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The Effect of Bank Competition on Firm Entry, Growth, and Exit: Evidence from Japanese Industry Data

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The Effect of Bank Competition on Firm Entry, Growth, and Exit: Evidence from Japanese Industry Data[*]

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Abstract

This paper empirically investigates the effects of bank competition in the financial sector on the creation, growth, and destruction of establishments in the local Japanese market. It is found that concentration in the banking sector negatively (positively) affects the creation (destruction) and average size of establishments in industries that have greater dependence on external financing and a greater value of intangible fixed assets. These results suggest that in concentrated banking markets, potential entrants are more likely to face difficulty in obtaining credits, less likely to grow, and more likely to exit as compared with competitive banking markets.

Keywords: Bank Market Power, Small Business Financing, Asymmetric Information, Firm Dynamics

JEL Classification: D4, G21, L11

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1 Introduction

Small- and medium-sized firms are a key engine for growth of economies. Policies boosting the entry of new firms can make an important contribution for stimulating growth. In fact, some local governments set numerical targets for start-up rates to stimulate growth. A growing number of empirical studies explore factors affecting start-up activities and growth of local economies. Most of these empirical studies are based on traditional industrial organization theory, which has found that demand for goods and services, industry agglomeration, human resources, and industry entry barriers have affected the star-up ratios and industrial growth in local markets. On the other hand, some recent studies found that competition not only in goods markets but also in local financial markets has affected firm entry and the distribution of firm size in local economies. (Cetorelli and Gambera 2001; Cetorelli and Strahan 2006). Informational asymmetry may explain differences in these factors.

In the absence of informational asymmetry problems between lenders and borrowers, new entrants are able to gain finance for their projects at lower costs in competitive financial markets than in less competitive markets. This leads to more new firm entries in the competitive financial market. In the presence of informational asymmetry, however, entrepreneurs encounter difficulties in obtaining credit. Theories on banking explain that long-term exclusive banking relationships can relax credit constraints on start-up firms. In other words, in the presence of

informational asymmetry, firms' availability of credit differs within the same market, depending upon whether they have a banking relationship or not.

This study investigates the effects of interbank competition on firm entry, growth, and exit in local credit markets. The analysis here differs from preceding studies in three ways. First, this study examines the effect of bank competition on not only firm entry and growth but also firm exit in Japan, whereas most preceding analyses have investigated that on firm entry and growth in the U.S. and Italy but not in Japan. Moreover, few studies have explored the effect of inter-bank competition on firm exit. Second, most previous studies limit their analysis to the manufacturing sector, despite the fact that start-up rates in mature economies such as the U.S. and Japan are higher in non-manufacturing sectors than in manufacturing sectors.[1,2] Moreover, informational asymmetric problems are more severe in non-manufacturing sectors since firms in those sectors have fewer tangible fixed assets (or collateral) that can serve as incentives for deterring moral hazard and adverse selection problems. This study expands this analysis to whole industries. Third, this study investigates the effects of bank competition on firm entry

[1] An exception is Bonaccorsi Di Patti and Dell' Ariccia (2004). They used data on start-up rates for the 22 industries including some non-manufacturing sectors in Italy.
[2] According to the *Establishment and Enterprise Census* issued by the Ministry of Internal Affairs and Communications conducted in year 2006, industries with most new entry of establishments were wholesale and retail trade, followed by services, eating and drinking places, and accommodations. The share of new establishments in the manufacturing sector is only 5.5%. Industries with the most start-up rates were compound services (the start-up rate is 71.3%), followed by information and communications (49.96%), and medical, health care, and welfare (39.5%). On the other hand, the start-up rate of manufacturing is 11.6%.

(exit) and growth using aggregated census data at an industry and prefecture level. Since we use aggregated data, it is difficult to test how competition among banks operating in a local market affects firms' banking relationships. However, the advantage of using census data is that we can explore the effects of bank competition on the number of new (exiting) establishments, on start-up (exit) rates, and on the distribution of establishment sizes. This enables us to capture the impact of interbank competition on the industrial organizational structure of a local economy. It is fairly difficult to obtain data on small- and medium-sized enterprises (SMEs) in Japan. Even if such data is available, the sample size is extremely small and coverage is limited to relatively to that of larger SMEs. Moreover, data collected by survey questionnaire has disadvantages such as potential in recognizing individual respondent firms as representatives of the local market. Data used in this study is census data that includes all small establishments.

The remainder of the paper is organized as follows. Section 2 reviews previous theoretical and empirical studies and presents hypotheses testing. Section 3 describes our sample data and the basic estimation strategy. Section 4 presents the results of the estimation of the effects of interbank competition on the number of new establishments, on start-up (exit) rates and on the distribution size of establishments in local markets. It interprets the results by comparing them to preceding studies. The summary and conclusions are presented in Section 5.

2 The effect of interbank competition on firm entry and growth: Theory and evidence

This section presents the theoretical literature on the effects of bank competition on firm entry and size. In addition, it discusses previous empirical studies on these issues. From a theoretical perspective, bank competition can have both positive and negative effects on firm creation. Industrial organization theory says that, in general, bank market power reduces credit availability for firms. Thus, a negative relationship between the number of new establishments (or firm size) and bank concentration in a local market is expected.

On the other hand, bank concentration in local markets disproportionately affects credit availability of firms where informational asymmetry between borrowers and lenders exists. It is well known that informationally opaque SMEs are more likely to encounter credit rationing. This is a problem that can be overcome through banking relationships, which, over time, help the bank to obtain information on the borrowing firm's unobservable qualities and thus, mitigate credit rationing. The benefit of a long-term exclusive banking relationship is that it enables banks to internalize the cost of soft-information gathering. Additionally, it enables firms to offer their private information to the bank without revealing it to rival firms. On the other hand, such relationships potentially allow banks to extract rent by exploiting the informational monopoly power they possess over a firm (Sharpe 1990; Rajan 1992; von Thadden 1995). In this environment, small- and medium-sized firms that heavily rely on bank finance can protect

themselves from this hold-up problem by establishing a second banking relationship or by switching banks. When local credit markets are competitive, firms more easily find other sources of financing after they grow. Thus, banks are discouraged from investing in relationship lending in competitive financial markets. On the other hand, in concentrated markets, a firm's costs of switching to a new bank are relatively high. In other words, banks are more likely to finance start-up firms because they can expect to gain from rent exploitation by charging higher interest rates on loans once these firms grow. Therefore, start-up rates are expected to be higher in concentrated financial markets. On the other hand, firm size is relatively small in concentrated markets because firm growth is hampered by the hold-up problem.

On the other hand, Boot and Thakor (2000) predict a positive correlation between bank competition and relationship lending. They argue theoretically that as bank competition increases, banks make more relational loans than transaction loans. Since relational loans are relationship-specific, sector-specialized credit, they are less likely to be affected by bank competition than are transaction loans. Thus, a positive relationship is expected between bank competition and firm entry. On the other hand, bank competition is expected to have both positive and negative effects on firm growth. A negative effect is due to hold-up problems. Relationship banking is expected to have a positive effect on firm growth when hold-up problems are mitigated by increased bank competition. Boot and Thakor (2000) argue that even

though interbank competition may lead to more relationship lending, the profitability of this type of lending is reduced because of interbank competition. Thus, banks' monitoring efforts, which in turn improve a firm's performance, are expected to decline. This leads to fewer hold-up problems. At the same time, firms can easily find other financing sources in competitive bank markets. Therefore, banks in competitive markets will most likely commit themselves to not extracting rents to preserve their reputations and potential clients. In such cases, it is not always true that relationship banking entails hold-up problems. Thus, firm growth is expected to be high in competitive banking markets.

The empirical literature has produced mixed results regarding the effects of interbank competition on firm entry and growth. For example, using U.S. small firm data, Petersen and Rajan (1994, 1995) find that a higher concentration in local credit market leads to less credit rationing for young firms. Zarutskie (2006), using panel data for U.S. firms, finds that younger firms are less capable of obtaining credit after a regulation to limit interbank competition in local credit markets is lifted. These studies suggest that interbank competition leads to less credit for young firms. Ogura (2007), using survey data for 1500 SMEs in Japan, finds that relationship banking has a positive effect on credit availability for start-up firms. Moreover, he finds a negative relationship between interbank competition and relationship banking. Bonaccorsi Di Patti and Dell'Ariccia (2004), using aggregated data of industry by geographic

location in Italy, find a nonlinear relationship between interbank competition and start-up rates. Moreover, they find that start-up rates decline in more informationally opaque industries as interbank competition increases. These studies suggest that firm entry is more observed in concentrated bank markets.

On the other hand, Cetorelli and Strahan (2006), using aggregated data at an industry and state level in the U.S., find that interbank competition increases the total number of establishments and reduces the size of typical establishments in bank-dependent industries. These results suggest that smaller firms are credit rationed in concentrated banking markets. Black and Strahan (2002), using an aggregated panel data at a state level, find a positive relationship between the number of start-up firms and interbank competition. Shikimi (2013), using data on SMEs in Japan, finds a positive relationship between the credit availability of firms and interbank competition in local financial markets. These studies suggest a positive relationship between firm entry and interbank competition in local credit markets.

However, interbank competition has conflicting implications with regard to firm growth. Fernández de Guevara and Maudos (2009), using data on Spanish firms, find a U-shaped relationship between firm growth and interbank competition in local financial markets. Cetorelli and Gambera (2001), using international data at an industry level, find an inversely U-shaped relationship between industrial growth and an interaction term of concentration in the banking

sector and industry's financial dependency. They interpret these results to show that industries more dependent on bank financing reap the benefits of relationship banking from concentrated banking markets, while industries less dependent on bank financing can reap the benefits of bank competition. On the other hand, Claessens and Laeven (2005) find higher growth in industries with a greater dependence on external finance as bank competition increases.

Other studies argue that bank competition has no effect on firms' survival rates or firm growth. Okamuro (2007), using survey data for 2100 start-up firms in Japan, finds that local credit market conditions have little effect on firm survival rates and firm growth.

Studies using aggregated data at an industry and regional level test whether the effect of bank competition on firm entry and growth varies according to the level of a sector's dependence on external financing and on the degree of informational opaqueness. Most previous studies assume that industries with a higher dependence on external finance are informationally opaque and more likely to be affected by interbank competition. However, firms' sources of external financing are not limited to bank loans; stock issues and public debt are other viable options. Only those firms who encounter difficulties in financing from capital markets because of asymmetric information problems turn to bank loan financing. Most previous studies use firm size, firm age, and the value of a firm's intangible assets ratio as proxies for informational asymmetries. In general, these studies show a positive correlation between a firm's bank loan

ratio and the value of its collateral. Firm-specific assets, such as intangible fixed assets, are considered difficult to evaluate and are not, generally, accepted as collateral. Thus, a high value of intangible asset ratio does not always reflect a firm's dependency on bank financing. In other words, a firm's bank loan dependence does not always reflect its degree of informational opaqueness.

There are two types of bank lending: relationship lending and transaction lending. In the former type of lending, banks use both a firm's soft and hard information when deciding to extend a loan, whereas in the latter case they mostly rely on a firm's hard information to make these credit decisions. Therefore, firms more dependent on bank loans are not always the informationally opaque firms that rely heavily on relationship lending. Considering such cases, this study focuses on informationally opaque industries with a higher dependence on external financing. We assume the effect of interbank competition varies according to an industry's dependence on external financing and to the degree of the industry's informational opaqueness.

As to firm exit, there are few theoretical or empirical studies on the effects of interbank competition on firm exit. If the relationship banking alleviates the credit constraints of firms which are temporally shortage of liquidity and hence avoid inefficient corporate failures, it is expected the same mechanism will work for firm exit.

The theoretical literature and previous empirical studies on the effects of interbank

competition on firm creation and growth can be summarized in the following partly conflicting hypotheses:

H1: Concentration in bank financing leads to an increase in relationship lending. Thus, concentration in bank financing markets has a positive (negative) effect on start-up (exit) rates of external-finance dependent industries with more informational asymmetry, and a negative effect on establishment size in those industries due to hold-up problems (Petersen and Rajan 1994, 1995; Bonaccorsi Di Patti and Dell'Ariccia 2004).

H2: Interbank competition leads to an increase in relationship lending (Boot and Thakor 2000). Thus, increased concentration in banking sectors has a negative (positive) effect on start-up (exit) rates in industries with more informational asymmetry, and has a positive effect on the size of establishments in those industries.

H3: Interbank competition leads to an increase in relationship lending (Boot and Thakor 2000). Thus, an increase in interbank competition has a positive (negative) effect on the start-up (exit) rates of establishments in industries with more informational asymmetry. Additionally, it has a positive effect on the size of establishments in those industries because hold-up problems are mitigated due to a decline in the costs incurred by firms from switching to other banks (Claessens and Laeven 2005).

3 Econometric procedure and Data

3.1 Econometric procedure

This section analyzes the effect of interbank competition in local financial markets on start-up (exit) rates and the size of establishments. The creation (destruction) and growth of establishments are determined by the degree of interbank competition in local financial markets, by the level of an industry's maturity, and by other factors. It is possible that interbank competition does not always has a homogenous effect on the creation (destruction) and growth of establishments; instead it has a heterogeneous effect according to the degree of external financial dependence of industries and to the level of their informational asymmetry.

The baseline empirical model can be written as follows[3]:

$$Y_{jpt} = \alpha_1 + \beta_1 \cdot (Dependence_j \cdot Concentration_{pt}) + \gamma_1 \cdot Concentration_{pt} + \delta_1 \cdot Share_{jpt} + \mathbf{\Gamma} \cdot Industry\,effect_{jt} + \boldsymbol{\kappa} \cdot Control_{pt} + \varepsilon_{jpt}, \quad (1)$$

where Y_{jpt} is the number of new (exiting) establishments, start-up (exit) rates, or ln (number of employees per establishment) for industry i in prefecture p in year t in separate regression models. *Dependence* represents the industry's dependence on external financing, its informational asymmetry, or a cross term of those factors. *Concentration* represents the degree of concentration in the banking sector. *Share* represents the industry's employment

[3] For examples of this specification, see Rajan and Zingales (1998), Cetorelli and Gambera (2001), Cetorelli and Strahan (2006), and Bonaccorsi Di Patti and Dell'Ariccia (2004).

share, to control for the significance of a given sector in prefecture p in year t. The expected sign of this variable is negative since opportunities for new business or firm growth are limited in already grown-up industries (Rajan and Zingales 1998; Cetorelli and Gambera 2001; Cetorelli and Strahan 2006)[4]. *Industry effect* is a cross term of industry dummy and time dummy variables to control time-variant industry effects. *Control* contains variables to control local market demand such as industry accumulation and market sizes.

Two problems arise in the estimation of equation (1). The first is a multicolinearity problem that stems from the serial correlation between *Concentration* and *Control* because of banks being dense in populous areas. The second is an endogeneity problem. When unobservable factors determine the industrial structure of local markets as well as the level of interbank competition, concentration in banking markets and dependent variables become endogenous. A traditional remedy for this problem is to use instrumental variable methods or a fixed-effects estimator. Following Cetorelli and Strahan (2006), a prefecture fixed effect is used for this endogeneity problem.

The empirical model can be rewritten as follows:

$$Y_{jpt} = \alpha_2 + \beta_2 \cdot (Dependence_j \cdot Concentration_{pt}) + \mathbf{\Phi} \cdot Market\,effect_{pt} + \delta_2 \cdot Share_{jpt} + \mathbf{\Lambda} \cdot Industry\,effect_{jt} + \varepsilon_{jpt}, \quad (2)$$

[4] On the other hand, a negative sign is also expected because declining industries have smaller shares, fewer new entrants, and less growth.

where $Market effect$ is a cross term of prefecture dummies and year dummies to control for time-variant regional effects. Omitted variables problems and endogeneity problems are solved by including both $Market effect$ and $Industry effect$. However, the direct effect of $Concentration$ cannot be estimated because it is now omitted in equation (2). [5]

A summary of the hypotheses and the expected signs are provided on Table 1.

3.2 Data

Following previous studies, the aggregated data at the prefecture and industry level is used for the regression analysis. Data on the number of new establishments and employees are taken from the *Establishment and Enterprise Census* issued by the Ministry of Internal Affairs and Communications. This survey is conducted every five years and a less refined survey is conducted in the middle of each five-year period. Data used in this study are taken from the surveys that are conducted on July 1, 1991; April 8, 1994; October 1, 1996; July 1, 1999; October 1, 2001; June 1, 2004; and October 1, 2006.[6] Since the surveys for new establishments are conducted only in years 1994, 1999, and 2004 for the sample periods, estimations of the number of new entrants and of start-up (exit) rates are limited to those years. To investigate the

[5] The effect of $Concentration$ cannot be identified since it takes the same value within prefecture*year and it is absorbed in $Market\ effect$.

[6] The survey is conducted approximately every two and a half years (+/− three months).

effects of interbank competition, the sample is limited to privately owned establishments. Data on the number of new establishments and employees at the two-digit industry and prefecture level are used for the regression analysis.

Some might argue that a small firm is an establishment by itself; however, large firms are not considered as establishments because they generally comprise a head office and many branches. According to the survey of the *Establishment and Enterprise Census* conducted in year 2004, the share of single-unit establishments over total establishments is 75.5%. Therefore, most establishments are small firms. The benefits of using data on establishments are two-fold. First, since small firms usually consist of one establishment only, it is possible to capture the trend of the start-up rates of small businesses in this data. Second, firms tend to rely on internal funds for business expansion, while they are more likely to depend on external funds for creating new establishments. Moreover, an increase in the number of establishments will most probably be driven not by the expansion of existing establishments; instead, by the creation of new establishments. Thus, an increase in the number of establishments is more likely to be affected by the competition in the credit market (Rajan and Zingales 1998). In case of Japan, according to *Useful Labour Statistics: 2011* issued by the Japan Institute for Labour Policy and Training, for the period 1992–1996, the start-up rate of new establishments through the expansion of existing businesses is 1.0%, while start-up rate through new firm creation is 2.2%. The start-up

rate of new establishments by existing firms is 4.1%, and the start-up rate of new establishments through the creation of new firms rose to 8% from 2001 to 2004. Thus, the number of new establishments reflects the trend in the creation of small firms in Japan. Therefore, we use the establishment data to compare our results with previous studies.

The distribution of establishments by size is provided in Table 2. The share of establishments with fewer than 10 employees is 80.5%. This suggests that most establishments are small firms. Summary statistics of the variables used in this study are presented in Table 3. The median number of employees per establishment is 11.

The proxies of independent variables are explained in detail as follows.

Credit market competition

As a proxy for bank concentration in the local credit market, the Herfindahl-Hirschman Index (HHI) of bank loans by prefectures is used. The Index is calculated according to each bank's total loan amount in a given prefecture by including only regional and second-tier regional banks, credit associations, and credit cooperatives. Data on an individual bank's total loan amount by prefecture for city banks, trust banks, and long-term trust banks are unavailable. We used three different data sources: *Kinyu Map* published by the Financial Journal Co., *Zenkoku Shinyokinko Zaimu Shohyo,* and *Zenkoku Shinyokumiai Zaimu Shohyo* published by Kinyu

Tosho Consultant Co. All independent variables in the previous year are used to avoid simultaneous problems. Some might argue that geographical area for SMEs bank loan markets at the prefecture level is too wide and the municipal level is better. However, with data availability, it is assumed that credit market conditions are the same for all firms within a given prefecture.[7]

Dependence on external financing

Two measures of an industry's dependence on external financing are included. First, the industry median bank loan/total assets for SMEs. To eliminate temporal shocks to a firms' loan/asset ratio, each firm's average loan-to-assets ratio is calculated over the period 1998–2002. Then, its industry median is used as a proxy for the industry's external dependence on financing. Data on industry median loan assets ratios are obtained from Shikimi (2013).[8] The weakness of this measure is that the observed loan amounts are the equilibrium between demand for and supply of bank loans. There is a possibility that the low bank loan ratio reflects firms' credit constraints despite the fact that firms' demand for bank loans is large. To avoid

[7] For the investigation of interbank competition on firm entry at the municipal level, we face two difficulties. First, the data on establishments at the municipal and industry level are unavailable. Second, it is extremely difficult to obtain data on each bank's lending at the bank branch level.

[8] Shikimi (2013) investigates the banking relationships of SMEs in Japan using data taken from the Japanese Accounts and Data on Enterprises (JADE) database, which covers over 100,000 Japanese firms, including small and medium-sized ones.

this identification problem, following Rajan and Zingales (1998) and Cetorelli and Strahan (2006), the second measure used in this study is listed firms' dependence on external financing. According to Rajan and Zingales (1998), the initial project scale, the time period required for a project to generate cash flow, and additional financing required for investments and their sizes vary among industries. Therefore, an industry's dependence on external financing is considered to be determined by an industry's technology for production. Therefore, an industry's technological dependence on external financing is used as a proxy for the industry's demand of external financing. To calculate this, data on listed firms is used. The pro of using data for listed firms is that it is unlikely that the listed firms incur credit constraints and the industry's actual external financial dependence is reflected. External dependence is defined as a change in total assets minus a change in retained earnings divided by total assets. A positive value indicates industries that are in financial deficit because they have invested more than their internal funds permit. The negative value means that they are in financial surplus since they have more internal funds than their investment. In the regression analysis, both dummy variables and the actual level of external dependence are used. To calculate this measure, each firm's external financial dependence is averaged over the period 1991–2006 to eliminate temporal fluctuations. Then, the industry median is used to eliminate the effect of outliers. Financial data on listed firms are taken from the *Financial Data Bank,* published by the

Development Bank of Japan. Samples are limited to firms that are listed for more than five years from 1991 to 2006. Initial Public Offer (IPO) firms are eliminated because their financial needs might be different from other listed firms.

Informational asymmetry

Prior studies on small business financing use firm age or firm size as proxies for informational asymmetry. These measures vary largely within industries, and the usage of the industry median is inappropriate. On the other hand, the difference between firms' production technology and types of investment projects are relatively large among industries, and relatively small within industries. In general, the precise value of firms' R&D investments and investments in intangible assets, such as goodwill, is difficult to evaluate for outsiders. Thus, there are large informational asymmetries in these investments. On the other hand, tangible fixed assets, such as machines and lands, are less likely to show informational asymmetry and can serve as collateral for bank loans. Therefore, two measures are used as proxies for informational asymmetries. The first measure is the industry median intangible fixed assets to total assets ratio. To calculate this, a firm's average intangible fixed assets ratio is taken over the period 1998–2002, and then the industry median is calculated. The data source is the same for the loan assets ratio.

The second measure is industry average Tobin's q since growing industries have fewer tangible fixed assets and more serious information asymmetric problems.[9] Industries with high q ratios are considered to have more growth opportunities. The industry average q ratio is calculated using data from all listed firms. The rationale for this approach is that it is impossible to calculate the q ratio for SMEs because most of them are unlisted firms. Data on firms' stock prices and other financial statements are taken from the *Financial Data Bank* published by the Development Bank of Japan.

To capture the effects of the relative importance of a given sector, an industry's employment share is used as a proxy for $Share_{\epsilon}$. Data on employees at an industry and prefecture level is taken from the *Establishment and Enterprise Census* issued by the Ministry of Internal Affairs and Communications. Additionally, the number of exiting establishments is included in the regression model for the number of new establishments. Table 3 shows the sample statistics.

4 Empirical results

4.1 The effect of interbank competition on the number of new establishments and start-up rates

[9] The correlation coefficients between the intangible fixed assets ratio and the industry average q, and between the intangible fixed assets ratio and the industry average sales growth rate are 0.38 and 0.59, respectively.

The estimation results on the determinants of the number of new entries are presented in Table 4.A. The Poisson estimator is used since the independent variable is expressed as a non-negative integer. ln (the number of establishments) at the beginning of a period at an industry and prefecture level is included to control for market size effects. All regression models include a cross term of industry and year dummies to control for time-variant industry-fixed effects. Similarly, they also include a cross term of prefecture dummies and year dummies to control for time-variant regional-fixed effects. Models (I) and (II) assume that the effects of interbank competition varies according to industry dependence on external financing, whereas Models (III) and (IV) present the results of how the effects of interbank competition differ among industries according to their respective level of information asymmetry. The cross term of median bank loan ratio and HHI at t−1 in Model (I) is positive but insignificant. The cross term of industry dependence on external finance and HHI is also positive but insignificant. In Model (III), the coefficient on the industry median intangible fixed assets ratio*HHI is negative and significant at the 1% level. This suggests that the number of new establishments in concentrated bank markets is higher in industries with a higher value of intangible fixed assets ratio. These results are consistent with hypotheses 2 and 3. Model (IV) includes the q ratio as a proxy for information symmetries. The coefficient on the q ratio*HHI is negative and

insignificant. Model (V) includes the interaction term of an external financial dependence dummy, an intangible fixed assets ratio, and HHI. An external financial dependence dummy takes a value of one when an industry's external financial dependence is positive and zero otherwise. The results show that the coefficient of this cross term is negative and significant at the 1% level and confirms H2 and H3. The results remain the same when outliers are dropped from the sample. Model (VI) includes a level of an industry's dependence on an external financing*intangible fixed assets ratio *HHI. In addition, the coefficient of this cross term is negative and significant at the 1% level, suggesting that the results in Model (V) are robust.

As for the industry's market share variable, the industry's employment share is unexpectedly positive and significant at the 1% level. This result can be interpreted to indicate few firm entries existing in declining industries. In addition, it can be interpreted to indicate that industries with a larger market share can provide good conditions for new start-ups because their infrastructures are already developed. The coefficient on In (the number of establishments) at the beginning of the year is expectedly positive and significant at the 1% level. The coefficient on the number of exiting establishments is insignificant.

To draw the implication for economic policy of the local economy, the regression results on start-up rates are presented in Table 4.B. The independent variable is ln (the year average number of new establishments/total number of establishments). The denominator is the total

number of establishments at an industry and prefecture level at the beginning of the year. Industries with zero new entries at the prefecture level are omitted from the sample in this regression. However, the estimation results are almost the same when industries with zero new establishments at the prefecture level are included in the sample. In Model (I), the cross term of bank loan dependence and HHI is positive but insignificant. The coefficient on the dependence on external finance*HHI is negative but insignificant. The coefficient of the intangible fixed assets ratio*HHI is negative and significant at the 1% level in Model (III), supporting H2 and H3. The result remains qualitatively the same when the q ratio is used as a proxy for informational asymmetry in Model (IV). The coefficient of the external finance dependence dummy*the intangible fixed assets ratio*HHI, and that of the level of external financial dependence*the intangible fixed assets ratio*HHI are both negative and significant at the 1% level in Models (V) and (VI). These results are the same as in Table 4.A.

To summarize the estimation results, the start-up rates in concentrated markets are lower in external financial dependent industries with a higher value of intangible fixed assets or q ratio. These results suggest that the increase in bank market power has a negative effect on start-up rates in external financial dependent sectors with less collateral and greater growth opportunities. The results imply that credit constraints of firms in these industries are less likely to be relaxed in concentrated banking markets.

To evaluate the economic significance, Table 6 presents the relative effect of an increased concentration in credit markets on start-up rates, when the level of information asymmetries and external dependence on financing is changed. The first row in Table 6 reports the percentage differences in start-up rates between industries with low external financial dependence (the 25th percentile) and industries with high external dependence (the 75th percentile), when the concentration of markets is increased from the 25th (0.21) to the 75th percentile (0.39). The coefficients from Models (I) to (V) in Table 4.B are used for computation. Table 6 shows that start-up rates of industries with a higher dependence are lower than those of industries with a lower dependence by 0.78% as local financial markets become more concentrated. An increase in bank market power reduces start-up rates by 3.04% in industries with a higher value of intangible fixed assets ratio relative to industries with a lower value of intangible fixed assets ratio. Reduced interbank competition leads to a decline in start-up rates of industries with a high q ratio by 0.83% than that of industries with a low q ratio. The last row of Table 6 shows the effect of increased concentration in local credit markets on dependent sectors with a higher intangible fixed assets ratio relative to nondependent sectors with a lower intangible fixed assets ratio. Increased bank market power reduces the start-up rates by 3.18%. These economic effects are not small since the median start-up rates at an industry and prefecture level is 4.2%.

4.2 The effect of interbank competition on exit rates

Next, the effect of interbank competition on exit rates is investigated. Estimation results are presented in Table 4.C. The independent variable is ln (the year average number of exiting establishments/total number of establishments). The coefficient on the dependence on external finance*HHI is positive and significant at the 1% level. This result implies that exit rates in external financial dependent industries are lower in competitive financial markets because relationship banking alleviates the financial constraints of firms. On the other hand, contrary to the results of start-up rates, the coefficients of the cross terms of asymmetric information and bank concentration variables are insignificant in Models (III) and (IV). The coefficient of the external finance dependence dummy*the intangible fixed assets ratio*HHI, and that of the level of external financial dependence*the intangible fixed assets ratio*HHI are both positive and significant at the 1% level in Models (V) and (VI). These results support H2 and H3.

The economic significance of an increased concentration in credit markets on exit rates is shown in the second column of Table 6. It shows that exit rates of industries with a higher financial dependence are higher than those of industries with a lower dependence by 1.74% as local financial markets become more concentrated. The last row shows the effect of increased concentration in local credit markets on dependent sectors with a higher intangible fixed assets

ratio relative to nondependent sectors with a lower intangible fixed assets ratio. Increased bank market power increases the exit rates by 1.21%.

4.3 The effect of interbank competition on establishment size

Next, the effect of interbank competition on establishment size is investigated. Estimation results are presented in Table 5. The dependent variable is ln (employees per establishment). The coefficient on the bank dependence*HHI variable is insignificant in Model (I). On the other hand, the coefficients of the external dependence*HHI, the intangible fixed assets ratio*HHI, and the q*HHI are negative and significant at the 1% level (Models (II)–(IV)). The coefficient on the external dependence*the intangible fixed assets ratio*HHI is negative and significant at the 1% level in Model (V). The highly significant negative effect of the increased concentration on the establishment size in dependent sectors with a high q ratio is also found in Model (VI). Taken together with the results on start-up rates, these results are consistent with H3 in that increased interbank competition has a positive effect on both start-up rates and on establishment sizes in dependent sectors with high informational asymmetries.

The economic significance of an increase in bank market power on establishment size is shown in the second column in Table 6. The coefficients from Models (I) to (V) in Table 5 are used for calculation. Increased concentration reduced average establishment size by 4.1% in

industries with higher intangible fixed assets ratio relative to industries with a lower intangible assets ratio. Similarly, an increase in concentration decreases the average size by 1.78% in dependent sectors relative to nondependent sectors, and by 1.37% in dependent sectors with higher intangible assets ratio than in nondependent sectors with lower intangible fixed assets ratio. These results suggest that firm growth is hampered among those in financially dependent sectors with less collateral due to credit constraints.

4.4 Interpretation

The estimation results are summarized as follows: the increased concentration has negative (positive) effects on start-up (exit) rates and establishment sizes in financially dependent sectors with a higher value of intangible fixed assets ratio. These results are consistent with H3.

In this subsection, the empirical results above are interpreted by comparing them with the studies surveyed in Section 2. The positive effect of increased concentration in local credit markets on firm exit in dependent sectors is consistent with the empirical findings of Shikimi (2013) that interbank competition relaxes credit constraints on SMEs in Japan. Taken together, the results obtained here and in the previous study imply that an increase in interbank competition leads to more relationship lending and the relaxation of credit constraints on SMEs. The negative effect of increased concentration in bank financing markets on firm

growth in informationally opaque industries suggests that firms are less likely to be locked into bank relationships in competitive markets and that they achieve higher growth because the hold-up problems are mitigated. Moreover, this result is consistent with the findings of Shikimi (2010) that a switch from a main bank to other banks is less likely to occur in concentrated markets and in concentrated banking relationships. On the other hand, the results obtained here contradict the empirical findings of Petersen and Rajan (1994, 1995) and Ogura (2007). The negative effect of increased concentration in the credit market on firm entry is consistent with the empirical findings of Cetorelli and Strahan (2006); however, the results on establishment size contradict each other in these studies. Mixed results are obtained even in the same country. One of the possible reasons for these differences is the data coverage of the sample in addition to the differences between aggregated data and micro data. Special attention must be paid to interpret the results obtained using the survey questionnaire data because sample firms are sometimes not representative firms. Obtaining data on SMEs is extremely difficult. Even if it is available, firms who report financial data are limited relative to large SMEs. Therefore, the possibility that a survey questionnaire includes a large number of small firms is very low. On the other hand, the negative aspect of using aggregated data is that it is impossible to control for the firm's heterogeneity within industries.

The negative effect of increased concentration on firms' entry into industries with a higher

value of intangible assets ratio contradicts the findings of Bonaccorsi Di Patti and Dell'Ariccia (2004). The results obtained in this study indicate that entrepreneurs with investment opportunities but less collateral experience difficulties in beginning a new business.

5. Conclusion

This paper empirically investigated the effects of interbank competition in local credit markets on firm entry, growth, and exit. Using aggregated establishment data at an industry and prefecture level, it is found that an increased concentration in credit markets has a negative effect on start-up rates and the average establishment size and a positive effect on exit rates in financially dependent sectors with a higher value of intangible assets ratio. These results imply that possible new entrants in industries with greater information asymmetries face difficulties in obtaining credit for a positive Net Present Value (NPV) project in a concentrated credit market.

The results obtained in this paper suggest that policy makers must keep in mind that effects of interbank competition on start-up (exit) rates and firm growth vary according to industry characteristics. Increased interbank competition relaxes the credit constraints of industries with high information asymmetries; it increases the number of firm entries and stimulates firm

growth, but decreases firm exit rates. However, policy makers and entrepreneurs cannot control the level of interbank competition. Economic policy to support possible new entrants with less collateral in concentrated banking markets needs to be designed to increase start-up rates and hence, stimulate economic growth in local markets.

Using the census data, this paper captured the overall effect of interbank competition in local credit markets on start-up (exit) rates and on the average size of establishments. However, the limitations of this study are that the mechanism through which interbank competition affects a firm's decision to start-up, exit, and firm growth are not directly explained in the aggregated data. Investigation by using micro data is needed to further explore this mechanism. Moreover, it is interesting to know the reason why mixed results are found within countries. Explaining these issues are left for future research.

References

Black, Sandra E. and Philip E. Strahan (2002) "Entrepreneurship and Bank Credit Availability," *Journal of Finance*, Vol. 57, No. 6, 2807–2833.

Bonaccorsi Di Patti, Emilia and Giovanni Dell'Ariccia (2004) "Bank Competition and Firm Creation," *Journal of Money, Credit, and Banking*, Vol. 36, No. 2, 225–51.

Boot, Arnoud W. A. and Anjan V. Thakor (2000) "Can Relationship Banking Survive

Competition?," *Journal of Finance*, Vol. 55, No. 2, 679–713.

Cetorelli, Nicoka and Michele Gambera (2001) "Banking Market Structure, Financial Dependence and Growth: International Evidence from Industry Data," *Journal of Finance*, Vol. 56, 617–648.

——and Philip E. Strahan (2006) "Finance as a Barrier to Entry: Bank Competition and Industry Structure in Local U.S. Markets," *Journal of Finance*, Vol. 61, No. 1, 437–461.

Claessens, Stigin and Luc Laeven (2005) "Financial Depdendence, Banking Sector Competition, and Economic Growth," *Journal of European Economic Association*, Vol. 3, No. 1, 179–207.

Fernández de Guevara, Juan and Joaquín Maudos (2009) "Regional Financial Development and Bank Competition: Effects on Firms' Growth," *Regional Studies*, Vol. 43. No. 2, 211–228.

Ogura, Yoshiaki (2007) "Lending Competition, Relationship Banking, and Credit Availability for Entrepreneurs," RIETI Discussion Paper Series 07-E-036.

Okamuro, Hiroyuki (2007) "Sonzoku, Seicho to Chiiki Tokusei (Survival, Growth, and Regional Factors)," Highch, Y., eds. *Shinkikaigyokigyou no seicho to tettai (Growth and exit of new start-ups*), 95–122, Keiso shobou, Tokyo (in Japanese).

Petersen, Mitchell A. and Raghuram G. Rajan (1994) "The Benefits of Lending Relationships:

Evidence from Small Business Data," *Journal of Finance*, Vol. 49, No. 1, 3–37.

—— and——(1995) "The Effect of Credit Market Competition on Lending Relationships," *The Quarterly Journal of Economics*, Vol. 110, No. 2, 407–443.

Rajan, Raghuram G. (1992) "Insiders and Outsiders: The Choice between Informed and Arm's-Length Debt." *Journal of Finance* Vol. 47, No. 4, 1367–1400.

——and Luigi Zingales (1998) "Financial Dependence and Growth," *American Economic Review*, Vol. 88, No. 3, 559–586.

Sharpe, Steven A. (1990) "Asymmetric Information, Bank Lending, and Implicit Contracts: A Stylized Model of Customer Relationships." *Journal of Finance* Vol. 45, No. 4, 1069–1087.

Shikimi, Masayo (2010) "Chushokigyou no gingo kirikae to ginkoukan kyousou, ginkou gappei, ginkou kiki (Bank Switch, Interbank Competition, Bank Merger, and Bank Liquidity Problem: Evidence from SMEs in Japan)," Kitamura, Y., eds. Ouyou micro keiryou keizai bunseki (*Applied Microecnometric Analysis*), 197–226, Nippon Hyoron Sha, Tokyo (in Japanese).

—— (2013), "Do Firms Benefit from Multiple Banking Relationships? Evidence from Small and Medium- Sized Firms in Japan," *International Economics and Economic Policy*, Vol. 10, No. 1, 127–157.

Von Thadden, E. L. (1995) “Long-Term Contracts, Short-Term Investment and Monitoring.” *Review of Economic Studies* Vol. 62, No. 4, 557–575.

Zarutskie**,** Rebecca (2006) “Evidence on the Effects of Bank Competition on Firm Borrowing and Investment,” *Journal of Financial Economics*, Vol. 81, No. 3, 503–37.

Table 1 Hypotheses and expected signs

Hypothesis	Dependent variables		
	Start-up rates	**Exit rates**	**Ln (employees per establishment)**
H1: Concentration in bank financing leads to an increase in relationship lending. Thus, concentration in bank financing markets has a positive (negative) effect on start-up (exit) rates of external finance dependent industries with more informational asymmetry and a negative effect on establishment sizes in those industries due to hold-up problems (Petersen and Rajan 1994, 1995; Bonaccorsi Di Patti and Dell' Ariccia 2004).	$\beta_2>0$	$\beta_2<0$	$\beta_2<0$
H2: Interbank competition leads to an increase in relationship lending (Boot and Thakor 2000). Thus, increased concentration in banking sectors has a negative (positive) effect on start-up (exit) rates in industries with more informational asymmetry and has a positive effect on the size of establishments in those industries.	$\beta_2<0$	$\beta_2>0$	$\beta_2>0$
H3: Interbank competition leads to an increase in relationship lending (Boot and Thakor 2000). Thus, an increase in interbank competition has a positive (negative) effect on the start-up (exit) rates of establishments in industries with more informational asymmetry. It also has a positive effect on the size of establishments in those industries because hold-up problems are mitigated due to a decline of firms' switching costs to other banks (Claessens and Laeven 2005).	$\beta_2<0$	$\beta_2>0$	$\beta_2<0$

Table 2 The distribution of establishment size

	Number of establishments	Share
Establishments with less than 4 employees	3,448,156	61.40%
Establishments with 5–9 employees	1,073,979	19.12%
Establishments with 10–29 employees	800,830	14.26%
Establishments with 30–49 employees	143,123	2.55%
Establishments with 50–99 employees	89,617	1.60%
Establishments with 100–299 employees	44,138	0.79%
Establishments with more than 300 employees	10,349	0.18%
Establishments with only temporaly workers	5,555	0.10%
Total	5,615,747	

Sources: The *Establishment and Enterprise Census* issued by the Ministry of Internal Affairs and Communications

Table 3 Summary statistics

Prefecture/two- digit industry/year	Number of observations	Mean	Median	Std. Dev.	25th percentile	75th percentile	Min	Max
Establishments								
Employees per establishment	23880	17.63	11.05	19.81	6.50	20.49	1	384.25
Number of new establishments	9183	199.82	45.00	521.21	10.00	160.00	0	11600.00
Number of exit establishments	9183	270.29	69.00	666.87	15.00	227.00	0	12579.00
Number of new establishments/total establishments	9183	0.05	0.04	0.06	0.03	0.06	0	1.10
Number of exiting establishments/total establishments	9183	0.07	0.06	0.05	0.05	0.08	0	3.71
Employment share (%)	23880	1.22	0.66	1.46	0.17	1.55	0.00	10.64
Industry characteristics								
Median loans/assets for SMEs	23880	0.42	0.41	0.12	0.36	0.45	0.13	0.92
External financial dependence for mature listed firms	21714	0.03	0.02	0.03	0.01	0.04	-0.02	0.17
Median intangible fixed assets/assets for SMEs	23880	0.32	0.31	0.12	0.21	0.39	0.07	0.67
Average q ratio for listed firms	17108	1.40	1.27	0.45	1.18	1.42	1.01	4.09
Interbank competition in local markets								
Herfindahl-Hirschmann Index of bank loans (HHI)	23880	0.29	0.28	0.13	0.21	0.39	0.00	0.62

Table 4.A The effect of concentration in banking markets on the number of new establishments

Dependent variable: number of new establishments	(Ⅰ)	(Ⅱ)	(Ⅲ)	(Ⅳ)	(Ⅴ)	(Ⅵ)
Median loan/assets for SMEs ×HHI (t–1)	0.234					
	(0.178)					
External financial dependence×HHI (t–1)		0.787				
		(0.808)				
Median intangible fixed assets/total assets×HHI (t–1)			-1.707 ***			
			(0.314)			
q×HHI (t–1)				-0.031		
				(0.110)		
External financial dependence dummy×intangible fixed assets ratio×HHI (t–1)					-0.526 ***	
					(0.185)	
External financial dependence×intangible fixed assets ratio×HHI (t–1)						-4.506 ***
Employment share (%)	0.030 ***	0.031 ***	0.023 ***	0.012	0.027 ***	0.028 ***
	(0.005)	(0.004)	(0.005)	(0.008)	(0.005)	(0.004)
ln(number of establishments) (t–1)	0.845 ***	0.845 ***	0.844 ***	0.899 ***	0.845 ***	0.845 ***
	(0.035)	(0.034)	(0.034)	(0.035)	(0.034)	(0.034)
constant	-1.440 ***	-1.423 ***	-1.203 ***	-0.870 ***	-1.346 ***	-1.378 ***
	(0.190)	(0.194)	(0.180)	(0.298)	(0.181)	(0.190)
Industry dummies* year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Prefecture dummies* year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of sample	9183	9183	9183	7427	9183	9183
Adjusted R2	-53838.8	-53838	-53394.4	-39468.1	-53744.1	-53795.4

The dependent variable is the number of new establishments. The external financial dependence dummy takes a value of one when industry's external financial dependence is positive and zero otherwise. The coefficients are estimated by the Poisson estimator. Two way (prefecture*year) cluster robust standard errors are in parentheses. Significance at the 1% level is denoted by ***.

Table 4.B The effect of concentration in banking markets on start-up rates

Dependent variable: ln(number of new establishments/total establishments)	(Ⅰ)	(Ⅱ)	(Ⅲ)	(Ⅳ)	(Ⅴ)	(Ⅵ)
Median loan/assets for SMEs ×HHI (t–1)	0.069					
	(0.342)					
External financial dependence×HHI (t–1)		-1.189				
		(1.060)				
Median intangible fixed assets/total assets×HHI (t–1)			-0.932 ***			
			(0.347)			
q×HHI (t–1)				-0.194 **		
				(0.083)		
External financial dependence dummy×intangible fixed assets ratio×HHI (t–1)					-0.975 ***	
					(0.263)	
External financial dependence×intangible fixed assets ratio×HHI (t–1)						-7.705 ***
						(2.257)
Employment share (%)	-0.027 **	-0.029 **	-0.031 ***	-0.028 **	-0.032 ***	-0.030 **
	(0.013)	(0.013)	(0.012)	(0.014)	(0.011)	(0.012)
ln(number of exiting establishments/ total establishmets) (t–2)	0.289 ***	0.283 ***	0.289 ***	0.292 ***	0.290 ***	0.289 ***
	(0.039)	(0.040)	(0.039)	(0.045)	(0.039)	(0.039)
constant	0.580 ***	1.474 ***	0.716 ***	0.951 ***	0.597 ***	0.586 ***
	(0.178)	(0.141)	(0.179)	(0.158)	(0.177)	(0.181)
Industry dummies* year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Prefecture dummies* year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of sample	5808	5907	5808	4606	5808	5808
Adjusted R2	0.7147	0.7194	0.7152	0.7239	0.7157	0.7152

The dependent variable is ln(the number of new establishments/total establishments). The external financial dependence dummy takes a value of one when industry's external financial dependence is positive and zero otherwise. Two way (prefecture*year) cluster robust standard errors are in parentheses. Significance at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

Table 4.C The effect of concentration in banking markets on exit rates

Dependent variable: ln(number of exiting establishments/total establishments)	(Ⅰ)	(Ⅱ)	(Ⅲ)	(Ⅳ)	(Ⅴ)	(Ⅵ)
Median loan/assets for SMEs ×HHI (t–1)	0.101					
	(0.228)					
External financial dependence×HHI (t–1)		2.670 ***				
		(0.666)				
Median intangible fixed assets/total assets×HHI (t–1)			0.186			
			(0.223)			
q×HHI (t–1)				0.075		
				(0.069)		
External financial dependence dummy×intangible fixed assets ratio×HHI (t–1)					0.371 ***	
					(0.133)	
External financial dependence×intangible fixed assets ratio×HHI (t–1)						4.845 ***
						(1.470)
Employment share (%)	0.013 **	0.015 **	0.014 **	0.007	0.015 **	0.015 **
	(0.005)	(0.006)	(0.006)	(0.005)	(0.006)	(0.006)
ln(number of new establishments/ total establishmets) (t–2)	0.066 ***	0.067 ***	0.067 ***	0.061 ***	0.067 ***	0.068 ***
	(0.016)	(0.016)	(0.016)	(0.018)	(0.016)	(0.016)
constant	2.177 ***	2.964 ***	2.167 ***	2.688 ***	2.152 ***	2.155 ***
	(0.133)	(0.128)	(0.142)	(0.056)	(0.138)	(0.137)
Industry dummies* year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Prefecture dummies* year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of sample	5892	5990	5892	4687	5892	5892
Adjusted R2	0.6636	0.6736	0.6637	0.6729	0.664	0.6641

The dependent variable is ln(the number of exiting establishments/total establishments). The external financial dependence dummy takes a value of one when industry's external financial dependence is positive and zero otherwise. Two way (prefecture*year) cluster robust standard errors are in parentheses. Significance at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

Table 5 The effect of concentration in banking markets on establishment size

Dependent variable: ln(employees per establishmet)	(Ⅰ)	(Ⅱ)	(Ⅲ)	(Ⅳ)	(Ⅴ)	(Ⅵ)
Median loan/assets for SMEs ×HHI (t-1)	0.111					
	(0.186)					
External financial dependence×HHI (t-1)		-2.734 ***				
		(0.897)				
Median intangible fixed assets/total assets×HHI (t-1)			-1.264 ***			
			(0.184)			
q×HHI (t-1)				-0.251 ***		
				(0.039)		
External financial dependence dummy×intangible fixed assets ratio×HHI (t-1)					-0.434 ***	
					(0.150)	
External financial dependence×intangible fixed assets ratio× HHI (t-1)						-9.235 ***
						(1.825)
Employment share (%)	0.118 ***	0.117 ***	0.116 ***	0.123 ***	0.116 ***	0.116 ***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.006)	(0.006)
constant	2.783 ***	2.764 ***	2.955 ***	2.872 ***	1.935 ***	2.767 ***
	(0.121)	(0.145)	(0.121)	(0.115)	(0.022)	(0.031)
Industry dummies* year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Prefecture dummies* year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of sample	23792	22010	23792	17330	21427	21427
R2	0.8312	0.791	0.8316	0.7662	0.8201	0.8203

The dependent variable is ln(the number of new establishments/total establishments (t-1)). The external financial dependence dummy takes a value of one when industry's external financial dependence is positive and zero otherwise. Two way (prefecture*year) cluster robust standard errors are in parentheses. Significance at the 1% level is denoted by ***.

Table 6 Economic significance of an increase in concentration of banking markets on start-up rates and establishment size

(%)

	Start-up rates	Exit rates	ln(employees per establishmet)
Relative effect of a change in HHI from the 25th percentiles to the 75th percentile			
Median loan/assets for SMEs	0.12	0.18	0.19
External financial dependence	-0.78	1.74 ***	-1.78 ***
Median intangible fixed assets/total assets	-3.04 ***	0.61	-4.12 ***
q	-0.83 **	0.32	-1.07 **
External financial dependence dummy× intangible fixed assets ratio[a)]	-3.18 ***	1.21 ***	-1.37 *

This table reports, for example, the percentage differences in start-up rates (or establishment size) between industries with low external financial dependence (at the 25th percentiles) and industries with high external dependence (at the 75th percentile) when the concentration of markets is increased from the 25th percentile (0.21) to the 75th percentile (0.39).

[a)] It shows the effect of increased concentration in local credit markets on dependent sectors with a higher value of intangible fixed assets ratio relative to nondependent sectors with a lower value of intangible fixed assets ratio.