

# SME Policy, Financial Structure and Firm Growth: Evidence From Japan

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**ABSTRACT.** This paper investigates the effects of public policy and financial structure on the growth of small and medium enterprises (SMEs). Using a panel data set on SMEs in the Japanese manufacturing industry, we examine whether or not the SME Creative Business Promotion Law (CBPL) and financial structure affect firm growth. It is found that SMEs approved by prefectural governors under this law tend to increase assets. Further, we provide evidence that the CBPL and cash flow have an impact on the growth of younger SMEs.

## 1. Introduction

Encouraging the growth of small businesses has been a matter of concern and interest in most developed economies. It is often argued that small and medium enterprises (SMEs) play a major role as an engine of economic growth and they contribute to social wealth through the creation of new businesses and jobs<sup>1</sup>. For these reasons, governments have recently paid more attention to the role of SMEs. In particular, innovative SMEs with growth potential are seen as pioneers to develop new business fields in stagnated economies.

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It is well-known that the share of economic activity accounted for by SMEs is considerably large in Japan. In fact, small establishments have a relatively large share of employment, compared with other advanced industrial countries such as the United States.<sup>2</sup> Because of the large share of economic activity, it is expected that SMEs contribute to revitalizing the Japanese economy. In recent years, therefore, the Japanese government has reviewed several support programs to foster innovative SMEs under imperfect capital markets. In April 1995, the government enacted the SME Creative Business Promotion Law (hereafter, CBPL) in order to support SMEs that are pioneers in new areas of business through entries, research and development (R&D), and commercialization of research, partly because low entry has been held in Japanese industries after the so-called bubble-economy burst.<sup>3</sup> This law provides support for SMEs seeking to enter new areas of business through start-ups, R&D, and commercialization of products and services. Under the CBPL, subsidies, loans and tax breaks are offered to SMEs engaged in activities in line with R&D and business plans approved by prefectural governors. By supporting innovative activities, it is hoped, SMEs with growth potential will overcome a scale disadvantage and expand their businesses.

The purpose of this paper is to investigate the effects of public policy and financial structure on the growth of SMEs. Encouraging the start of small businesses is an urgent issue in advanced industrial countries, and great attention is paid to public support programs for SMEs. Nevertheless, little is known about the effects of the programs on the performance of SMEs, but it becomes imperative to verify whether public policy for SMEs is effective or not.<sup>4</sup> More specifically, since the CBPL is a

temporary law for 10 years, policy makers and scholars currently pay more attention to the effects of the CBPL on the performance of SMEs in order to review the future public policy for SMEs in Japan.

Furthermore, although previous studies have investigated firm growth, little is known about the growth of SMEs in the Japanese financial situation. Meyer (1998) argued that commercial banks are the single most important source of external credit to small firms, and small businesses tend to rely on banks for their credit needs and other financial services. In Japan, the hierarchical bank structure is established, and small banks, such as credit associations (*shinkin banks*), play a major role in supplying funds to SMEs. While the United States and the United Kingdom have a market-based financial system, Japan has rather a bank-based financial system, along with Germany. Despite close ties between SMEs and banks, it is often said that the so-called credit crunch and credit withdrawal (*kashishiburi* and *kashihagashi*), which mean that banks are reluctant to extending new loan and force firms to withdraw loan, have occurred in Japan since the bubble-economy burst in the early 1990s. In particular, smaller firms tend to suffer from the credit crunch and the credit withdrawal. Whether public support and financial structure significantly affect firm growth in the dismal state of the financial system remains an empirical question, which is the focus of this paper.

The remaining of this paper is as follows. In the second section, we discuss related literature and describe a regression model to estimate the determinants of firm growth. In the third section, we explain our data. In the fourth section, we show empirical results. Finally, in the fifth section, a summary and conclusions are presented.

## 2. Related literature and model

In the last few decades, a number of studies have been devoted to examining the relationship between the growth and size of firms. As a representative study of firm growth, Evans (1987a, b) examined the effects of firm size and age on growth using data on manufacturing firms in the

United States. Although several previous studies had supported Gibrat's law that hypothesizes that growth is independent of size, Evans found that firm growth decreases with firm size and age. After that, subsequent studies have also found that growth is negatively related to firm size.<sup>5</sup>

Evans (1987a, b) proposed a model in which it is assumed that firm growth is a function of firm size and age. However, firm growth is determined not only by firm size and age but also by other firm-specific characteristics. Some empirical studies, therefore, have proposed a model including firm-specific characteristics other than firm size and age. For example, Heshmati (2001) found that the degree of indebtedness positively affects sales growth using data on Swedish micro and small firms. Also, Becchetti and Trovato (2002) examined the effect of external finance on firm growth in the Italian manufacturing industry, apart from the traditional regressors of age and size. Moreover, Elston (2002) provided evidence that cash flow has an impact on the growth of firms listed in the Neuer Markt of Germany, even when controlling for firm size and age.

If all firms were equal to access to capital markets, external funds would provide a perfect substitute for internal capital, which implies that a firm's financial structure is irrelevant to investment and growth. It is often argued, however, that firms face difficulties in financing from external sources due to asymmetric information problems in capital markets. Capital market imperfections, as Stiglitz and Weiss (1981) suggested, give rise to credit rationing, and they create a wedge between the costs of internal and external finance because of the difference of transaction costs. In fact, a number of studies on capital market imperfections have examined the impact of financial constraints on investment decisions and firm growth. Fazzari et al. (1988) argued that financial constraints in capital markets affect investment, and emphasized that the link between financial constraints and investment varies by type of firm.<sup>6</sup>

SMEs – even firms with growth potential – probably find it difficult to raise funds from external sources. As some previous studies (e.g., Fazzari et al., 1988; Audretsch and Elston,

2002) pointed out, financial constraints may be more binding as firm size decreases. If compared with large enterprises, SMEs are more constrained by the availability of internal finance. In fact, some empirical studies (e.g., Chittenden et al., 1996; Becchetti and Trovato, 2002; Carpenter and Petersen, 2002) have indicated that the availability of financial constraints affects small firm growth.<sup>7</sup> Even though smaller firms seek to achieve minimum efficient scale, they are more likely to be unable to obtain sufficient capital from external sources in order to expand their businesses. In particular, under the dismal economic conditions, internal finance may have a greater impact on the growth of SMEs.

Our approach in this paper is to regress firm growth not only on the traditional determinants of age and size but also on other potential determinants associated with financial structure. As already discussed, it is difficult for SMEs to access to capital markets, and financial constraints are more binding for SMEs. Therefore, internal finance plays an important role in achieving the growth of SMEs by overcoming financial constraints. In addition, capital structure is different among SMEs, and leverage may be related to firm growth. In fact, Lang et al. (1996) found that there is a negative relationship between growth and leverage. Moreover, a few firms have already gone public among SMEs, and publicly-held firms tend to more easily access to external funds than privately-held firms.

One of our interests is to examine the effect of the CBPL, which is regarded as a law that supports SMEs with growth potential, on the growth of SMEs. If this law indeed induces the growth of SMEs by overcoming constraints such as liquidity, then the approved firms under the CBPL will be more likely to grow. In this paper, a variable indicating whether to be approved by a prefectural governor is added to our regression model as a potential determinant, in order to verify the effect of the CBPL on the growth of SMEs.

We describe the regression model to estimate the determinants of firm growth. Let  $GROW_{jt}$

denote firm  $j$ 's growth in period  $t$ . In this paper, the model of firm growth is written as follows:

$$\begin{aligned} GROW_{jt} = & \beta_0 + \beta_1 SIZE_{jt-1} + \beta_2 AGE_{jt-1} \\ & + \beta_3 \frac{CF_{jt-1}}{TA_{jt-1}} + \beta_4 \frac{D_{jt-1}}{TA_{jt-1}} \\ & + \beta_5 IPO_{jt} + \beta_6 CBPL_{jt} + \epsilon_{jt}, \end{aligned} \quad (1)$$

where  $\beta_0, \beta_1, \dots, \beta_6$  are parameters to be estimated, and  $\epsilon_{jt}$  is a disturbance term.

Following some previous studies (e.g., Evans, 1987a, b; Liu et al., 1999; Heshmati, 2001),  $GROW_{jt}$  is defined as the difference between the logarithms of firm size in periods  $t$  and  $t-1$ . The variables,  $SIZE_{jt-1}$  and  $AGE_{jt-1}$ , represent firm  $j$ 's size and age in period  $t-1$ , respectively. These variables take a time-lag in order to clarify the causality relationship. In some empirical studies (e.g., Fazzari et al., 1988; Audretsch and Elston, 2002), the proxy for internal finance is measured by cash flow at the previous period, which indicates less financial constraints. Here, the variable,  $CF_{jt-1}/TA_{jt-1}$ , is defined as cash flow normalized by total assets. The proxy for leverage is measured by the debt-asset ratio,  $D_{jt-1}/TA_{jt-1}$ . And,  $IPO_{jt}$  represents whether or not firm  $j$  goes public in period  $t$ . In addition,  $CBPL_{jt}$  is a dummy variable indicating whether firm  $j$  was approved by a prefectural governor under the CBPL in period  $t$ . By estimating its coefficient, we identify the effect of the CBPL on the growth of SMEs in Japan.

Furthermore, we attempt to provide evidence that the CBPL is effective for the growth of younger firms. Although we identify the determinants of firm growth by estimating Equation (1), the effects of the CBPL may be different across firm age. Apparently, SMEs include not only start-ups but also older firms that keep size small for a long period. The utility of small-sized firms for a long period may be different from that of start-ups. Whereas some older firms do not longer seek to expand their businesses, some younger firms face difficulties in expanding their businesses. Rather, the availability of internal finance affects the growth of younger firms, because asymmetric information problems are more severe as firm age decreases. If it is true, more funds and support are required for the

growth of younger firms. In order to explicitly show the impact on small and younger firms, this paper will also provide further evidence whether the growth of younger firms among SMEs is affected by financial structure and the CBPL.

### 3. Data

As already mentioned, SMEs account for a large share of the Japanese economy. Most scholars, however, have devoted to examining the behavior and performance of large enterprises, and previous empirical studies on Japanese firms tend to be restricted to firms listed in stock markets because of data availability. Although data on publicly-held firms are obtainable by widely used databases, the ratio of the number of publicly-held firms is indeed very low among SMEs, partly because the standards in the Japanese stock markets are quite stringent.<sup>8</sup> In practice, most databases do not sufficiently cover data on smaller firms.

In this paper, therefore, we use a newly constructed data set that is provided by the Research Institute of Economy, Trade and Industry (RIETI). Its original database is the *TSR Data Bank Service* compiled by Tokyo Shoko Research Ltd. (TSR) that is a company for credit investigation like the Dun & Bradstreet Co. in the United States. In our understanding, the database produced by a credit investigation company relatively covers smaller firms including privately-held ones among databases on Japanese firms. Further, the data set was matched with a database of the Small and Medium Enterprise Agency, the Ministry of Economy, Trade and Industry, which includes data on when the firm was approved by a prefectural governor under the CBPL.

The data set provides information on the financial statements of firms regarded as SMEs by the Small and Medium Enterprise Basic Law of Japan.<sup>9</sup> The data set covers firms of which financial statements are available during 1994–1999 fiscal years in the original database, *TSR Data Bank Service*. However, the data set does not include firms of which financial statements are available during only a part of the observation period; that is, it becomes a balanced panel data set. In addition, the data set does not

include firms of which accounting periods have been changed during the observation period. On the other hand, the data set does not provide us any information on when the firm goes public, although it includes not only privately-held but also publicly-held firms. Therefore, we use another data source, *Corporate Quarterly Handbook (Kaisha Shikiho)* provided by Toyo Keizai Inc. and the website of *Yahoo Japan, Finance*, in order to verify when the firm goes public.<sup>10</sup>

There are, however, several measurement issues when we use this data set. First, the data set does not include entrants and exits during the observation period. Some previous studies have pointed out that the sample selection bias occurs without exits. However, since the data set does not provide data on exits, we do not take into account the issue of the sample selection bias.<sup>11</sup> Then, the CBPL was enacted to support for innovative SMEs seeking to enter new areas of business. Some SMEs have been approved by prefectural governors, based on their business plans including R&D activities. The purpose of the CBPL is to encourage the innovative activities of SMEs, but we cannot obtain any information on their innovative activities from the data set.

The original database relatively covers data on joint-stock companies (*kabushiki-gaisha*), but it does not sufficiently cover data on sole proprietorships, partnerships (*gomei-gaisha* and *goshi-gaisha*) and private limited companies (*yugen-gaisha*). Therefore, our sample is restricted to joint-stock companies in the data set. In addition, the ratio of the number of firms approved by prefectural governors is higher in the manufacturing industry.<sup>12</sup> Therefore, our sample is restricted to manufacturing firms, which mitigates the issue of heterogeneity due to different market structure between manufacturing and non-manufacturing sectors. Furthermore, since we use information on financial statements during 1994–1999 fiscal years, firms founded on or after 1994 fiscal year are excluded from our sample. As a result, the sample used in this paper consists of joint-stock companies, which are regarded as SMEs and have been founded on or before 1993 fiscal year, in the Japanese manufacturing industry.<sup>13</sup>

In the previous studies of firm growth, employment growth has often been used as a

growth measure. Evans (1987a, b), for example, measured firm growth by employment. From the viewpoint of the government hoping the creation of employment, this measure is more suitable, but apparently firms themselves do not seek only employment growth. On the other hand, Lang et al. (1996) attempted to use three measures: net investment, capital expenditure growth and employment growth. In addition, Heshmati (2001) examined the growth of small firms using three measures: employment growth, assets growth and sales growth. The findings of these previous studies implicated that the determinants of firm growth are sensitive with respect to its definition. By using obtainable data, in this paper, firm growth is measured by three variables: employment, assets and sales growth.<sup>14</sup>

The dependent variable for firm growth, *EGROW*, is defined as the difference between the logarithms of the number of employees in periods  $t$  and  $t-1$ . Similarly, the dependent variables, *AGROW* and *SGROW*, are defined as the difference between the logarithms of the book values of tangible fixed assets other than land, and the difference between the logarithms of sales, respectively. In accordance with the dependent variables, we use variables for firm size, *ESIZE*, *ASIZE* and *SSIZE*, which are

defined as the logarithms of the numbers of employees, tangible fixed assets other than land, and sales. Table I presents the definitions of variables in Equation (1).

#### 4. Empirical results

The number of firms is 6961 in the sample and the observation period is 1995–1999 fiscal year.<sup>15</sup> The sample consists of panel data. Totally, we obtain 34,805 observations. Among the 6961 firms, 227 firms have been approved by prefectural governors under the CBPL during the observation period.

As mentioned earlier, in order to explicitly show the impact of public policy and financial structure on younger firms, the sample is divided into two subsamples, namely younger and older SMEs.<sup>16</sup> Whereas the company entry rate has been about 10% and more during Japan's postwar economic growth, a downstream trend is seen on or after 1974, corresponding to the first oil shock.<sup>17</sup> In this paper, older SMEs are defined as firms founded before 1974 fiscal year, and younger SMEs are defined as those founded from 1974 fiscal year to 1993 fiscal year, that is, the last two decades. As a result, the numbers of younger and older SMEs are 1131 and 5830, respectively.

TABLE I  
Variable definitions

Variable	Definition
Dependent variable	
<i>EGROW</i>	Difference between the logarithms of the numbers of employees.
<i>AGROW</i>	Difference between the logarithms of the book values of tangible fixed assets other than land.
<i>SGROW</i>	Difference between the logarithms of sales.
Independent variable	
<i>ESIZE</i>	Logarithm of the number of employees.
<i>ASIZE</i>	Logarithm of the book value of tangible assets other than land.
<i>SSIZE</i>	Logarithm of sales.
<i>AGE</i>	Logarithm of firm age.
<i>CF/TA</i>	Ordinary profits plus depreciation divided by total assets.
<i>D/TA</i>	Debt divided by total assets.
<i>IPO</i>	Dummy variable for the firm gone public.
<i>CBPL</i>	Dummy variable for the firm approved by a prefectural governor under the CBPL.

*Note:* All monetary values (thousands of yen) are transformed into the prices in 1995 fiscal year by using the GDE deflators provided by the Economic and Social Research Institute, Cabinet Office. The dummy variable takes a value of one if the stated condition holds, and zero otherwise.

TABLE II  
Descriptive statistics

	Mean	S.D.	Minimum	Maximum
<i>EGROW</i>	-0.019	0.121	-3.418	3.570
<i>AGROW</i>	-0.007	0.209	-6.492	4.536
<i>SGROW</i>	-0.013	0.149	-3.940	4.181
<i>ESIZE</i>	4.310	0.941	0.000	8.160
<i>ASIZE</i>	12.677	1.407	4.007	18.639
<i>SSIZE</i>	14.638	1.080	10.296	18.527
<i>AGE</i>	3.492	0.479	0.000	4.691
<i>CF/TA</i>	0.049	0.414	-1.034	76.395
<i>D/TA</i>	0.743	0.235	0.039	4.837
<i>IPO</i>	0.055	0.227	0.000	1.000
<i>CBPL</i>	0.016	0.126	0.000	1.000

Note: S.D. indicates standard deviation. The number of observations is 34,805.

TABLE III  
Descriptive statistics: younger and older SMEs

	Younger SMEs		Older SMEs	
	Mean	S.D.	Mean	S.D.
<i>EGROW</i>	0.0005	0.161	-0.023	0.111
<i>AGROW</i>	0.011	0.284	-0.011	0.191
<i>SGROW</i>	0.006	0.200	-0.016	0.137
<i>ESIZE</i>	3.732	1.007	4.422	0.885
<i>ASIZE</i>	11.847	1.596	12.837	1.308
<i>SSIZE</i>	14.072	1.126	14.748	1.035
<i>CF/TA</i>	0.054	0.069	0.048	0.451
<i>D/TA</i>	0.804	0.228	0.731	0.235
<i>IPO</i>	0.024	0.153	0.060	0.238
<i>CBPL</i>	0.030	0.171	0.013	0.115
<i>n</i>	5655		29,150	

Note: S.D. indicates standard deviation. *n* indicates the number of observations.

Table II shows the descriptive statistics of the variables. Table A1 presents the correlation matrix of the independent variables in Appendix. All monetary values are transformed into the prices in 1995 fiscal year by using the gross domestic expenditure (GDE) deflators provided by the Economic and Social Research Institute, Cabinet Office. In Table II, the means of *EGROW*, *AGROW* and *SGROW* are about -1.9, -0.7 and -1.3%, respectively. On average, firm growth decreases regardless of the growth measure used, which appears to correspond to the recent stagnated Japanese economy. In addition, Table III shows the means and standard deviations of the variables for younger and

older SMEs, respectively. In Table III, the growth of younger SMEs is on average higher than that of older SMEs.

Table IV shows empirical results in three growth models: employment, assets and sales. In Table IV, we estimate parameters using the within estimator – also known as the fixed-effects estimator.<sup>18</sup> In the panel data estimation, year dummies are used to control the difference due to macro-economic conditions. As is shown in Table A1, there seems to be a positive correlation between firm size and age. In addition, since *AGE* is a firm-specific incremental variable, collinearity problems may occur between *AGE* and a set of year dummies in the within

TABLE IV  
Empirical results: employment, assets and sales growth models

	Employment		Assets		Sales	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
<i>ESIZE</i>	-0.369*** (0.025)	-0.394*** (0.025)				
<i>ASIZE</i>			-0.387*** (0.014)	-0.391*** (0.014)		
<i>SSIZE</i>					-0.444*** (0.020)	-0.454*** (0.021)
<i>AGE</i>	-0.201*** (0.014)		-0.182*** (0.028)		-0.393*** (0.018)	
<i>CF/TA</i>	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)	0.001 (0.001)	-0.0007 (0.0007)	-0.001* (0.0006)
<i>D/TA</i>	-0.088*** (0.021)	-0.114*** (0.021)	-0.131** (0.060)	-0.154** (0.060)	-0.121*** (0.026)	0.087*** (0.025)
<i>IPO</i>	-0.003 (0.021)	0.009 (0.021)	0.041 (0.029)	0.046 (0.029)	0.025 (0.019)	0.036* (0.019)
<i>CBPL</i>	0.003 (0.007)	0.007 (0.007)	0.033** (0.013)	0.034** (0.013)	-0.010 (0.011)	-0.004 (0.010)
Year dummies	No	Yes	No	Yes	No	Yes
<i>n</i>	34,805	34,805	34,805	34,805	34,805	34,805
$\bar{R}^2$	0.228	0.248	0.250	0.258	0.235	0.305

Note: Figures in parentheses are standard errors due to White's (1980) heteroscedastic-consistent estimator. *n* indicates the number of observations. \*\*\*, \*\* and \* indicate significance at the 1%, 5% and 10% level, respectively.

estimator. Therefore, we estimate the regression model not only with *AGE* but also with year dummies instead of *AGE* in each growth model. In all the regression models, we use White's (1980) heteroscedastic-consistent estimator.

First, the coefficients of *SIZE* are negative and significant in the employment, assets and sales growth models.<sup>19</sup> The estimated results are almost consistent with those of recent studies that show a negative relationship between firm growth and size. On the other hand, the coefficients of *AGE* are negative in all the growth models. The results suggest that younger firms are more likely to grow faster than older ones, which is consistent with Jovanovic's (1982) learning model. On the whole, the evidence shows that smaller firms are more likely to grow, suggesting that Gibrat's law does not hold for Japanese manufacturing SMEs.

Then, with respect to financial structure, the coefficients of *CF/TA* are positive in the employment and assets growth models, but they are not significant. Although Lang et al. (1996) found that firms with cash flow are more likely to grow, we cannot find any evidence that cash

flow significantly affects the growth of SMEs. On the other hand, Audretsch and Elston (2002) revealed an interesting finding that medium-sized firms appear to be more financial constraints using data on German firms, and Elston (2002) argued that financial constraints in the old German economy do not appear to be binding. Whereas it is not found that cash flow is significantly related to firm growth in Table IV, it might be predicted that internal finance has less influence on firm growth, particularly of older SMEs that have already passed the early stages after establishment. Rather, internal finance may have more influence on the growth of younger SMEs, which will be discussed later.

On the other hand, it is found that there is a significantly negative relationship between firm growth and the debt-asset ratio in the employment and assets growth models. The results agree with those of Lang et al. (1996) in which a negative relationship is held between firm growth and leverage. Our findings suggest that SMEs rely heavily on internal investment sources for employment and assets growth.

Although, as is often argued, firms employ leverage as the means of expanding firm size, indeed it seems to be difficult for SMEs with high debt-ratio to raise more funds from external sources. By contrast, it is found that the debt-asset ratio has a positive effect on sales growth. These results in the assets and sales growth models are almost consistent with those of Heshmati (2001).<sup>20</sup> The results may imply that firms with proper growth opportunities may be able to utilize leverage to expand their sales, even though they do not raise capital.

Moreover, the coefficients of *IPO* are positive in the assets and sales growth models, but the results are not sufficiently significant. As already mentioned, it is well-known that the standards in the Japanese stock markets are quite stringent and, hence, initial public offerings (IPO) may generate reputation effects that induce more funds and sales. On the other hand, firms lose growth opportunities as firms age, according to Jovanovic's (1982) learning model. Since publicly-held firms have already passed a growing stage, we may not obtain significant results.<sup>21</sup>

Furthermore, with respect to the effect of the CBPL on firm growth, the coefficient of *CBPL* is positive and significant only in the assets growth model. In this paper, it is found that the CBPL is associated with assets growth, but employment and sales growth is not strongly sensitive to this law. The results may imply that the approved SMEs under the CBPL increase investment for assets through subsidies, loans and tax breaks, but that does not yet lead to employment and sales growth. Even if public policy has an effect on the performance of firms, there may be a time-lag until its effect is seen. The CBPL was enacted in 1995, and future research will be required to estimate the time-lag.<sup>22</sup>

As already mentioned, in order to explicitly show the impact of public policy and financial structure on younger firms, we examine the difference between younger and older SMEs by employing the regression models presented in columns (ii), (iv) and (vi) of Table IV. Table V shows the empirical results of the employment, assets and sales growth models for younger and older SMEs, respectively. In Table V, we obtain

TABLE V  
Empirical results: employment, assets and sales growth models for younger and older SMEs

	Employment		Assets		Sales	
	Younger SMEs	Older SMEs	Younger SMEs	Older SMEs	Younger SMEs	Older SMEs
<i>ESIZE</i>	-0.445*** (0.070)	-0.378*** (0.020)				
<i>ASIZE</i>			-0.397*** (0.028)	-0.389*** (0.016)		
<i>SSIZE</i>					-0.518*** (0.069)	-0.435*** (0.013)
<i>CF/TA</i>	0.246*** (0.052)	0.001 (0.001)	0.247*** (0.090)	0.0005 (0.0008)	0.128 (0.116)	-0.001** (0.0006)
<i>D/TA</i>	-0.003 (0.036)	-0.134*** (0.025)	-0.095 (0.071)	-0.159** (0.075)	0.091* (0.055)	0.091*** (0.029)
<i>IPO</i>	-0.029 (0.051)	0.030** (0.015)	0.047 (0.063)	0.044 (0.029)	0.0004 (0.032)	0.054** (0.023)
<i>CBPL</i>	0.047*** (0.018)	-0.010 (0.007)	0.085*** (0.033)	0.014 (0.014)	0.039 (0.024)	-0.021** (0.011)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
<i>n</i>	5655	29,150	5655	29,150	5655	29,150
$\bar{R}^2$	0.259	0.243	0.295	0.241	0.299	0.306
$\chi^2$ (d.f. = 5)	39.168***		11.400**		9.570*	

Note: Standard errors in parentheses. *n* indicates the number of observations. \*\*\*, \*\* and \* indicate significance at the 1, 5 and 10% level, respectively.  $\chi^2 = (\hat{\beta}_y - \hat{\beta}_o)^T (\hat{V}_y + \hat{V}_o)^{-1} (\hat{\beta}_y - \hat{\beta}_o)$  where  $\hat{\beta}_y$  and  $\hat{\beta}_o$  are the estimated coefficients vectors for younger and older SMEs, and  $\hat{V}_y$  and  $\hat{V}_o$  are their variance-covariance matrices, respectively.



remarkably different results from those of Table IV.

First, the coefficients of  $CF/TA$  are positive and significant for younger SMEs in the employment and assets models, while they are insignificant for older ones. The results suggest that cash flow is more sensitive to the growth of younger SMEs, which is almost consistent with the results of Elston (2002). As already mentioned, perhaps it is difficult for younger SMEs to obtain sufficient funds from capital markets because of information asymmetry and, hence, younger firms with internal finance are more likely to grow, compared with older ones. In the previous literature, Carpenter and Petersen (2002) provided evidence that the growth of smaller firms is constrained by the availability of internal finance. Our findings bring further evidence that the availability of internal finance has an impact on firm growth – particularly of younger firms.<sup>23</sup>

Then, the coefficients of  $CBPL$  are positive for younger SMEs in all the growth models, but the effect of  $CBPL$  is insignificant in the sales growth model. On the other hand, it is not found that the  $CBPL$  affects the growth of older SMEs. The results indicate that younger SMEs approved by prefectural governors under the  $CBPL$  are more likely to grow. Although the  $CBPL$  was indeed enacted to support SMEs without firm age, the law exerts younger firms to achieve firm growth rather than older ones. Most of younger SMEs are at the early stages of firm life cycle, and they tend to have more restricted access to capital markets due to information asymmetry. Financial constraints affect the growth of younger SMEs, and the  $CBPL$  is more effective to induce their growth. These results implicate that rather SME support programs are needed for younger firms with growth potential in the early stages.

## 5. Conclusions

This paper investigated the effects of public policy and financial structure on the growth of SMEs. Using a panel data set on SMEs in the Japanese manufacturing industry, we examined whether or not the  $CBPL$  and financial structure affect firm growth. It was found that SMEs

approved by prefectural governors under this law tend to increase assets. Further, we provided evidence that the  $CBPL$  and cash flow have an impact on the growth of younger SMEs.

Recently, some support programs for new businesses and several stock markets for new ventures have been introduced in Japan, and one can see the trend toward the improvement of environment for innovative start-ups. Our findings indicate that public policy and capital markets exert an influence on firm growth, particularly of younger SMEs. It is expected that the improvement of environment for younger SMEs creates innovative start-ups and entrepreneurs that stimulate economic growth. Of course, excess support without proper evaluation loses the resource of competitiveness and may result in increasing moral hazard. Further research on how to evaluate the activities will be required to foster innovative SMEs that produce spillover effects.

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## Appendix

TABLE A1  
Correlation matrix of independent variables – all sample

	<i>ESIZE</i>	<i>ASIZE</i>	<i>SSIZE</i>	<i>AGE</i>	<i>CF/TA</i>	<i>D/TA</i>	<i>IPO</i>	<i>CBPL</i>
<i>ESIZE</i>	1.000							
<i>ASIZE</i>	0.751	1.000						
<i>SSIZE</i>	0.826	0.744	1.000					
<i>AGE</i>	0.370	0.349	0.328	1.000				
<i>CF/TA</i>	0.013	0.018	0.016	-0.015	1.000			
<i>D/TA</i>	-0.119	-0.082	-0.105	-0.134	-0.043	1.000		
<i>IPO</i>	0.237	0.266	0.282	0.152	0.003	-0.193	1.000	
<i>CBPL</i>	0.004	-0.006	-0.025	-0.035	-0.003	-0.034	-0.015	1.000

## Notes

<sup>1</sup> For more discussion on the role of small firms, see, for example, Acs and Audretsch (1990, 1993) and Storey (1994).

<sup>2</sup> For an international comparison of employment shares of SMEs, see Loveman and Sengenberger (1991).

<sup>3</sup> Correctly, the SME Creative Business Promotion Law is called the Temporary Law Concerning Measures for the Promotion of the Creative Business Activities of SMEs. Whereas the previous policy on SMEs stated that the mission was to rectify the gap between large enterprises and SMEs, the recent policy appears to be shifted from protecting disadvantaged SMEs to fostering growth-oriented innovative ones. As Eshima (2003) argued, this law seems to be a symbolic sign of a shift in Japanese government policy on SMEs.

<sup>4</sup> There are a few exceptions that empirically examine the effects of public policy on the performance of SMEs. Audretsch et al. (2002), for example, evaluated public support of private-sector R&D through the Department of Defense's, Small Business Innovation Research (SBIR) Program of the United States. In Japan, Eshima (2003) evaluated the CBPL by using two matched samples of firms. In addition, Harada and Honjo (2005) attempt to examine the impact of the CBPL on the investment behavior of SMEs.

<sup>5</sup> See, for example, Hall (1987), Dunne et al. (1989), Harhoff et al. (1998), Audretsch et al. (1999), Liu et al. (1999), Honjo (2004) and Yasuda (2004). This negative relationship is often explained by Jovanovic's (1982) learning model. For more discussion on Gibrat's law, see Sutton (1997).

<sup>6</sup> Bond and Meghir (1994) showed the excess sensitivity of investment to a measure of cash flow by using the Euler equation approach. For a review of capital market imperfections, see Hubbard (1998).

<sup>7</sup> For more discussion on small firm financing, see, for example, Petersen and Rajan (1994).

<sup>8</sup> For example, Nikkei Economic Electronic Databank System (NEEDS), which is one of the most widely used databases, provides the financial statements of Japanese firms, but it does not sufficiently cover data on smaller

firms. On the other hand, National Life Finance Co., which is a government financial institution for SMEs and individuals, has an original database on Japanese firms including smaller ones, but the data are restricted to firms financed by the institution.

<sup>9</sup> Under the Small and Medium Enterprise Basic Law of Japan, the term 'small and medium enterprise (SME)' refers in general to enterprises with capital stock of not in excess of 300 million yen or 300 or fewer regular employees, and sole proprietorships with 300 or fewer employees in the manufacturing industry. According to this definition, the data set was extracted from the *TSR Data Bank Service*. Note that the data set was compiled by TSR in December 2001. Therefore, whether the firms are regarded as SMEs is based on the date.

<sup>10</sup> *Yahoo Japan, Finance* <http://quote.yahoo.co.jp/>

<sup>11</sup> Even if we obtain data on exits, we face difficulties in estimating parameters. As the estimation method, some studies attempted to use the sample selection model including Heckman's (1976, 1979) two-step estimation method, by using two regression equations for growth and survival. More recent studies (e.g., Leung and Yu, 1996) argued, however, that the sample selection model is susceptible to collinearity problems. In particular, Puhani (2000) showed that the subsample ordinary least squares method (OLS) performs better than the sample selection model if collinearity problems between two regression equations are present.

<sup>12</sup> According to the Research Institute of Economy, Trade and Industry (2002), 8094 firms have been approved by the CBPL until October 2001. The number of the manufacturing firms was 4855 and its ratio was about 60%.

<sup>13</sup> The data on financial statements, such as assets and sales, are based on firms' accounting periods that vary across firms. By assuming that financial statements proportionally vary every month, therefore, all the data are standardized according to the Japanese fiscal year; that is, the data are transformed into the values from April to March.

<sup>14</sup> In this paper, assets growth is measured on the basis of the book values of assets. Although the book values of assets of older firms tend to deviate from their market values, it is cumbersome to measure the market values of assets.

<sup>15</sup> There are only a few firms of which tangible fixed assets other than land are zero, and these firms are excluded from the sample.

<sup>16</sup> Some previous studies have attempted to provide evidence that a group of firms is more likely to face financial constraints, by dividing the sample into several subsamples. For example, Elston (2002) argued that financial constraints are binding for new economy firms that tend to include younger firms, by dividing her sample into new and old German economy firms. See also Becchetti and Trovato (2002), and Carpenter and Petersen (2002).

<sup>17</sup> For the trend of the entry rate, see Figure 2-1-23 of the Small and Medium Enterprise Agency (2002).

<sup>18</sup> We also estimated parameters using the generalized least squares (GLS) estimator – also known as the random-effects estimator. Then, we attempted Hausman's (1978) test to specify which estimator should be used. Consequently, the null hypothesis that guarantees the GLS estimator to be efficient is rejected at the 1% significance level in each growth model. Thus, we report only the within estimator, since the GLS estimator is shown to be inconsistent. As Liu et al. (1999) pointed out, that may imply that firm-specific factors, which are correlated to the independent variables, are important as the determinants of firm growth.

<sup>19</sup> Following some previous studies (e.g., Evans, 1987a, b; Heshmati, 2001), we also estimated the regression models that include the quadratic terms of firm size. We found a significantly positive sign of the quadratic term in the employment growth model, but the coefficients of the quadratic terms were not significant in the assets and sales growth models.

<sup>20</sup> Lang et al. (1996) found that the negative relationship between growth and leverage holds for firms with low Tobin's  $q$ , but not with high Tobin's  $q$ .

<sup>21</sup> As is shown in Table A1, *IPO* tends to be positively correlated to firm size. Therefore, we estimated the regression models without the variables for firm size, but we could not obtain more significant results.

<sup>22</sup> We attempted to use the variable for the CBPL with 1-year and more lags, but we could not obtain more significant results.

<sup>23</sup> On the other hand, cash flow is often regarded as investment opportunities. Therefore, the results may also indicate that firms with investment opportunities are more likely to grow among younger SMEs. In some previous studies (e.g., Lang et al., 1996; Carpenter and Petersen, 2002), Tobin's  $q$  has been used as a proxy to control investment demand. However, we do not use the variable for Tobin's  $q$ , since most SMEs in Japan are privately-held firms and it is difficult to measure their market values.

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