage* is the ratio of total debt to total assets; *Current Profitability* is earnings before interest and taxes (EBIT) to total assets at the beginning of the year. *Distress* is a dummy standing for a financially distressed firm. *Sensitivity to market risk (beta)* is calculated by regressing the firm's monthly returns over the past year on the Korea Composite Stock Price Index (KOSPI) monthly returns. In addition, non-financial information such as ownership concentration and types of business organization are included in the regression. To avoid a causality problem between ownership and firm value (Demsetz and Lehn, 1985; Cho, 1998), we use a lagged value of ownership of the largest shareholders, *Lag (largest ownership)*. The *Standalone* dummy takes 1 for firms not belonging to one of the 50 largest chaebols. Furthermore, the two-digit primary Standard Industrial Classification (SIC) code dummies are included to control for *Industry* fixed effects. Meanwhile, *Year* dummies account for economy-wide shocks. All regressions use the standard errors for heteroskedasticity and double-cluster the errors at the firm and time levels.

The first two columns in Table 4 report the first stage regression results. *Highly-networked CEO* is significantly positively correlated with board connectedness, and negatively correlated with the board independence. This suggests that CEOs with extensive social networks have a tendency to hire people from their networks. On the other hand, firms have more connected boards when they have older boards, have large assets, are chaebol-affiliated or are financially distressed. The last column in Table 4 reports the second stage regression result. It shows that the predicted ratio of independent outside directors has a positive effect on Tobin's Q, while the predicted ratio of connected outside directors negatively affects Tobin's Q. In summary, the positive (negative) association between board independence (connectedness) and Tobin's Q

[25] Large boards are likely to increase to advice (Coles, Daniel, Naveen 2008) while they tend to lower value of firm value (Yermack, 1996, Eisenberg, Sundrgen and Wells, 1998)

does not seem to be driven by the endogeneity of the board composition. Hereafter, *Independent/Connected outsiders* in all the other regressions are fitted values from a first stage regression using 2SLS in Table 4.

[insert Table 4 around here]

A. Effect of Board Independence/Friendliness and corporate environments

To examine how the interactions of board independence/connectedness and corporate environments affect firm value, we add corporate environments and its interaction terms with predicted I_{ijt} and predicted F_{ijt} to equation (3).

$$Tobin's\ Q = \alpha + \beta Predicted\ I_{ijt} + \gamma Predicted\ F_{ijt} + \delta C_{ijt} + \theta Predicted\ I_{ijt} C_{ijt} + \rho Predicted\ F_{ijt} C_{ijt} + control\ variables + \varepsilon \quad (3)$$

where C_{ijt} represents corporate environments for firm *i*, industry *j*, and year *t*. First, we examine whether connected or independent outside directors influence firm value positively under the specific environments. In particular, we examine whether the marginal effect depends upon environment variables surrounding a firm, such as information cost (transparency), agency problem, vulnerability (to outside threats), and regulatory environments. As the marginal effect of board independence and connectedness on firm value is $\partial Q/\partial I = \beta + \theta E(C)$ or $\partial Q/\partial F = \gamma + \rho E(C)$, the hypotheses are $\partial^2 Q/(\partial I \partial C) = \theta$ or $\partial^2 Q/(\partial F \partial C) = \rho$, which lead to testing if θ=0 or ρ=0.

B. Boards as Monitors and Corporate Information Environments

This section reports how interactions between independence or connectedness of board, and information environments affect firm value when information environments are measured with *two information transaction costs (GH, HFV), firm size, analyst reports, credit rating, and*

transparency index. *GH (HFV)* is an indicator variable which takes zero, one, or two based on tertile ranks of information transaction costs. When *GH (HFV)*=2 (or 0), directors incur the highest (or lowest) costs to acquire and process the information on the firm.

Table 4 summarizes the results of the monitoring role of independent boards in the perspective of an information transaction costs perspective. Coefficients of the interaction terms of *independent outsiders* with *GH (HFV)* are negative and significant in columns (1) and (2). These results show that the effect of independent board members on firm value is higher when information transaction costs decrease. When *GH*=0, the net marginal effect of an increase in the fraction of independent outsiders on Tobin's Q is +0.288. When *GH*=1, the net marginal effect is 0.037 (=0.288+(-0.251*1)) and when *GH*=2, the net marginal effect is -0.214 (=0.288+(-0.251*2)). Coefficients of the interaction terms of *independent outsiders* with *firm size* and *analyst reports* are all positive and significant in columns (3) and (4). Similarly, those with *credit rating dummy* and with *transparency* are positive and significant in columns (5) and (6). These results show that the effect of independent board members on firm value is higher when firms are large, have more analyst reports, have higher credit ratings or have greater transparency. On the other hand, coefficients of interaction terms of *connected outsiders* with information environment variables are all insignificant. In short, these results suggest that the monitoring role of independent outside directors is more effective in firms with low information asymmetry or with better transparency as these independent directors do not have to incur high costs for information acquisition or processing.

[insert Table 5 around here]

C. Boards as Monitors and Agency Problems

Next, we examine whether independent boards' monitoring depends on the degree of potential agency problems measured through high free cash flow and low ownership of largest shareholders and insiders. Table 5 shows that the interaction term of free cash flow with

connected outsiders has a negative and significant coefficient, while that with *independent outsiders* has a positive but insignificant one. Lack of independence lowers firm value when managers have slack to waste their corporate resources, suggesting the importance of independence in monitoring. The coefficient of interaction term of ownership concentration with *connected outsiders* is positive, while it is negative with *independent outsiders*. When insiders' or largest shareholders' interest is more closely aligned with that of minority shareholders, monitoring becomes less important and the value of independent boards also decreases. In short, firms with greater potential agency problems show larger effects of independent boards, implying that board monitoring becomes more important in firms with large agency problems.

[insert Table 6 around here]

D. Boards as Advisors and Volatility (Uncertainty)

We examine the effects of advisory role of friendly boards on firm value when firms face high uncertainty and risky situations. To control for advisory capability, we control for outside directors' social capital and their expertise. The ratio of outside directors who graduated from top five schools represents the size of social network and social capital (Belliveau, Reilly and Wade, 1996). We also control for outside directors' expertise by including the portion of outside directors who are lawyers, accountants and persons with finance backgrounds (Krishnan, Wen, Zhao, 2011; Carcello, Hollingsworth, Neal, 2006). Table 6 presents how board connectedness interacts with the firms' financial volatility measured through greater stock return or sales volatility. The interaction term of *connected outsiders* with financial volatility has a positive and significant coefficient while that of *independent outsiders* shows a negative, insignificant coefficient. These findings suggest that the marginal effects of connected outside directors on Tobin's Q are positive when stock return volatility is larger than as 0.642 as its effect is (-0.448+ 0.698*(stock return volatility)). As the top 25% of stock return volatility is 0.692, we can infer that many firms would experience positive effects of connected outside directors.

Consistent with our earlier findings, the results indicate that firms with high volatility typically have a lower valuation of board independence and a higher valuation of connected outsiders.

[insert Table 7 around here]

E. Boards as Advisors and External Threats

Table 8 reports how the advisory role of independent/connected outside directors differs for firms exposed to outside threats. Corporate vulnerability to outside threats is measured by *M&A threat, standalone, and distress*. The results show that the interaction terms of outside threats with *independent outsiders* have negative coefficients (all significant except for distress) while the interaction terms with *connected outsiders* all have positive, significant ones. All measures of vulnerability yield consistent results; *connected outsiders* yield higher effects on firm value than independent directors, although the significance levels differ across measures. The results imply that a connected outside director can be valuable for firms vulnerable to outside threats. For example, the marginal effect of connected outside directors on Tobin's Q is positive when a firm experiences an M&A threat (-0.134+0.301=0.167).

[insert Table 8 around here]

F. Boards as Boundary Spanners and Regulatory Environments

In this analysis, we examine the boundary spanner role of board members. Compared to firms that export goods abroad, firms only operating in domestic markets are more subject to domestic regulatory authorities' influence. We control for directors' ability as boundary spanner by introducing their political connection variable as they have experience at governments, regulatory authorities, and political party connection. *Board networking ability* is the ratio of the outside directors who have ever held a political or government position to board size. Table 9 shows that connected outside directors who have social ties with CEOs/controlling shareholders improve firm performance when a firm exclusively operates in domestic markets

in column (1) and when the firm has more entertainment expenses in column (2). These results suggest that for firms sensitive to regulations/government policy or engaging in extensive lobbying, connected directors can serve as boundary spanners to increase firm value. For example, the marginal effects of connected outside directors on Tobin's Q are positive for a firm operating in domestic markets only (-0.188+ 0.367=0.179).

[insert Table 9 around here]

G. Joint Regression Analysis for the Multiple Roles of Friendly Boards

In Table 10, we include all interactions of *connected outsiders* and independent outsiders into one regression equation to examine when connected and independent outside directors improve firm value. The joint regression analysis shows that *connected outsiders* affect Tobin's Q positively when the firm is under the challenging circumstance such as high stock return volatility or when the firm has high entertainment expenses. On the other hand, the joint regression analysis shows that *independent outsiders* affect Tobin's Q negatively when the firm is under the challenging circumstance such as high sales volatility, M&A threats or when the firm operates in domestic markets only. These results are consistent with our hypothesis that a firm needs a friend when the firm faces large uncertainty or regulatory environments.

[insert Table 10 around here]

V. Conclusion

While the recent corporate governance literature emphasizes the importance of outside directors' independence from their firm to serve as effective monitors, outside directors can also play other roles such as advisor and boundary spanner. Therefore, the success of outside directors depends on which roles are warranted by different corporate environments and

whether directors are independent or connected to insiders. While independent outside directors can serve as better monitors, friendly outside directors can be better advisors or boundary spanners. Furthermore, we argue that the effects of board independence or connectedness on firm performance vary according to different corporate needs stemming from various firm characteristics and corporate environments.

Using detailed information on business and professional relationships as well as information on social ties between outside directors and firm insiders, we examine how the effects of independent or connected directors on firm value depend on the corporate environment. Overall, our evidence suggests that a higher ratio of independent directors on a board improve firm value. When firms face greater agency problems or incur low information transaction costs, monitoring by independent directors increases firm value. However, compared with independent directors, connected boards have a positive impact on firm value when firms face external corporate control risks, when firms face large volatility, or when firms are subject to regulatory/lobbying conditions.

Our results argue that although board independence has been emphasized by the public and shareholder activists, some firms do not actually benefit much from independent directors' monitoring. The value of independence depends on firm characteristics and corporate environments such as corporate information environments, volatile financial conditions or corporate vulnerability to outside threats. Furthermore, connected directors can be of value if a firm needs a boundary spanner to facilitate the firm's access to outside resources or regulatory agencies. Some environments weaken the effect of board independence on firm value, indicating that the effects hinge on the different roles required of directors.

Our study sheds insight onto why, even in the same country under the same capital market governance systems, some firms are more likely to appoint independent directors while other firms often appoint friendly directors. Our results imply that the traditional practice of appointing a close counselor as a board member may persist because outside directors fulfill different roles and friendly directors can add firm value in some specific corporate environment

at a particular time.

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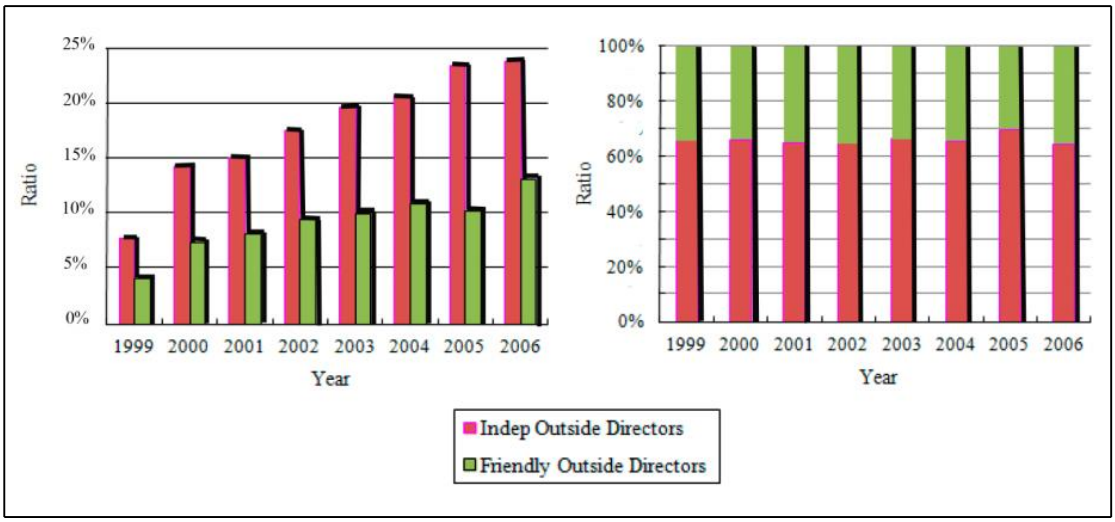

Fig. 1. Board structure trends: 1999-2006.
Figures show mean values of the ratio of independent outside directors to connected outside directors from year-end 1999 through year-end 2006. The sample includes 578 unique firms covering 3,836 firm-years. The figure on the left reports the percent of independent outside directors and connected outside directors over the total board size. The figure on the right displays the ratio of independent and connected outside directors over the number of total outside directors

Table 1

Descriptive statistics on firm-specific characteristics from 1999 to 2006

The sample firms are drawn from FnDataguide. Characteristics of the board of directors are taken from several sources. *Tobin's Q* is the ratio of the sum of the market value of common equity, the book value of preferred equity, and the book value of long-term debt to the book value of assets. Outside directors are the directors who are not employees of the company and have no operational responsibilities within the company. *Independent outside boards* is the ratio of outside directors who have no business, social or personal ties to a firm to the total number of board of directors. *Connected outside boards* is the ratio of outside directors who appear to have business, social or personal ties to a firm to the total number of board of directors. *Board size* is the natural logarithm of total number of outside directors. *Board age* is the age of outside board members as of the end of year. *Highly-networked CEO dummy* equals to one if CEO has ever held a political or government position, worked as a journalist, has been CEO at a bank, or has been a chair man or a vice chairman at some association. *Board advisory ability* is the ratio of the outside directors who graduated from the top 5 universities to the total number of board of directors. *Board expertise* is the ratio of the outside directors who have expertise in law, accounting, or finance to the total number of board of directors. *Boards' networking ability* is the ratio of the outside directors who have ever held a political or government position to the total number of board of directors. *GH* or *HFV* are indicator variables that take 0, 1 or 2 based on the tertile ranks of information transaction costs estimated by the Glosten and Harris (1988) model or the Hasbrouck (1991)–Foster and Viswanathan (1993) model using the Trade and Quote (TAQ) data. *Analyst report* is the total number of analyst reports in a given year. *Transparency* is the natural logarithm of the sum of transparency related items on the Korea Corporate Governance Index (KCGI) between 2002 and 2006. *Free cash flow* is calculated by taking operating cash flow and subtracting capital expenditures, which is normalized by assets. *Largest ownership* is the shareholding ratio of the largest shareholder. *Stock return volatility* is measured as the annualized standard deviation of daily returns during a given year. *M&A threat dummy* is one for a firm that has even been announced as targeted for M&A over the previous or the following 3 years, and 0 for otherwise. *Distressed* is a dummy that takes 1 when a firm experienced ordinary income losses in 3 recent consecutive years, or an equity loss in a given year. *Standalone* is one when a firm is not affiliated with one of the 50 largest chaebols (based on annual asset size). *Sales volatility* is measured as the standard deviation of Sales from year t-4 to year t. *Domestic firm* is a dummy variable that indicates firms operate in domestic markets only. *Entertainment expenses/sales* is the entertainment expenses ratio over total sales. *Firm size* is the natural logarithm of total assets/1,000,000. *Current profitability* is the ratio of earnings before interest and taxes (EBIT) to beginning total assets. *CAPEX/Assets* is the ratio of capital expenditures to total assets. *Leverage* is the ratio of total debt to total assets. *Sensitivity to market risk (beta)* is calculated by regressing the firm's monthly returns over the past year are regressed on the KOSPI monthly returns.

Variable	First quartile	Mean	Median	Third quartile	Standard deviation	Sample size
Tobin's Q	0.672	0.933	0.813	1.030	0.530	3,836
Independent outside boards	0.000	0.178	0.200	0.250	0.152	3,836
Connected outsider boards	0.000	0.091	0.042	0.112	0.114	3,836
Board size	1.609	1.826	1.946	2.197	0.710	3,836
Board age	51.927	53.378	53.564	55.113	0.090	3,836
Highly-networked CEO dummy	0.000	0.114	0.000	0.000	0.317	3,836
Board advisory ability	0.000	0.046	0.000	0.083	0.077	3,836
Board expertise	0.000	0.042	0.000	0.067	0.071	3,836
Board networking ability	0.000	0.090	0.000	0.111	0.196	3,836
GH	0.000	1.000	1.000	2.000	1.000	3,836
HFV	0.000	1.000	1.000	2.000	1.000	3,836
Analyst report	0.000	2.877	0.000	2.000	5.620	3,836
Credit dummy	0.000	0.383	0.000	1.000	0.486	3,836
Transparency	2.773	2.956	2.996	3.219	0.405	2,150
Free cash flow	-0.021	0.034	0.034	0.094	0.183	3,836
Largest ownership	0.202	0.335	0.316	0.453	0.175	3,836
Insider ownership	0.001	0.142	0.117	0.238	0.143	3,836
M&A threat dummy	0.000	0.069	0.000	0.000	0.253	3,836
Standalone dummy	1.000	0.810	1.000	1.000	0.393	3,836
Distressed dummy	0.000	0.381	0.000	1.000	0.486	3,836
Stock return volatility	0.377	0.561	0.498	0.692	0.259	3,836
Sales volatility	0.013	0.075	0.062	0.137	0.270	3,836
Domestic firm dummy	0.000	0.403	0.000	1.000	0.491	3,836
Entertainment expenses/sales	0.001	0.003	0.002	0.003	0.005	3,836
Firm size	4.479	5.522	5.282	6.330	1.483	3,836
CAPEX/Assets	0.006	0.044	0.025	0.062	0.312	3,836
Leverage	0.351	0.515	0.494	0.641	0.257	3,836
Current profitability	0.006	0.022	0.032	0.067	0.142	3,836
Sensitivity to market risk(beta)	0.476	0.728	0.723	0.998	0.376	3,836

Table 2
The Trend of Outside Board Characteristics

Year	Board size	Board age	Board advisory ability	Board expertise	Board networking ability
1999	5.308	50.9	0.014	0.039	0.021
2000	5.412	50.7	0.025	0.024	0.031
2001	6.018	52.1	0.026	0.034	0.060
2002	6.107	52.2	0.042	0.042	0.067
2003	6.213	53.6	0.065	0.036	0.071
2004	6.867	53.9	0.058	0.037	0.164
2005	6.757	55.3	0.064	0.064	0.136
2006	6.402	55.8	0.070	0.067	0.152
Mean	6.210	53.4	0.046	0.042	0.090

Table 2 reports the annual trends of the characteristics of outside boards of the sample firms. We hand-collected information from 578 firms on age, educational backgrounds, title, ranking within a company, and career paths for each top manager from 1999 to 2006, totaling 3,836 firm-years. *Board size* is the total number of outside directors. *Board age* is the age of outside board members as of the end of year. *Board advisory ability* is the ratio of the outside directors who graduated from the top 5 universities to the total number of board of directors. *Board expertise* is the ratio of the outside directors who have expertise in law, accounting, or finance to the total number of board of directors. *Board's networking ability* is the ratio of the outside directors who have ever held a political or government position to the total number of board of directors. See Table 1 for exact definitions of the variables.

Table 3

Univariate analysis of "Connected/Independent" firms

We compare the 63 firms that have the highest ratio of friendly boards to the same number of firms that have never had a friendly board. We use the information on fair disclosures of our sample firms from 1995 to 2011. *Firm size* is the natural logarithm of total assets/1,000,000. The frequency of *Main changes in investment* is based on fair disclosures such as company establishment, block trading, affiliates range, spin-off, merge, and seasoned offering. The frequency of *Main business activities* is such as overseas expansion, commodities development, and agreement on a contract. ** and * denote statistical significance at the 5% and 10% levels, respectively.

	Friendly firms (A)	Independent firms (B)	Difference (t-stat.) (A-B)
Firm size	5.585	5.579	0.037
Main changes in investment	29.3	21.7	1.675*
Main business activities	32.7	20.7	1.971**
N	63	63	

Table 4

Two Stage Least Squares Results

This table presents 2SLS results, using *Highly-networked CEO dummy* to instrument for Board independence/friendliness during 1999-2006. Each column reports estimates from a single regression, with standard errors (robust and clustered by firm and time) in parentheses. The first stage (column (1) and (2)) regresses *Independent outside boards* and *Connected outside boards* on *Highly-networked CEO dummy*, *Stock return volatility*, and other variables. *Highly-networked CEO* dummy equals to one if CEO has ever held a political or government position, worked as a journalist, been CEO at a bank, or has been a chair man or a vice chairman at some association. *Stock return volatility* is measured as the annualized standard deviation of daily returns during the year. The second stage uses the fitted values of independent outside boards and connected outside boards from the first stage as an explanatory variable. See Table 1 for exact definitions of the variables. *Industry dummies* and *year dummies* are employed to control for industry fixed effects and economy-wide shocks. Levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

	First stage		Second stage
Variable	Independent Outside Boards (1)	Connected Outside Boards (2)	Tobin's Q (3)
Independent outside boards			0.203***
			(0.054)
Connected outside boards			-0.090
			(0.073)
Highly-networked CEO dummy	-0.019**	0.017***	
	(0.009)	(0.006)	
Stock return volatility	-0.003*	0.001	
	(0.002)	(0.002)	
Board size	-0.023***	0.002	0.011
	(0.008)	(0.006)	(0.022)
Board age	-0.024	0.051***	-0.729***
	(0.027)	(0.019)	(0.071)
Largest ownership	-0.028*	0.001	-0.004
	(0.015)	(0.012)	(0.044)
Standalone dummy	0.031***	-0.019***	-0.048**
	(0.008)	(0.006)	(0.022)
CAPEX/Assets	0.002	0.011	-0.008
	(0.015)	(0.011)	(0.023)
Leverage	-0.004	-0.004	0.450***
	(0.015)	(0.011)	(0.038)
Firm size	0.037***	0.004**	0.005
	(0.003)	(0.002)	(0.008)
Current profitability	-0.046**	-0.030*	-0.052
	(0.023)	(0.016)	(0.058)
Distressed dummy	0.010	0.011**	-0.029*
	(0.007)	(0.005)	(0.017)
Sensitivity to market risk(beta)	-0.010	0.015**	0.086***
	(0.009)	(0.006)	(0.023)
GH	0.021	-0.010	0.056
	(0.016)	(0.011)	(0.048)
Analyst report	0.001	0.007	0.072***
	(0.008)	(0.006)	(0.025)
Credit rating dummy	-0.009	0.006	-0.072***
	(0.007)	(0.005)	(0.023)
Free cash flow	0.026	-0.003	-0.200***
	(0.018)	(0.013)	(0.056)
M&A threat	0.015	0.003	-0.040
	(0.011)	(0.008)	(0.035)
Domestic firm dummy	-0.009	0.008*	0.008
	(0.007)	(0.004)	(0.020)
Entertainment	0.004	-0.001	0.037
	(0.008)	(0.005)	(0.023)
Industry dummy	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes
Number of firms	3,836	3,836	3,836
Adj. R^2	0.211	0.076	0.326

Table 5

The monitoring role of independent boards: an information transaction costs perspective

The dependent variable is *Tobin's Q*, which is the ratio of the sum of the market value of common equity, the book value of preferred equity, and the book value of long-term debt to the book value of assets. *Independent outside boards* is the ratio of outside directors who have no business and no personal ties within a firm to board size. *Connected outside boards* is the ratio of outside directors who appear to have business or personal ties to a firm to board size. *Independent/Connected outsiders* are fitted values from a first-stage regression in Table 3. *GH* or *HFV* is information transaction costs estimated by either the Glosten and Harris (1988) model or by the Hasbrouck (1991)–Foster and Viswanathan (1993) model. *GH (HFV)* is an indicator variable which equals zero if *GH (HFV)* is in the bottom third of its distribution, one if *GH (HFV)* is in the medium third of its distribution, and two otherwise. *Firm size* is the natural logarithm of total assets/1,000,000. *Analyst report* is the total number of analyst reports within a given year. *Credit rating dummy* for companies with credit ratings for CPs or corporate bonds are given a "1", for companies without credit ratings for CPs or corporate bonds are given a "0". *Transparency* is the natural logarithm of the sum of transparency related items on Korea Corporate Governance Index (KCGI) between 2002 and 2006. See Table 1 for exact definitions of the variables. We correct the standard errors for heteroskedasticity and double-cluster the errors at the firm and time level. Levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

	Tobin's Q					
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Independent outside boards	0.288***	0.231***	-0.407***	0.047	0.080	-0.428
	(0.053)	(0.053)	(0.184)	(0.064)	(0.076)	(0.502)
Connected outside boards	-0.121	-0.099	-0.023	-0.058	-0.135	-0.138
	(0.073)	(0.073)	(0.263)	(0.082)	(0.093)	(0.720)
Board size	0.020	0.021	0.022	0.008	0.018	0.037
	(0.022)	(0.022)	(0.022)	(0.021)	(0.022)	(0.037)
Board age	-0.768***	-0.774***	-0.736***	-0.611***	-0.727***	-1.259***
	(0.079)	(0.078)	(0.071)	(0.069)	(0.071)	(0.128)
Largest ownership	-0.011	-0.010	0.003	0.047	-0.009	0.057
	(0.045)	(0.045)	(0.044)	(0.043)	(0.044)	(0.061)
Standalone dummy	-0.053**	-0.052**	-0.050**	-0.008	-0.057**	-0.082***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.031)
CAPEX/Assets	-0.008	-0.006	-0.008	-0.006	-0.007	-0.025
	(0.023)	(0.023)	(0.023)	(0.022)	(0.023)	(0.027)
Leverage	0.345***	0.346***	0.442***	0.473***	0.455***	0.259***
	(0.044)	(0.043)	(0.037)	(0.037)	(0.038)	(0.063)
Firm size	0.009	0.010	-0.018*	-0.068***	0.011	0.014
	(0.008)	(0.008)	(0.010)	(0.009)	(0.008)	(0.012)
Current profitability	-0.138**	-0.132**	-0.060	-0.057	-0.069	-0.398***
	(0.064)	(0.063)	(0.058)	(0.056)	(0.059)	(0.090)
Distressed dummy	-0.019	-0.018	-0.028	-0.024	-0.030*	-0.022
	(0.018)	(0.018)	(0.018)	(0.017)	(0.018)	(0.026)
Sensitivity to market risk(beta)	0.086***	0.084***	0.086***	0.064***	0.093***	0.115***
	(0.024)	(0.024)	(0.023)	(0.022)	(0.023)	(0.034)
GH	0.038					
	(0.028)					
HFV		0.039				
		(0.024)				
Analyst report				0.026***		
				(0.003)		
Credit rating dummy					-0.105***	
					(0.027)	
Transparency						0.127**
						(0.050)
Independent outside boards * GH	-0.251*					
	(0.147)					
Connected outside boards * GH	0.107					
	(0.438)					
Independent outside boards * HFV		-0.242*				
		(0.129)				
Connected outside boards * HFV		0.232				
		(0.474)				
Independent outside boards * Firm size			0.104***			
			(0.027)			
Connected outside boards * Firm size			-0.015			
			(0.043)			
Independent outside boards * Analyst report				0.010*		
				(0.006)		
Connected outside boards * Analyst report				-0.002		
				(0.010)		
Independent outside boards *Credit rating dummy					0.231**	
					(0.100)	
Connected outside boards * Credit rating dummy					0.092	
					(0.146)	
Independent outside boards * Transparency						0.258*
						(0.157)
Connected outside boards * Transparency						-0.001
						(0.237)
Industry (Year) dummy	Yes	Yes	Yes	Yes	Yes	Yes
Number of firms	3,836	3,836	3,836	3,836	3,836	2,150
Adj. R^2	0.248	0.248	0.259	0.299	0.259	0.290

Table 6

The monitoring role of independent boards: an agency theory perspective

This table presents the results when the dependent variable Tobin's Q is regressed on board independence/friendliness and various firm characteristics from 1999-2006. Tobin's Q is the ratio of the sum of the market value of common equity, the book value of preferred equity, and the book value of long-term debt to the book value of assets. *Independent outside boards* is the ratio of outside directors who have no business and no personal ties within a firm to board size. *Connected outside boards* is the ratio of outside directors who appear to have business or personal ties to a firm to board size. *Independent /Connected outside boards* are fitted values from a first-stage regression in Table 3. *M&A threat* is a dummy variable. *Standalone dummy* is a dummy variable to indicate whether a firm does not belong to one of the 50 largest chaebols. *Distressed* is a dummy that takes the value of "1" when a firm experienced ordinary income losses within 3 recent years, or an equity loss in the given year. *Free cash flow* is calculated by taking operating cash flow and subtracting capital expenditures. *Inside ownership* concentration is the percentage of the firm's outstanding shares held by insiders (e.g., CEO, executive managers, and inside auditors). See Table 1 for exact definitions of the variables. *Industry dummies* and *year dummies* are employed to control for industry fixed effects and economy-wide shocks. Standard errors are shown in parentheses under parameter estimates. We correct the standard errors for heteroskedasticity and double-cluster the errors at the firm and time level. Levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

	Tobin's Q		
Variable	(1)	(2)	(3)
Independent outside boards	0.181***	0.304***	0.318***
	(0.056)	(0.101)	(0.065)
Connected outside boards	-0.058	-0.115	-0.109
	(0.076)	(0.154)	(0.103)
Board size	0.011	0.012	0.021
	(0.022)	(0.022)	(0.022)
Board age	-0.701***	-0.729***	-0.707***
	(0.071)	(0.071)	(0.071)
Largest ownership	-0.001	0.058	0.014
	(0.044)	(0.070)	(0.045)
Insider ownership			0.021
			(0.092)
Standalone dummy	-0.050**	-0.047**	-0.046**
	(0.022)	(0.022)	(0.022)
CAPEX/Assets	-0.031	-0.008	-0.008
	(0.023)	(0.023)	(0.023)
Leverage	0.469***	0.453***	0.440***
	(0.038)	(0.038)	(0.038)
Firm size	0.006	0.004	-0.003
	(0.008)	(0.008)	(0.008)
Current profitability	-0.088	-0.051	-0.041
	(0.059)	(0.058)	(0.058)
Distressed dummy	-0.035**	-0.028	-0.035**
	(0.018)	(0.018)	(0.018)
Sensitivity to market risk(beta)	0.094***	0.087***	0.081***
	(0.023)	(0.023)	(0.023)
Free cash flow	-0.185***		
	(0.062)		
Independent outside boards * Free cash flow	0.250		
	(0.219)		
Connected outside boards * Free cash flow	-0.671*		
	(0.399)		
Independent outside boards * Largest ownership		-0.397*	
		(0.238)	
Connected outside boards * Largest ownership		0.068	
		(0.416)	
Independent outside boards * Insider ownership			-1.274***
			(0.381)
Connected outside boards * Insider ownership			0.210
			(0.529)
Industry(Year) dummy	Yes	Yes	Yes
Number of firms	3,836	3,836	3,836
Adj. R^2	0.262	0.257	0.261

Table 7

The advisory role of friendly boards: the perspective of volatility (uncertainty)

The dependent variable Tobin's Q is regressed on board independence/friendliness and various firm characteristics from 1999 to 2006. Tobin's Q is the ratio of the sum of the market value of common equity, the book value of preferred equity, and the book value of long-term debt to the book value of assets. *Independent outside boards* is the ratio of outside directors who have no business and no personal ties within a firm to board size. *Connected outside boards* is the ratio of outside directors who appear to have business or personal ties within a firm to board size. *Independent /Connected outside boards* are fitted values from a first-stage regression in Table 3. *Board advisory ability* is the ratio of the outside directors who graduated from the top 5 universities to the total number of board of directors. *Board expertise* is the ratio of the outside directors who have expertise in law, accounting, or finance. *Stock return volatility* is measured as the annualized standard deviation of daily returns during the year. *Sales volatility* is measured as the standard deviation of Sales from years t-4 to t. See Table 1 for exact definitions of the variables. *Industry dummies* and *year dummies* are employed to control for industry fixed effects and economy-wide shocks. Standard errors are in parentheses. We correct the standard errors for heteroskedasticity and double-cluster the errors at the firm and time level. Levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

	Tobin's Q	
Variable	(1)	(2)
Independent outside boards	0.275***	0.289***
	(0.117)	(0.056)
Connected outside boards	-0.448***	-0.067
	(0.170)	(0.074)
Board size	0.032	0.012
	(0.021)	(0.022)
Board age	-0.625***	-0.703***
	(0.070)	(0.071)
Largest ownership	0.019	-0.019
	(0.044)	(0.044)
CAPEX/Assets	0.002	0.019
	(0.022)	(0.027)
Leverage	0.353***	0.453***
	(0.038)	(0.038)
Firm size	0.024	0.004
	(0.008)	(0.008)
Current profitability	-0.076	-0.068
	(0.058)	(0.059)
Distress dummy	-0.088***	-0.018
	(0.018)	(0.018)
Standalone dummy	-0.040*	-0.049**
	(0.022)	(0.023)
Sensitivity to market risk(beta)	-0.008	0.063***
	(0.024)	(0.023)
Stock return volatility	0.508***	
	(0.052)	
Sales volatility		0.003***
		(0.001)
Board advisory ability	0.303	0.305
	(0.246)	(0.247)
Board expertise	0.128**	0.129**
	(0.062)	(0.061)
Independent outside boards * Stock return volatility	-0.168	
	(0.188)	
Connected outside boards * Stock return volatility	0.698***	
	(0.287)	
Independent outside boards * Sales volatility		-0.010***
		(0.002)
Connected outside boards * Sales volatility		0.003*
		(0.002)
Industry dummy	Yes	Yes
Year dummy	Yes	Yes
Number of firms	3,836	3,836
Adj. R^2	0.292	0.274

Table 8

The advisory role of friendly boards: vulnerability to external control threats

The dependent variable Tobin's Q is regressed on board independence/friendliness and various firm characteristics from 1999-2006. Tobin's Q is the ratio of the sum of the market value of common equity, the book value of preferred equity, and the book value of long-term debt to the book value of assets. *Independent outside boards* is the ratio of outside directors who have no business and no personal ties within a firm to board size. *Connected outside boards* is the ratio of outside directors who appear to have business or personal ties to a firm to board size. *Independent /Connected outside boards* are fitted values from a first-stage regression in Table 3. *Board advisory ability* is the ratio of the outside directors who graduated from the top 5 universities over total managers. *Board expertise* is the ratio of the outside directors who have expertise in law, accounting, or finance. *M&A threat* is one for a firm that has even been announced as targeted for M&A over the previous or following 3 years of our sample period, and "0" for otherwise. *Standalone dummy* is one when a firm is not affiliate with one of the 50 largest chaebols. *Distressed* dummy is 1 when a firm has experienced ordinary income losses in recent 3 years, or an equity loss within the year. See Table 1 for exact definitions of the variables. *Industry dummies* and *year dummies* are employed to control for industry fixed effects and economy-wide shocks. Standard errors are shown in parentheses under parameter estimates. We correct the standard errors for heteroskedasticity and double-cluster the errors at the firm and time level. Levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

	Tobin's Q		
Variable	(1)	(2)	(3)
Independent outside boards	0.231***	0.162**	0.221***
	(0.054)	(0.064)	(0.066)
Connected outside boards	-0.134*	-0.057	-0.182**
	(0.075)	(0.086)	(0.093)
Board size	0.013	0.012	0.011
	(0.022)	(0.022)	(0.022)
Board age	-0.726***	-0.726***	-0.730***
	(0.071)	(0.071)	(0.071)
Largest ownership	-0.008	-0.002	-0.001
	(0.044)	(0.044)	(0.044)
Standalone dummy	-0.047**	-0.036	-0.047**
	(0.022)	(0.032)	(0.022)
CAPEX/Assets	-0.008	-0.008	-0.009
	(0.023)	(0.023)	(0.023)
Leverage	0.451***	0.448***	0.448***
	(0.038)	(0.038)	(0.038)
Firm size	0.004	0.005	0.005
	(0.008)	(0.008)	(0.008)
Current profitability	-0.052	-0.054	-0.054
	(0.058)	(0.059)	(0.059)
Distressed dummy	-0.029*	-0.028	-0.028
	(0.017)	(0.018)	(0.027)
Sensitivity to market risk(beta)	0.086***	0.086***	0.086***
	(0.023)	(0.023)	(0.023)
Board advisory ability	0.092	-0.141	-0.018
	(0.109)	(0.124)	(0.109)
Board expertise	0.126**	0.129**	0.128**
	(0.062)	(0.063)	(0.061)
M&A threat	0.017		
	(0.050)		
Independent outside boards * M&A threat	-0.297*		
	(0.180)		
Connected outside boards * M&A threat	0.301*		
	(0.185)		
Independent outside boards * Standalone		-0.141*	
dummy		(0.080)	
Connected outside boards * Standalone dummy		0.123*	
		(0.075)	
Independent outside boards * Distress			-0.065
			(0.101)
Connected outside boards* Distress			0.217*
			(0.131)
Industry(Year) dummy	Yes	Yes	Yes
Number of firms	3,836	3,836	3,836
Adj. R^2	0.261	0.261	0.262

Table 9

The boundary spanner role of friendly boards

This table presents the results when the dependent variable, Tobin's Q, is regressed on board independence/friendliness and firm characteristics from 1999 to 2006. Tobin's Q is the ratio of the sum of the market value of common equity and the book values of preferred equity and long-term debt to the book value of assets. *Independent outside boards* is the ratio of outside directors who have no business and no personal ties within a firm to board size. *Connected outside boards* is the ratio of outside directors who appear to have business or personal ties to a firm to board size. *Independent /Connected outside boards* are fitted values from a first-stage regression in Table 3. *Board networking ability* is the ratio of the outside directors who have ever held a political or government position to board size. *Domestic firm dummy* is one when a firm operates in domestic markets only. See Table 1 for exact definitions of the variables. *Industry dummies* and *year dummies* are employed to control for industry fixed effects and economy-wide shocks. Standard errors are shown in parentheses. We correct the standard errors for heteroskedasticity and double-cluster the errors at the firm and time level. Levels of significance are indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

	Tobin's Q	
Variable	(1)	(2)
Independent outside boards	0.282***	0.221***
	(0.063)	(0.055)
Connected outside boards	-0.188**	-0.191***
	(0.085)	(0.078)
Board size	0.007	0.002
	(0.021)	(0.021)
Board age	-0.726***	-0.717***
	(0.067)	(0.067)
Largest ownership	-0.022	-0.005
	(0.042)	(0.042)
CAPEX/Assets	-0.006	-0.005
	(0.022)	(0.022)
Leverage	0.427***	0.440***
	(0.038)	(0.038)
Firm size	0.008	0.014*
	(0.007)	(0.007)
Current profitability	0.074	0.097
	(0.059)	(0.059)
Distress dummy	-0.026*	-0.026
	(0.016)	(0.017)
Standalone dummy	-0.029	-0.025
	(0.021)	(0.021)
Sensitivity to market risk(beta)	0.104***	0.102***
	(0.022)	(0.022)
Board's networking ability	0.146***	0.144***
	(0.041)	(0.042)
Domestic firm dummy	0.027	
	(0.025)	
Entertainment expenses/sales		0.047**
		(0.024)
Independent outside boards * Domestic firm dummy	-0.198**	
	(0.097)	
Connected outside boards * Domestic firm dummy	0.367***	
	(0.140)	
Independent outside boards * Entertainment expenses/sales		-0.085
		(0.110)
Connected outside boards * Entertainment expenses/sales		0.608***
		(0.171)
Industry dummy	Yes	Yes
Year dummy	Yes	Yes
Number of firms	3,836	3,836
Adj. R^2	0.272	0.276

Table 10: Joint regression analysis for the multiple roles of friendly boards

Dependent variables are Tobin's Q and *Industry-adjusted Tobin's Q*. *Connected (and independent) outside boards* are fitted values from a first-stage regression in Table 3. *Stock return (Sales) volatility* is the annualized standard deviation of daily stock returns (annual sales). *M&A threat, Standalone, Distressed*, *Domestic firm* are dummy variables defined in Table 1, representing firm and business environments. Definition of Board related variables are defined in Table 1. Other control variables include firm characteristic or environment variables used in interaction terms and *Largest ownership, CAPEX/Assets, Leverage, Firm size, Current profitability, Sensitivity to market risk*, which are as defined in Table 1. Standard errors are corrected for heteroskedasticity and shown in parentheses and double-cluster the errors at the firm and time level. ***, **, and * are significance level for 1%, 5%, and 10%, respectively.

Variable	Tobin's Q	Industry adjusted Tobin's Q
Connected outside boards	-0.360***	-0.328***
	(0.108)	(0.119)
Independent outside boards	0.234***	0.187*
	(0.067)	(0.081)
Board size	0.006	0.009
	(0.018)	(0.021)
Board age	-0.606***	-0.576***
	(0.060)	(0.072)
Board networking ability	0.141***	0.139***
	(0.044)	(0.047)
Board advisory ability	-0.138	0.127
	(0.125)	(0.129)
Board expertise	0.117*	0.109*
	(0.067)	(0.065)
Domestic firm dummy	-0.001	-0.002
	(0.016)	(0.014)
Entertainment expenses/sales	3.515**	3.169**
	(1.479)	(1.512)
Independent outside boards * Stock return volatility	-0.158	-0.161
	(0.179)	(0.181)
Connected outside boards * Stock return volatility	0.002***	0.002***
	(0.001)	(0.001)
Independent outside boards * Sales volatility	-0.011***	-0.014***
	(0.003)	(0.003)
Connected outside boards * Sales volatility	0.002	0.003
	(0.002)	(0.002)
Independent outside boards * M&A threat	-0.287*	-0.263
	(0.175)	(0.181)
Connected outside boards * M&A threat	0.293	0.301
	(0.207)	(0.211)
Independent outsider boards * Standalone dummy	-0.135	-0.129
	(0.092)	(0.089)
Connected outsider boards * Standalone dummy	0.072	0.138*
	(0.137)	(0.080)
Independent outside boards * Distress dummy	-0.071	-0.081
	(0.101)	(0.103)
Connected outside boards * Distress dummy	0.108	0.119
	(0.122)	(0.124)
Independent boards * Domestic firm dummy	-0.173**	-0.168*
	(0.088)	(0.091)
Connected outside boards * Domestic firm dummy	0.072	0.084
	(0.129)	(0.127)
Independent outside boards * Entertainment expenses/sales	-0.090	-0.089
	(0.102)	(0.104)
Connected outside boards * Entertainment expenses/sales	0.493***	0.481***
	(0.154)	(0.159)
Industry dummy	Yes	
Year dummy	Yes	Yes
Number of firms	3,836	3,836
Adj. R^2	0.449	0.402

Contribution to Economic Growth by Different Sized firms in China

Shanji Xin

Firm Size and Economic Growth in China

- The 23rd SJE International Symposium -

2015.10.31
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Seoul National University, South Korea

Contents

Introduction

- Over the last 30 years, China has experienced unprecedented economic transition involving rapid economic growth and major shifts in industrial structure.
- China's recent growth has been record-breaking, especially given its huge size. Thus, numerous studies have tried to find out the sources of economic growth in China.

Introduction

- In economic literature, the determinants of economic growth have been considered in diverse dimensions:
  - institutions (Acemoglu et al., 2001, 2002)
  - education (Barro, 1991)
  - openness of trade (Sachs and Warner, 1997)
  - **Firm size** (Schumpeter, 1942)
    - Job growth and stability (Davis and Haltiwanger, 1992; Davis et al., 1996; Rob, 1995)
    - Productivity growth (Pagano and Schivardi, 2003; Acs et al., 1999; Cheng and Lo, 2004)
    - Income growth (Shaffer, 2002)

Introduction

- Studies that examine advantages of big businesses versus small businesses can be divided into two streams:
  - Big businesses
    - Positive (Cassis, 1997; Fogel et al., 2008; Lee et al., 2013; Smyth, 2000)
    - Negative (Caree and Thurik, 1998; Caree, 2002)
  - Small firms (Beck et al., 2005; Audrestsch et al., 2002; Robbins et al., 2000)

=> All of these studies suggest that the net influence of firm size on macroeconomic performance is an important yet unresolved empirical question. However, the relation between firm size and economic growth in China remains unexplored.

Introduction

- To fill this research gap, this paper presents empirical evidence based on the nation-wide survey data of firms classified into their sizes and the origin provinces in China.
- Lee et al. (2013) posited that gaining real understanding of dynamics development requires that the analysis be extended to **the entire spectrum of firm size**.
- We thus investigates the role of large, medium, and small-sized enterprises in China's economic growth. We have constructed a provincial-level data basis for the 2004 to 2009 period. Then, we conduct an econometric analysis that tracks down the possibly different effects of big business and SMEs through different channels.

Introduction

❖ **Hypotheses**

I. China's economic growth is recently driven by emergence of a large number of small or medium-sized enterprises.

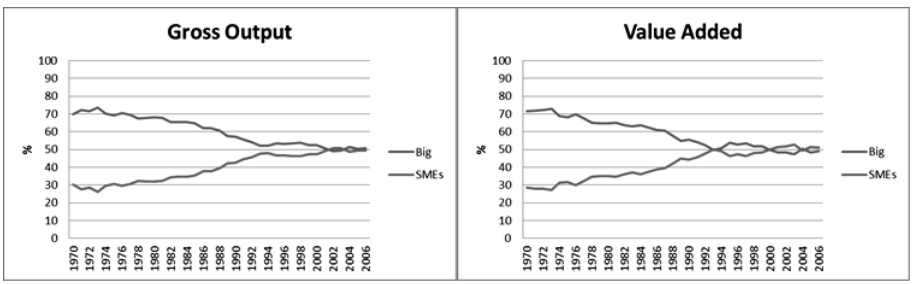
II. If newer firms are the sources of economic growth, it should be reflected in the increasing size per firm (average firms size), rather than just the growth of the number of firms.

III. Whether this trend would be observed not only in more developed eastern provinces but also in the less developed central and western provinces.

Comparative Lessons

❖ **Roles of the Different-sized Firms in Economic Growth in Korea**

- As is well-known, for South Korea, the high growth period is from the 1960s to the 1990s. While Korea is known for big business-oriented growth, compared to Taiwan, actual data show some interesting trend over time in the terms of precise share of the SMEs and big businesses.



Comparative Lessons

❖ **Roles of the Different-sized Firms in Economic Growth in Japan**

- The high growth period in post-war Japan is from the mid 1950s to the mid-1970s. It is reported that SMEs had played important roles in economic growth in Japan, particularly exports.
- From the end of the Second World War to the early 1980s, the share of SMEs in total exports has rapidly increased, especially before the mid-1960s when the proportion reached more than 60% (Li, 1992).

=> While we cannot be sure to what extent this pattern can be generalizable, it seems really an interesting pattern, namely the trend of the share of the SME vs big business in the early stage of economic take-off in post-war period. If we consider the post-reform economic growth in China as another episode of economic take-off or catch-up, it is worthwhile to examine the trend in China.

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Comparative Lessons

❖ **Observed Patterns in China**

- Firm Data: Annual surveys of Chinese industrial firms conducted by the National Bureau of Statistics.
  - All state-owned enterprises
  - Non-state-owned enterprises with annual sales of over five million RMB (Chinese currency)
- Firm variables:
  - Type 1: share of firms by size in total sales in each province and the whole nation
  - Type 2: share of firms by size in total number of firms in each province and the nation
  - Type 3: absolute number of firms in each province and the nation

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Comparative Lessons

Table 1A Definitions of large, medium and small enterprises in China

Sector	Index	Unit	Large	Medium	Small	Micro
Industry*	Employees(X)	Person	X≥1000	300≤X<1000	20≤X<300	X<20
	Business Income(Y)	**Million Yuan**	**Y≥40000**	**2000≤Y<40000**	**300≤Y<20000**	**Y<300**

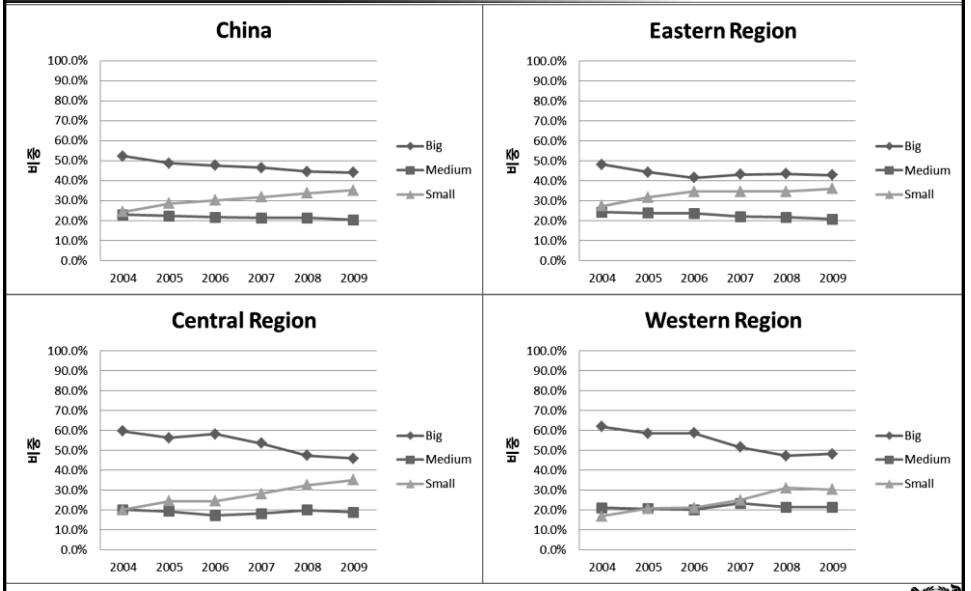
Table 1B Definitions of large, medium and small enterprises, modified by the authors

Sector	Index	Unit	Large	Medium	Small
Industry*	Employees(X)	Person	X≥1000	300≤X<1000	30≤X<300
	Business Income(Y)	**Million Yuan**	**Y≥40000**	**2000≤Y<40000**	**500≤Y<20000**

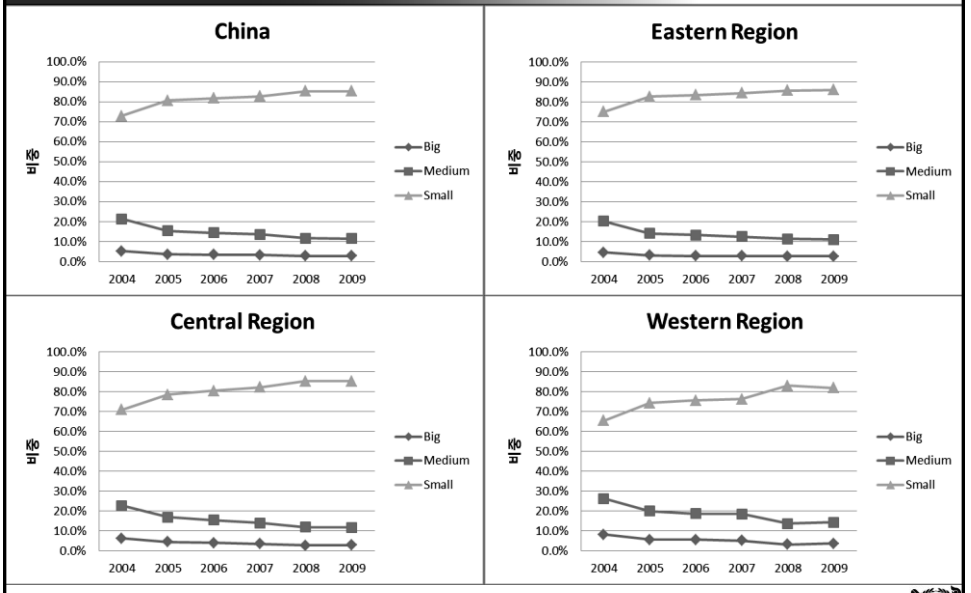
Source: China's National Bureau of Statistics

Note: "Industry*" contains mining, manufacturing, electricity generation, and the production and distribution of gas and water

❖ Type 1: Share of firms by size in total sales



❖ **Type 2: Share of firms by size in total number of firms**



Methodology and the Data Descriptions

❖ **Regression Models**

$$y_{it} = \alpha + \beta Z_{it1} + \gamma Basic_{it}^{'} + \delta Firmsize_{it} + \rho_{it}$$

i : *province* t : *time*

y_{it} : annual growth rate of real GRP per capita

Z_{it1} : log value of real GRP per capita in 2004

$Basic_{it}^{'}$: a vector of control variables often appearing in economic growth model

$Firmsize_{it}$: the key variable measured as

1) share of firms by size in total sales

2) share of firms by size in total number of firms

3) log of one plus the number of firms of different size

ρ_{it} : error term; $\rho_{it} = \mu_i + v_{it}$

❖ Variables used in the regressions: Variable Definition

Variable	Description	Variable Definition
Dependent Variable		
grpgr	GRP per capita growth rate	Annual real GRP per capita growth rate (%) (constant, preceding year=100)
Basic Control Variables		
inigrp	Initial GRP per capita	Log value of real GRP per capita in 2004
popgr	Population growth rate	Natural growth rate of population (%)
invt	Investment ratio	Total investment in fixed assets by status (% of GRP)
infl	Inflation rate	Overall consumer price index in each province (%)
gov	Government expenditure	Total government expenditure (% of GRP)
edu2	Secondary school enrollment	Share of the population with junior-secondary-school attainment in the total population aged 6 and above (%)
Dummy Variables		
central	Geographic dummy for central provinces	Dummy for Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei and Hunan
western	Geographic dummy for western provinces	Dummy for Inner-Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang

❖ Variables used in the regressions: Variable Definition

Variable	Description	Variable Definition
Firm Variable		
big1	Large enterprises	Share of the sales of large enterprises in the total provincial firms
medium1	Medium enterprises	Share of the sales of medium enterprises in the total provincial firms
small1	Small enterprises	Share of the sales of small enterprises in the total provincial firms
big2	Large enterprises	Share of the number of large enterprises in the total provincial firms
medium2	Medium enterprises	Share of the number of medium enterprises in the total provincial firms
small2	Small enterprises	Share of the number of small enterprises in the total provincial firms
big3	Large enterprises	Log of one plus the number of large enterprises
medium3	Medium enterprises	Log of one plus the number of medium enterprises
small3	Small enterprises	Log of one plus the number of small enterprises
bsales	Average size of large enterprise	Log value of average sales per large enterprise (constant, year 2004)
msales	Average size of medium enterprise	Log value of average sales per medium enterprise (constant, year 2004)
ssales	Average size of small enterprise	Log value of average sales per small enterprise (constant, year 2004)

❖ **Variables used in the regressions: Descriptive Statistics**

Variable	Obs.	Mean	Std. Dev.	Min	Max	Source
big1	174	52.00	12.61	27.08	82.84	
medium1	174	20.77	5.50	6.02	37.61	
small1	174	27.23	9.05	9.24	54.54	
big2	174	4.26	1.71	1.48	9.72	
medium2	174	15.95	4.57	7.92	28.65	
small2	174	79.79	6.02	61.63	90.31	
big3	174	4.98	1.02	2.08	7.17	Chinese Industrial
medium3	174	6.33	1.10	3.40	8.50	Enterprises Database
small3	174	7.98	1.19	4.82	10.22	
bsales	174	14.14	0.52	12.57	15.36	
msales	174	11.85	0.46	10.84	13.20	
ssales	174	10.46	0.34	9.67	11.47	
grdpgr	174	0.15	0.07	-0.02	0.33	
inigrdp	174	9.41	0.54	8.37	10.71	
popgr	174	5.20	2.68	0.00	11.78	
invt	174	52.38	13.12	29.25	89.35	Statistical Yearbook
infl	174	2.95	2.44	-2.30	10.10	of China
gov	174	17.23	6.70	7.92	45.02	
edu2	174	38.37	6.05	24.71	49.65	
central	174	0.28	0.45	0.00	1.00	
western	174	0.38	0.49	0.00	1.00	

Empirical results

❖ **The Bench Mark Model**

$$grpgr = f(big / medium / small, inigrp, popgr, invt, infl, gov, edu2, central, western)$$

- Firm variables:
  - Type 1: share of firms by size in total sales in each province
  - Type 2: share of firms by size in total number of firms
- Estimation Method:
  - Ordinary Least Squares (OLS)
  - Fixed Effects (FE)
  - System GMM

❖ Basic results: using the share of firms by size in total sales

Model	OLS			Fixed effects			System GMM		
big1	**-0.0012**			**-0.0023**			**-0.0030**		
	(-2.64)***			**(-2.82)*****			**(-3.56)*****		
medium1		**-0.0003**			**-0.0025**			**0.0073**	
		(-0.30)			**(-1.50)**			**(3.08)*****	
small1			**0.0027**			**0.0049**			**0.0037**
			(4.11)***			**(4.87)*****			**(4.08)*****
inigrdp	-0.0131	-0.0141	-0.0109				-0.4476	-0.8594	-0.3754
	(-0.81)	(-0.85)	(-0.69)				(-4.82)***	(-6.62)***	(-5.00)***
popgr	-0.0015	-0.0011	-0.0017	-0.0014	-0.0057	-0.0030	-0.0439	-0.0517	-0.0567
	(-0.71)	(-0.52)	(-0.85)	(-0.14)	(-0.58)	(-0.33)	(-4.15)***	(-4.69)***	(-5.22)***
invt	0.0007	0.0013	0.0002	0.0013	0.0018	0.0002	-0.0018	-0.0014	-0.0009
	(1.35)	(2.89)***	(0.38)	(1.48)	(2.18)**	(0.25)	(-1.75)*	(-1.38)	(-1.04)
infl	0.0119	0.0126	0.0114	0.0122	0.0135	0.0109	0.0120	0.0112	0.0128
	(6.10)***	(6.35)***	(5.95)***	(5.71)***	(6.33)***	(5.3)***	(5.55)***	(4.56)***	(6.20)***
gov	-0.0006	-0.0023	-0.0003	-0.0026	-0.0020	-0.0026	0.0010	-0.0064	0.0006
	(-0.51)	(-1.84)*	(-0.27)	(-0.92)	(-0.70)	(-0.97)	(0.46)	(-2.82)***	(0.30)
edu2	0.0007	0.0001	0.0006	-0.0053	-0.0044	-0.0057	0.0026	0.0091	-0.0042
	(0.67)	(0.11)	(0.64)	(-1.50)	(-1.24)	(-1.72)*	(1.05)	(3.17)***	(-1.77)*
central	0.0120	0.0016	0.0182				-0.5129	-1.0170	-0.4248
	(0.65)	(0.09)	(1.02)				(-4.73)***	(-6.79)***	(-4.72)***
western	0.0255	0.0156	0.0406				-0.2248	-0.5110	-0.1723
	(1.17)	(0.71)	(1.86)*				(-3.37)***	(-5.63)***	(-2.81)***
constant	0.2434	0.2135	0.1045	0.4207	0.2969	0.2494	4.9263	8.6276	4.2145
	(1.38)	(1.17)	(0.61)	(2.92)***	(2.17)**	(2.04)**	(5.19)***	(6.57)***	(5.08)***

❖ Basic results: using the share of firms by size in number of firms

Model	OLS			Fixed effects			System GMM		
big2	**-0.0198**			**-0.0426**			**-0.0458**		
	(-6.46)***			**(-11.49)*****			**(-9.02)*****		
medium2		**-0.0097**			**-0.0155**			**-0.0158**	
		(-8.89)***			**(-13.77)*****			**(-9.28)*****	
small2			**0.0073**			**0.0126**			**0.0116**
			(8.83)***			**(14.78)*****			**(9.32)*****
inigrdp	-0.0182	-0.0365	-0.0326				-0.0203	-0.0498	-0.0677
	(-1.23)	(-2.64)***	(-2.37)**				(-0.43)	(-1.59)	(-1.71)*
popgr	-0.0007	0.0001	0.000002	-0.0092	-0.0096	-0.0101	0.0052	-0.0050	-0.0100
	(-0.36)	(0.09)	(0.00)	(-1.31)	(-1.51)	(-1.66)*	(1.16)	(-0.84)	(-1.66)*
invt	0.000004	-0.0005	-0.0005	-0.0012	-0.0013	-0.0016	0.0004	-0.0018	-0.0017
	(0.01)	(-1.13)	(-1.24)	(-1.79)*	(-2.18)**	(-2.78)***	(0.51)	(-1.84)*	(-1.84)*
infl	0.0121	0.0115	0.0116	0.0111	0.0100	0.0100	0.0125	0.0102	0.0107
	(6.84)***	(7.03)***	(7.08)***	(7.16)***	(7.06)***	(7.34)***	(7.91)***	(6.24)***	(6.76)***
gov	-0.0015	-0.0033	-0.0028	-0.0041	-0.0079	-0.0074	-0.0060	-0.0048	-0.0035
	(-1.52)	(-3.53)***	(-3.00)***	(-2.01)**	(-4.12)***	(-4.04)***	(-3.13)***	(-3.01)***	(-2.29)**
edu2	0.0016	-0.0001	0.0005	-0.0051	-0.0053	-0.0053	-0.0068	-0.0026	-0.0033
	(1.78)*	(-0.08)	(0.65)	(-1.97)*	(-2.26)**	(-2.36)**	(-2.6)***	(-1.01)	(-1.43)
central	0.0195	0.0180	0.0206				0.0698	0.0879	0.0588
	(1.18)	(1.2)	(1.36)				(0.87)	(1.59)	(0.96)
western	0.0635	0.0628	0.0693				0.0967	0.1603	0.1175
	(3.02)***	(3.34)***	(3.63)***				(1.8)*	(3.64)***	(2.33)**
constant	0.3043	0.6649	-0.1433	0.6706	0.8212	-0.4204	0.7573	1.0562	0.0972
	(1.89)*	(4.25)***	(-0.93)	(6.57)***	(8.56)***	(-4.48)***	(1.57)	(3.56)***	(0.20)

Empirical results

❖ **Robustness Test**

$$grpgr = f(medium1, small1, inigdp, popgr, invt, infl, gov, edu2, central, western)$$

- Firm variables:
  - Type 1: share of firms by size in total sales in each province
- Estimation Method:
  - Ordinary Least Squares (OLS)
  - Fixed Effects (FE)
  - System GMM

❖ **Medium-sized enterprises versus small enterprises in provincial economic growth**

Model	OLS	Fixed effects	System GMM
medium1	**-0.0022**	**-0.0039**	**-0.0018**
	(-2.24)**	**(-2.54)****	**(-1.02)**
small1	**0.0033**	**0.0054**	**0.0041**
	(4.71)***	**(5.34)*****	**(4.73)*****
inigrdp	-0.0093		-0.1778
	(-0.60)		(-4.08)***
popgr	-0.0017	-0.0061	-0.0261
	(-0.87)	(-0.69)	(-3.93)***
invt	0.0001	-0.0001	0.0001
	(0.25)	(-0.18)	(0.06)
infl	0.0112	0.0107	0.0128
	(5.94)***	(5.31)***	(6.57)***
gov	-0.0011	-0.0023	-0.0026
	(-0.91)	(-0.88)	(-1.58)
edu2	0.0002	-0.0056	-0.0014
	(0.20)	(-1.71)*	(-0.82)
central	0.0178		-0.2043
	(1.01)		(-3.55)***
western	0.0495		-0.0248
	(2.26)**		(-0.63)
constant	0.1491	0.3441	2.0067
	(0.87)	(2.74)***	(4.20)***

Empirical results

- **Some Extensions: Absolute number of firms versus Average size of firms**
- **The Extended Model:**

$$grpgr = f(big3 / medium3 / small3, sales(b / m / s), inigdp, popgr, invt, infl, gov, edu2, central, western)$$

  - Firm variables:
    - Type 3: absolute number of firms in each province
    - Average size of firms in each province (average sales per firm)
  - Estimation Method:
    - Ordinary Least Squares (OLS)
    - Fixed Effects (FE)
    - System GMM

- **The number of firms and their average sizes in economic growth**

Model	OLS			Fixed effects			System GMM		
big3	**-0.0042**			**-0.1189**			**-0.0922**		
	(-0.61)			**(-6.24)*** **			**(-4.73)*** **		
bsales	**0.0278**			**0.0480**			**0.0693**		
	(2.55)**			**(3.44)*** **			**(3.81)*** **		
medium3		**-0.0060**			**-0.1176**			**-0.0192**	
		(-1.16)			**(-5.17)*** **			**(-1.90)***	
msales		**0.0784**			**0.0702**			**0.1761**	
		(6.24)* **			**(3.98)*** **			**(8.29)*** **	
small3			**-0.0014**			**0.0377**			**0.0237**
			(-0.28)			**(1.39)**			**(1.96)****
ssales			**0.0892**			**0.1487**			**0.1746**
			(5.11)* **			**(6.27)*** **			**(6.12)*** **
inigrdp	-0.0299	-0.0584	-0.0469				-0.1202	-0.2891	-0.1933
	(-2.37)**	(-4.62)***	(-3.75)**				(-5.04)***	(-7.17)***	(-5.50)***
popgr	-0.0021	-0.0014	-0.0023	-0.0128	-0.0107	-0.0085	-0.0168	-0.0192	-0.0241
	(-0.98)	(-0.74)	(-1.11)	(-1.74)*	(-1.47)	(-1.00)	(-3.52)***	(-3.71)***	(-4.01)***
invt	0.0004	-0.0007	-0.0003	-0.0015	-0.0019	-0.0019	-0.0037	-0.0063	-0.0021
	(0.90)	(-1.56)	(-0.60)	(-2.50)**	(-3.00)***	(-2.43)**	(-4.49)***	(-6.50)***	(-2.27)**
infl	0.0124	0.0120	0.0118	0.0097	0.0091	0.0120	0.0074	0.0076	0.0130
	(6.27)***	(6.61)***	(6.30)***	(5.61)***	(5.20)***	(6.16)***	(3.50)***	(4.16)***	(6.35)***
edu2	0.0014	0.0007	-0.0004	-0.0034	-0.0054	-0.0089	0.0095	0.0027	-0.0103
	(1.41)	(0.84)	(-0.48)	(-1.29)	(-2.02)**	(-2.86)***	(3.49)***	(1.41)	(-3.31)***
central	-0.0130	-0.0022	0.0009				-0.1113	-0.0658	-0.0311
	(-1.04)	(-0.19)	(0.08)				(-3.97)***	(-2.05)**	(-0.94)
constant	-0.0398	-0.2118	-0.3245	0.3069	0.3966	-1.2569	0.6851	1.2280	0.5559
	(-0.23)	(-1.53)	(-2.07)**	(1.20)	(1.35)	(-4.59)***	(5.58)***	(4.04)***	(1.69)*

Summary and Concluding Remarks

- This paper provides some empirical evidence on the linkages between firms of different sizes and economic growth in China. The main findings are as follows:
  - Increasing the share as well as the number of **big businesses** have a significant and negative effect on economic growth.
  - Increasing the share of the **medium-sized firms** have negative or insignificant effect on economic growth in China.
  - **Small firms** have been the engine of growth in China, as increasing their share has been positively associated with economic growth.
  - Increasing not the number but the size of firms matters in China's economic growth.

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Summary and Concluding Remarks

❖ **Implications**

- What we have learned from this regression is that what matters in economic growth is size expansion of more efficient firms, regardless of sizes. In the Chinese context, this is partly happening in the process of dying away of inefficient firms of large size but expansion of survived firms of large size.
- Also, small firms are contributing to growth, not by the increase of their absolute numbers but by the expansion of their average size. This means that fostering the future growth of small firms should be the matter of policy priority.

=>Subsequently, a best scenario would be to enlarge the scale of various size groups of enterprises and to form a dynamic process of growing from small firms to medium enterprises, and from medium firms to big businesses.

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Thanks for your attentions !