

Discussion Paper #2006-17

**Employer Size and Transition to Entrepreneurship:
Variations According to Organizational Position**

Ryuichiro Tsuchiya

December, 2006

Employer Size and Transition to Entrepreneurship:
Variations According to Organizational Position[※]

Ryuichiro Tsuchiya

Doctoral Course, Graduate School of Economics,
Hitotsubashi University

Address: 2-1 Naka, Kunitachi, Tokyo 186-8601, Japan

Phone: +81-3-3709-6528

E-mail: ed053004@srv.cc.hit-u.ac.jp

Keywords: Entrepreneurship, Firm Size,
Entry, Spin-off, Organizational Position

JEL Codes: J24, L25, M13, M21

Abstract

Although transition to entrepreneurship is a central subject in entrepreneurial studies, there is little research on its link with previous employer firm size. This study examines this relationship by utilizing a rich data set representing the entire Taiwanese labor market. While we found that smaller firms produce more entrepreneurs for all employees, the transitional probabilities of middle managers are higher in larger firms, indicating a specific firm size effect caused by organizational characteristics associated with position. In larger firms, the wide range of information that middle managers process facilitates entrepreneurial discoveries, and intense competition for senior management positions lowers opportunity costs.

I. Introduction

In entrepreneurial studies, the relationship between the organizational characteristics of the previous employer and entrepreneurship by former employees has recently

[※] This research is supported by a Hitotsubashi University Center of Excellence / Research on Economic System (COE/RES) Project Grant. I am deeply indebted to my doctoral dissertation advisers, Sinkichi Taniguchi and Hiroyuki Okamuro, for their counsel and guidance.

begun to draw considerable attention (Klepper, 2002; Sørensen and Phillips, 2004). While many scholars have explored the choice of whether to opt for entrepreneurship, entrepreneurial choice (Blanchflower and Oswald, 1994; Dunn and Holtz-Eakin, 2000; Evans and Jovanovic, 1989; Evans and Leighton, 1989; Holtz-Eakin et al., 1994), little attention has been paid to its link with employer firm size.

To our knowledge, Blanchflower and Meyer (1994) provide possibly the first individual-level evidence that entrepreneurial entry declines as the employer increases in size, other factors being constant. Exploring this point further, Wagner (2004) preliminarily reports that employees of younger and smaller firms are more likely to step into self-employment. Similarly, Dobrev and Barnett (2005) argue that the likelihood of entrepreneurial entry has a negative relationship with both firm size and firm age.

Each of these studies argues that entrepreneurial choice decreases as firm size increases, other factors being constant. The following might be the predominant reasons for these findings. First, in small businesses, managers directing entrepreneurial firms allow employees in close proximity to obtain a priori information on the entrepreneurial activities. According to both Sorensen and Audia (2000) and Wagner (2004), entrepreneurial information provided by small business managers tends to promote employees' entry into entrepreneurship ("employer-as-a-role-model effect").

Dobrev and Barnett (2005) argue that in larger firms, which tend to have well-developed internal labor markets, the firm members are less likely to make contact with nonmembers, which results in lower recognition of external entrepreneurial opportunities.

They also point out that institutionalized and well-funded corporate entrepreneurship in larger firms deters innovative members from leaving. Since many

larger firms can provide sufficient incentives and resources to meet the demands of innovative members, the probability of entrepreneurial entry for employees in these firms is lower.

Nevertheless, these studies pay little further attention to the possibility that the impact of employer size might vary according to the employee's position within the firm. Given these dissimilar effects, it is possible that firm size exerts a specific influence on high-ranking employees facing entrepreneurial choice. This study examines the impact of firm size by taking employee position into consideration, using a rich data set on employer characteristics that represents the entire Taiwanese labor market. We first examine comprehensive impact of firm size on all employees. Next, in order to assess the specific effect on high-ranking employees apart from the comprehensive effect, we examine the difference in entrepreneurial choice between the middle managers of large firms and those of small firms, holding other parameters constant¹. Although we certainly presume that middle managers are also affected by the comprehensive firm size effect, according to our hypothesis, other organizational characteristics, particularly those associated with employee position, influence middle managers' entrepreneurial choices.

In the economic literature, studies exploring the role of middle managers are primarily classified into two categories: team theory and incentive theory. These theories appear useful when we assess whether firm size exerts a specific influence on high-ranking employees apart from the comprehensive effect. Team theory focuses on the difference in tasks between a manager and subordinates. While subordinates undertake a variety of tasks, a middle manager specializes in coordinating these tasks. The middle manager supervises and monitors the effort levels of subordinates (Qian, 1994), aggregates the external information of the firm analyzed by subordinates,

¹ The effect of previous management experience is analyzed by Bates (1990), although he finds no significant impact of experience in management capacity on the survival of small businesses.

reports this information to the direct superior (Bolton and Dewatripont, 1994), and allocates managerial resources to subordinates (Cremer, 1980). A manager reads reports written by subordinates, summarizes them, and sends them to an upper stratum together with his/her own analysis of the external information. Under the assumption of sufficiently low communication costs between strata, the external information analyzed at the lower strata is continuously aggregated and summarized as it climbs up the hierarchy. Since the report has been repeatedly summarized by the time it reaches middle management, middle managers tend to have access to a wide range of external information.

On the other hand, incentive theory treats the managerial hierarchy as providing an incentive for employees to perform productively (Lazear, 1981). A managerial position is a prize given to the most productive employee. The managerial hierarchy functions as a tournament, in which employees compete with each other in order to realize the expected returns from the prize. Aiming to win this competition, employees invest their own skills and improve their own productivity.

In team theory, the external information at the middle management level is further summarized and generalized as the number of strata below middle management increases. In larger firms, which tend to have a stratified hierarchy, the number of workers in the layers below middle management increases exponentially. In the presence of information asymmetry, the middle managers of large firms can seek innovative ideas from information received from a wider range compared to their counterparts in small firms. Shane (2000) argues that when information is not uniformly distributed in society, potential entrepreneurs are more likely to discover opportunities related to prior knowledge obtained primarily through either education or work experience. Information processed by potential entrepreneurs in employer organizations plays a significant role in the discovery of entrepreneurial opportunities.

For middle managers, the sizeable informational networks in large firms increase the necessity to work as communication hubs in the presence of informational flaws, and they need to possess a wide range of information. As a firm increases in size, the possibility of the discovery of entrepreneurial opportunities by middle management might increase because those at this level are more likely to find opportunities that have not been identified by others due to the prior knowledge that greater scope provides².

Further, in team theory, middle managers should send reports to their superiors. They are also commissioned a certain share of managerial resources. Interactions with superiors appear to constitute a considerable portion of a middle manager's tasks. Middle managers in small businesses tend to have frequent interactions with business owners, while their counterparts in larger firms typically do not have much contact with the principal decision-makers of their firms due to the several intervening strata. In the close interactions between small business owners and middle managers, in which they share information, the employer-as-a-role-model effect mentioned earlier might be distinctively multiplied.

In incentive theory, the expected return from a prize in an employee's prospects encourages him/her to enhance productivity. From the perspective of incentive theory, a possible promotion to a top management position serves as one of the greatest incentives for middle managers. The prospects of middle managers comprise the probability of promotion to senior management and the compensation for the position. While compensation in larger firms tends to be considerably higher, middle managers need to win more intense competition to advance to these positions. As firm size increases, competition becomes more intense and reduces the expected return from a possible promotion, thereby undermining the incentive for middle managers to remain

² Recently, however, Garicano and Hubbard (in press) have argued that middle managers become specialists in larger firms. Their findings indicate that while the scope of the information available for middle managers expands with organizational size, the information becomes more closely related with their specialties.

in the organization. This, in turn, may facilitate entry into entrepreneurial activities³.

In summary, we need to test two opposing hypotheses. First, due to the greater recognition of entrepreneurial opportunities and the comparatively lower probability of promotion to senior management in larger firms, the middle managers of larger firms are more likely to enter entrepreneurship. The contrary hypothesis is derived from the augmented employer-as-a-role-model effect in the middle managements of small businesses.

The empirical methods are presented in the following section. Due to characteristics unique to entrepreneurial transitional data, we need to address several methodological problems. The next section discusses these problems along with other empirical issues. The results are discussed in section III. We found that entrepreneurial entry declines with an increase in firm size for all employees, but increases with firm size in the case of middle managers. Section IV presents a summary, the implications of the results, the limitations of this study, and the future tasks.

II. Estimation Method

The data used for this study were derived from Manpower Utilization Survey 2004, an annual governmental labor force survey in Taiwan. The scope of this survey included 60,219 individuals from randomly selected households nationwide. Since we wished to employ data of employees, employees in the public sector and unpaid family laborers were excluded from our sample in order to estimate the effect of firm size more precisely.

In addition, observations with missing values for data on spouses were omitted. We identified marital relationships according to each family member's relationship with

³ Nevertheless, the nonpecuniary benefits obtained from advancement to a senior management position appear to be significantly greater for middle managers in larger firms. In larger firms, senior managers are given authority to mobilize a greater amount of firm resources and have a higher social status.

the household head. For example, if a subject employee was a son of the household head, we identified the spouse as a family member whose family role was that of the son's wife. However, if this family had two or more married sons, we could not uniquely specify the employee's wife. This method also led to the exclusion of observations in which the spouse was living outside the target employee's household. For this reason, 63 observations were excluded from the study.

Consequently, our sample comprised 17,395 employees in 2003. The survey was administered to workers in 2004. Among other things, they were asked if they had changed jobs in 2003 and the reason for the job change. There were 69 voluntary job changes with the aim of establishing a business.

Our dependent variable representing entrepreneurial choice takes 1 if there was one voluntary resignation in 2003 with the aim of establishing a business, and 0 if the respondent had remained in the same job or had changed his/her job voluntarily for reasons other than establishing a business. In the entrepreneurial literature, many identify the entrepreneurial entry by checking whether an employee considered in a given year's data became self-employed in the subsequent year, despite some measurement errors. On the other hand, our dependent variable, being a more precise variable, could capture the direct behavioral outcomes of entrepreneurial choice.

As mentioned earlier, since we obtained our sample by tracing back from the working population in 2004 to entrepreneurial entrants in the previous year, those who had resigned from their jobs to establish businesses in 2003 but later entered the nonworking population in the subsequent year are automatically excluded from our sample. Hence, it is possible that our dependent variable may underestimate the actual number of entrants.

The dependent variable, voluntary resignation from a paid job to establish a business, includes an extremely small number of 1s, since there were only 69 entrants

in the entire sample of 17,395 observations. Data such as this are common in the study of entrepreneurial transition and are referred to as “rare events data.” In rare events data, the utilization of logisitic regression may inhibit accurate estimations because of finite sample bias. In order to remedy this possible bias, following King and Zeng (2001a; 2001b), we employed rare events logistic regression⁴. Our econometric model is as follows.

$$E_i^* = \mathbf{X}_i' \boldsymbol{\beta}_1 + \beta_2 S_i + (\beta_3 + \beta_4 S_i) M_i + \varepsilon_i \quad (1)$$

E_i^* denotes the entrepreneurial choice of the i th observation, \mathbf{X} denotes a vector of control variables and $\boldsymbol{\beta}_1$ is its coefficient vector, S_i denotes firm size and β_2 is its coefficient, M_i represents a middle manager, and ε_i denotes unobservable errors. The comprehensive effect of firm size that affects all employees regardless of position is captured by β_2 . The middle management position is defined by a dichotomous variable that takes 1 if an employee is the head of any of the following departments: production, accounts, sales, human resource, public relations, procurement, information, research and development, and others. In order to examine the specific firm size effect on middle managers, we decomposed the effect of the middle management variable into β_4 —a specific effect proportional to firm size—and β_3 —which represents the other general effects of a middle management position. Practically, together with the firm size and middle management variables, an interaction variable that is defined by multiplying these two variables was introduced in the regression specification. Used together with the comprehensive firm size effect, the interaction variable could describe a component proportional to firm size in the case of the effect of middle management.

However, in our rare events data, the number of entrants from middle management was considerably smaller than that of entrants from the entire sample. Our data could

⁴ Nevertheless, our results shown later do not appear to depend on the choice of the regression method used. Both the probit and logit estimations yielded results that were rather similar to those of the rare events logit.

only provide qualitative variables regarding which firm size class the employers were classified into. Due to the rare events feature of our data, some of the classes had no entry from middle management. If we utilize the several dummy variables assigned to the firm size classes, the values of our dependent variable corresponding to the 1s of some of the interaction variables (the middle manager dummy as well as the firm size class dummy equals 1) will not include 1 (no entry), in which case we will be unable to obtain estimates of the interaction variables.

For this reason, despite some possibility of an increase in measurement errors we converted approximately this qualitative data to quantitative variables by substituting the average number of workers of Taiwanese firms within each size class according to the Industry, Commerce, and Service Census 2001⁵. Other approximations obtained by substituting the lower limit of the size class (for example, one worker for a class with less than ten workers), the upper limit (nine workers for that class), or the median value (five workers for that class) yielded quite similar results in subsequent regression analyses. Our results do not appear to depend on the approximation method. The logarithm of this approximated firm size was employed as a regressor.

With regard to control variables, gender differences were captured by a dichotomous variable representing females. While employees having spouses and more children are more likely to be risk averse, on the other hand, the emotional support from their families might encourage their entrepreneurial aspiration. In order to capture the possible heterogeneity arising from family structure, dichotomous variables for married employees and number of children under 18 years were employed as controls⁶.

Employee age and the square of age were also utilized. The effect of age might be

⁵ We substitute 2.467 for employers belonging to a size class between one and nine workers, 15.651 for a class between ten and 29 workers, 37.610 for a class between 30 and 49 workers, 68.282 for a class between 50 and 99 workers, 191.742 for a class between 100 and 499 workers, and 1604.437 for a class with 500 or more workers.

⁶ Holtz-Eakin et al. (1994a; 1994b) analyzed entrepreneurial choice and the survival of the self-employed; they found that the coefficient estimate of the number of children under 18 years is not significantly different from zero.

quadratic since age represents experience and amount of financial capital; however, at the same time, it signifies decreasing physical strength.

As financial constraints might be relaxed if the employee's spouse earns an income, we employed a dichotomous variable to represent the spouse earning an income in the labor market (this excludes unpaid family labor)⁷.

In order to describe the effect of the employee's education, our model included two dichotomous variables representing each level of education: junior college and university. Education appears to raise the returns from paid employment, thus lowering the probability of entrepreneurial entry.

Finally, wages were introduced in our specification for two reasons. First, given the wage differentials between large- and small-firm employees, entrepreneurial success tends to result in a greater relative increase in the lifetime earnings of small business employees as compared to those of their counterparts in large firms, thereby leading more small business employees to enter.

Second, the wages of middle managers are more strongly correlated with firm size, other factors being constant (Meagher and Wilson, 2004). As the hierarchy increases in size, middle managers are required to monitor more subordinates—which is necessary to elevate effort levels, and consequently receive greater earnings in return. Given the existence of wage differentials between middle managers in large and small firms even when observable and unobservable abilities are held constant, middle managers in larger firms are less likely to opt for entrepreneurial entry due to the greater opportunity costs involved.

We held constant the future prospects and opportunity costs by introducing a wage variable in the regression equations. By means of this variable, the effects of firm size hypothesized earlier were distinguished from those of both lifetime earnings and

⁷ Bernhardt (1994), employing a Canadian male sample, found that the probability of entrepreneurial entry significantly increases if the spouse works in the labor market.

opportunity costs.

Data on wages were available only for part of the sample from our data; therefore, we utilized predictions computed by an estimated wage function. The computation process is described in the Appendix.

III. Results

Table I shows the rare events logit estimates of the determinants of entrepreneurial choice. In Model 1, as can be observed, the coefficient estimate of firm size is negative and significantly different from zero, implying that entrepreneurial entry declines with firm size, other factors being constant. Our finding is consistent with the suggestions of several previous studies. Smaller firms are more likely to produce entrepreneurs, the primary reason for which could be any of the following: the employer-as-a-role-model effect, more frequent contacts with external entrepreneurial opportunities, or the lack of institutional corporate entrepreneurship. In our data, while other parameters are evaluated at their mean values, the probability of entrepreneurial entry decreases by roughly 0.289 percent when the employer size moves from the smallest to the largest size class.

The variable representing middle managers has a positive but insignificant coefficient. In Model 2, we decomposed this effect into a proportional effect to firm size and other general components by introducing an interaction variable. The coefficient estimate of the interaction variable, indicating the proportional effect, is significant and positive⁸. Even when we hold constant the comprehensive firm size effect and other controls, in the case of middle managers, entrepreneurial entry increases significantly with firm size, indicating that firm size exerts a specific influence on

⁸ This statistical significance is robust even when we excluded from the model the middle manager variable that has a high Pearson's correlation coefficient with the interaction variable.

middle managers.

In Column 3 of Table I, we obtain Model 3 by adding predicted wage levels to Model 1. As can be observed, despite significant changes in the coefficient estimates of some controls, the estimate of firm size is still significant and negative. Similarly, in Column 4 (Model 4), the main results in Model 2 are preserved even when we consider wage levels.

[Insert Table I about here.]

Figure I describes the changes in the predicted likelihood of entrepreneurial entry with changes in firm size. The entrepreneurial choice of all employees was predicted by Model 1 and that of middle managers was computed by Model 2 in Table I, while parameters other than the middle manager and firm size variables were evaluated at their mean values. As can be observed, the entrepreneurial entry of all employees declines with firm size. For middle managers, as the firm increases in size, β_4 —the specific firm size effect on middle managers—increases at a growing rate, while β_2 —the comprehensive effect—exhibits a comparatively moderate change. As a result, the overall likelihood of the entrepreneurial entry of middle managers rises with firm size at an increasing rate. In our data, the likelihood of middle managers opting for entrepreneurship does not exceed that of all employees until the firm reaches the class with no less than 30 and less than 50 workers; however, the difference between these two likelihoods continuously expands in the subsequent firm size classes.

This figure suggests that the entrepreneurial choice of middle managers differs significantly from the overall tendency. Organizational characteristics associated with position in the management hierarchy might be the primary factor causing this variation.

[Insert Figure I about here.]

These results might imply that firm size exerts a specific effect on middle managers, and the effect raises the likelihood of entrepreneurial choice. Two organizational characteristics discussed earlier might be relevant. The range of information processed by middle management is broadened as the size of the hierarchy increases; this offers advantages in the quest for entrepreneurial opportunities. Owing to the stiff competition for senior management positions, middle managers of larger firms are more likely to leave their organizations. While the “employer-as-a-role-model effect” might be virtually augmented to a certain degree in the case of the middle management of a small business, in our data, it is not sufficiently large to negate the positive impacts of firm size.

With regard to other controls, married employees are more likely to step into entrepreneurship, but they are less likely to do so when they have more children. Entrepreneurial entry increases rapidly with age among the younger cohort, but decreases at a gradual rate with age among the older cohort. This likelihood is maximized at the age of approximately 32 years, other factors being constant. This computation implies that the effect of physical strength slightly dominates those of experience and asset accumulation.

The coefficient estimate of university is positive and significant in Models 1 and 2, implying that university graduates are more likely to opt for entrepreneurship. In Models 3 and 4, on the other hand, the significant effect is diminished when we include predicted wages. Although the coefficient estimates of wages are not significant, these results suggest that the effect of education on entrepreneurial choice is closely correlated with that of wages and possibly even with that of asset accumulation. The

earnings of the spouse have a negative impact on entrepreneurial choice. One possible explanation for this is that if the spouse is working outside the home, the entrepreneurial firm cannot receive intrahousehold labor supply.

With regard to the robustness of our results, it may be argued that there is an alternative interpretation. This might be led by considerations associated with family firms. In family firms, typically, family members are favored for promotion, while nonmembers face many obstacles. Many small businesses are owned by families, and in such firms, middle management positions tend to be occupied by family members.

It may follow that low-ranking employees in small businesses are more likely to choose to be entrepreneurs because they face obstacles in promotion. In contrast, many middle managers in small businesses choose to remain in the employer firm since many of them are family members⁹.

We attempted to identify family firms, although we had to rely on a relatively rough measure. We defined a family firm by checking whether more than one member of the household was simultaneously working for an identical firm. This definition is useful at least in this study, although it is certainly inadequate to capture the realities of family firms. Based on our definition, 3,812 employer firms were identified as family firms.

We employed a dummy variable to represent family firms and added it to Model 2. The result showed that the coefficient estimates of both firm size and the interaction variable remained largely unchanged¹⁰. This result implies that even when we control factors associated with family firms, our major results remain unchanged.

⁹ Further, in large business groups, many family members tend to hold senior management positions. Since family control undermines middle managers' incentives to remain in a large firm, this could yield another alternative interpretation explaining the greater number of entrants from the middle management in larger firms.

¹⁰ Even when we defined another family business variable by narrowing our definition to firms owned by other members of the household, we obtained similar results.

IV. Conclusion

A significant link between firm size and entrepreneurial choice is presented. Other factors being constant, entrepreneurial entry decreases with firm size. This implies that the organizational characteristics of employers are closely correlated with the choice behaviors that potential entrepreneurs show in those firms.

Among middle managers, we found a specific firm size effect apart from the comprehensive one. This specific effect suggests that the likelihood of middle managers' entrepreneurial entry increases with an increase in firm size. The predominant reasons for this effect could be the broader range of information processed by middle managers in larger firms and the lower likelihood of their promotion to senior management.

The finding that smaller firms produce more entrepreneurs, *ceteris paribus*, highlights the role of the existing small business sector as the parent body of entrepreneurs. Since newly established firms are initially small, our findings imply that there exists a reproduction process in the small business sector, in which smaller firms create more entrepreneurs and the new firms that they establish are subsequently incorporated into the parent body.

In a process where incumbent organizations create new organizations, entrepreneurs play a mediating role. Our findings imply that organizational characteristics associated with employee position are important when we examine the effect of firm size on the choice of whether to become a mediator. It might follow that this choice is closely correlated with the difference between large and small incumbent organizations in terms of the manner in which workers become specialists.

Nevertheless, this study has several limitations. As mentioned earlier, our sample was obtained by tracing back from a working population in 2004 to entrants and

nonentrants in the previous year. This method inevitably led to the exclusion from the sample of potential entrants who had virtually opted for entrepreneurial entry in 2003 but were classified as nonworkers in the subsequent year.

Another data constraint is that we were unable to differentiate between potential entrepreneurs and employees without any entrepreneurial aspiration when exploring the comprehensive firm size effect for all employees. In the entrepreneurial transition, employees first become potential entrepreneurs when preparing to establish a business; the actual move to the entrepreneurial sector occurs in the second step. Potential entrepreneurs might differ from other employees in terms of labor market behavior and choice of workplace. When they are informed of the employer-as-a-role-model effect in smaller firms, for example, they may self-select to work for small business managers. In smaller firms, it is possible for a greater number of employees not to implement the first step, while for many large-firm employees, the two-step process is mostly required, which may increase heteroscedasticity in our data.

For future research, although we have shown a specific firm size effect on middle managers, it appears relevant to explore how the firm size effect exhibits variations in other organizational strata. The availability of data may provide further insights into the link between employer characteristics and entrepreneurial choice.

Appendix: The Wage Computation Process

Wage data was available only for a subsample of 16,196 observations. We first estimated the determinants of wages in the logarithmic form by following the Mincer equation. The estimates are shown in Table AI. The specification contained basic controls, experience, education, and middle manager and firm size dummies.

By utilizing this estimated function, we then projected the wages for all the observations. As data on working hours and tenure were unavailable for computation for the entire sample, these variables are evaluated at their mean values in the subsample.

[Insert Table AI about here.]

Table I
Determinants of Entrepreneurial Choice

This table shows the rare event logit estimates of the determinants of entrepreneurial choice. Model 1 examines the comprehensive effect of firm size for all employees. The coefficient estimate of firm size is both negative and significant, implying that smaller firms produce more entrepreneurs, other factors being constant. In Model 2, we analyzed the specific effect on middle managers by introducing an interaction variable. The interaction effect was both positively and significantly estimated, implying that there exists a specific firm size effect apart from the comprehensive one and that an increase in firm size leads to an increase in entrepreneurial entry. Even in Models 3 and 4, obtained by adding predicted prior wages to Models 1 and 2, respectively, we found similar results.

Variable	MODEL 1	MODEL 2	MODEL 3	MODEL 4
Female	-0.809 *** (0.285)	-0.809 *** (0.286)	-0.673 (0.750)	-0.834 (0.772)
Married	1.463 *** (0.459)	1.463 *** (0.459)	1.439 *** (0.464)	1.466 *** (0.460)
With Children	-0.461 *** (0.177)	-0.466 *** (0.177)	-0.463 *** (0.177)	-0.465 *** (0.177)
Age	0.230 *** (0.084)	0.229 *** (0.084)	0.207 * (0.122)	0.229 * (0.125)
Age ² /100	-0.336 *** (0.113)	-0.334 *** (0.113)	-0.306 ** (0.153)	-0.334 ** (0.157)
Junior College	0.428 (0.327)	0.437 (0.328)	0.356 (0.495)	0.451 (0.499)
University	0.713 *** (0.276)	0.707 ** (0.285)	0.570 (0.838)	0.738 (0.865)
Firm Size	-0.201 ** (0.088)	-0.236 ** (0.095)	-0.209 ** (0.097)	-0.231 ** (0.102)
Middle Manager	0.613 (0.688)	-1.552 (1.618)	0.343 (1.353)	-1.494 (1.947)
(Middle Manager)*(Firm Size)		0.543 * (0.281)		0.540 * (0.286)
Working Spouse	-1.000 *** (0.362)	-0.990 *** (0.364)	-1.001 *** (0.362)	-0.990 *** (0.364)
Professional	0.053 (0.416)	0.067 (0.419)	-0.062 (0.721)	0.088 (0.744)
CSC Worker	-0.029 (0.427)	-0.057 (0.426)	-0.055 (0.459)	-0.052 (0.462)
Service Worker	1.640 *** (0.416)	1.594 *** (0.412)	1.617 *** (0.427)	1.597 *** (0.427)
Manufacturing	-0.483 (0.379)	-0.500 (0.381)	-0.482 (0.380)	-0.501 (0.382)
Construction	-1.499 * (0.798)	-1.518 * (0.799)	-1.498 * (0.799)	-1.520 * (0.800)
Commerce	-0.216 (0.342)	-0.206 (0.341)	-0.240 (0.377)	-0.203 (0.377)
Logistics and Communication	-0.057 (0.608)	-0.062 (0.609)	-0.144 (0.747)	-0.048 (0.761)
Finance and Real Estate	-0.222 (0.629)	-0.187 (0.628)	-0.290 (0.728)	-0.179 (0.734)
Business Service	0.423 (0.505)	0.417 (0.505)	0.365 (0.598)	0.427 (0.599)
Predicted Wage			0.548 (2.646)	-0.099 (2.727)
Constant	-8.562 *** (1.521)	-8.457 *** (1.510)	-10.934 (11.820)	-7.970 (12.155)
Log Likelihood	79.76	83.20	79.78	83.21
Sample Size	17395	17395	17395	17395

The figures in parentheses are standard errors. *** denotes significance at the 1% level.

** denotes significance at the 5% level. * denotes significance at the 10% level.

Figure I
The Predicted Likelihood of Entrepreneurial Entry,
Middle Managers, and All Employees

This figure illustrates the changes in the likelihood of entrepreneurial entry for either all employees or middle managers according to firm size. In the case of all employees, entrepreneurial entry gradually decreases with firm size. On the other hand, due to the specific firm size effect, middle managers' likelihood of entrepreneurial entry increases at a growing rate. In firms that have fewer than 30 workers, the likelihood of middle managers' entrepreneurial entry is lower than that of all employees. However, in a size class of no less than 30 workers, middle managers are more likely to become entrepreneurs as compared to all employees.



Table II
A Summary of Variables

Variable	Number of Observations	Mean	Standard Deviation	Min	Max
Entrepreneurial Choice	17395	0.004	0.063	0	1
Female	17395	0.439	0.496	0	1
Married	17395	0.523	0.499	0	1
Number of Children	17395	0.669	1.006	0	12
Age	17395	35.966	10.550	15	78
Age ² /100	17395	14.048	8.209	2.250	60.840
Junior College	17395	0.176	0.381	0	1
University	17395	0.159	0.365	0	1
Firm Size	17395	2.920	1.973	0.903	7.381
Middle Manager	17395	0.026	0.160	0	1
(Middle Manager)*(Firm Size)	17395	0.104	0.704	0.000	7.381
Working Spouse	17395	0.352	0.478	0	1
Predicted Wage	17395	5.342	0.269	4.350	6.393
Professional	17395	0.265	0.442	0	1
CSC Worker	17395	0.326	0.469	0	1
Service Worker	17395	0.071	0.258	0	1
Manufacturing	17395	0.382	0.486	0	1
Construction	17395	0.102	0.303	0	1
Commerce	17395	0.197	0.397	0	1
Logistics and Communication	17395	0.044	0.204	0	1
Finance and Real Estate	17395	0.059	0.235	0	1
Business Service	17395	0.033	0.178	0	1

Table III
A Correlation Matrix

	1	2	3	4	5	6	7
1 Entrepreneurial Choice	1.000						
2 Female	-0.015	1.000					
3 Married	0.002	-0.043	1.000				
4 Children	-0.007	-0.048	0.635	1.000			
5 Age	-0.008	-0.092	0.520	0.139	1.000		
6 Age ² /100	-0.009	-0.087	0.478	0.073	0.988	1.000	
7 Junior College	0.002	0.049	-0.058	-0.018	-0.147	-0.152	1.000
8 University	0.010	-0.008	-0.094	-0.064	-0.105	-0.110	-0.201
9 Firm Size	-0.021	0.002	0.039	0.034	-0.021	-0.034	0.124
10 Middle Manager	0.007	-0.086	0.101	0.072	0.100	0.090	0.025
11 (Middle Manager)*(Firm Size)	0.012	-0.082	0.092	0.071	0.084	0.075	0.020
12 Working Spouse	-0.016	0.114	0.703	0.480	0.288	0.244	-0.016
13 Predicted Wage	0.013	-0.472	0.150	0.178	0.051	-0.005	0.206
	8	9	10	11	12	13	14
8 Junior College	1.000						
9 University	-0.201	1.000					
10 Firm Size	0.124	0.256	1.000				
11 Middle Manager	0.025	0.154	0.089	1.000			
12 (Middle Manager)*(Firm Size)	0.020	0.170	0.145	0.904	1.000		
13 Working Spouse	-0.016	-0.039	0.060	0.064	0.054	1.000	
14 Predicted Wage	0.206	0.554	0.392	0.394	0.381	0.096	1.000

Controls pertaining to occupations and industries are not shown due to space constraints.

Table AI
An Estimated Log Earnings Function

Variable		
Female	-0.242 ***	(0.005)
Married	0.044 ***	(0.006)
Junior College	0.147 ***	(0.008)
University	0.299 ***	(0.009)
Log Working Hours	0.171 ***	(0.005)
Experience	0.018 ***	(0.001)
Experience ² /100	-0.040 ***	(0.002)
Tenure	0.029 ***	(0.001)
Tenure ² /100	-0.063 ***	(0.004)
Middle Manager	0.471 ***	(0.017)
Professional	0.202 ***	(0.008)
CSC Worker	0.041 ***	(0.007)
Service Worker	0.031 ***	(0.012)
Manufacturing	-0.001	(0.008)
Construction	0.045 ***	(0.011)
Commerce	0.009	(0.008)
Logistics and Communication	0.155 ***	(0.014)
Finance and Real Estate	0.137 ***	(0.012)
Business Service	0.119 ***	(0.016)
Firm Size 100+	0.144 ***	(0.007)
Constant	9.209 ***	(0.022)
Adjusted R ²	0.490	
Sample Size	16196	

The figures in parentheses are standard errors. *** denotes significance at the 1% level.

** denotes significance at the 5% level. * denotes significance at the 10% level.

References

- Bates, T. (1990). Entrepreneur human capital inputs and small business longevity. *Review of Economics and Statistics*, 72, 551–559.
- Bernhardt, I. (1994). Comparative advantage in self-employment and paid work. *Canadian Journal of Economics*, 27, 273–289.
- Blanchflower, D. G., & Meyer, B. D. (1992). A longitudinal analysis of the young self-employed in Australia and the United States. *Small Business Economics*, 6, 1–19.
- Blanchflower, D. G., & Oswald, A. J. (1998). What makes an entrepreneur? *Journal of Labor Economics*, 16, 26–60.
- Bolton, P., & Mathias, D. (1994). The firm as a communication network. *Quarterly Journal of Economics*, 109, 809–839.
- Cremer, J. (1980). A partial theory of the optimal organization of a bureaucracy. *Bell Journal of Economics*, 11, 683–693.
- Dobrev, S. D., & Barnett, W. P. (2005). Organizational roles and transition to entrepreneurship. *Academy of Management Journal*, 48, 433–449.
- Dunn, T., & Holtz-Eakin, D. (2000). Financial capital, human capital, and the transition to self-employment: Evidence from intergenerational links. *Journal of Labor Economics*, 18, 282–305.
- Evans, D. S., & Jovanovic, B. (1989). An estimated model of entrepreneurial choice under liquidity constraints. *Journal of Political Economy*, 97, 808–827.
- Evans, D. S., & Leighton, L. S. (1989). Some empirical aspects of entrepreneurship. *American Economic Review*, 79, 519–535.
- Garicano, L., & Hubbard, T. N. (in press). Managerial leverage is limited by the extent of the market: Hierarchies, specialization, and the utilization of lawyer's human

- capital. *Journal of Law and Economics*.
- Holtz-Eakin, D., Joulfaian, D., & Rosen, H. S. (1994a). Sticking it out: Entrepreneurial survival and liquidity constraints. *Journal of Political Economy*, *102*, 53–75.
- Holtz-Eakin, D., Joulfaian, D., & Rosen, H. S. (1994b). Entrepreneurial decisions and liquidity constraints. *Rand Journal of Economics*, *25*, 334–347.
- King, G., & Zeng, L. (2001a). Explaining rare events in international relations. *International Organization*, *55*, 693–715.
- King, G., & Zeng, L. (2001b). Logistic regression in rare events data. *Political Analysis*, *9*, 137–163.
- Lazear, E. P., & Rosen, S. (1981). Rank-order tournaments as optimum labor contracts. *Journal of Political Economy*, *89*, 841–864.
- Meagher, K. J., & Wilson, H. (2004). Different firm size effects on wages for supervisors and workers. *Economic Letters*, *84*, 225–230.
- Qian, Y. (1994). Incentives and loss of control in an optimal hierarchy. *Review of Economic Studies*, *61*, 527–544.
- Shane, S. (2000). Prior knowledge and the discovery of entrepreneurial opportunities. *Organizational Science*, *11*, 448–469.
- Sørensen, J. B., & Phillips, D. J. (2004, October). Do small firms produce better entrepreneurs? Paper presented at the Harvard Business School Entrepreneurship Conference. Boston, MA.
- Sorensen, O., & Audia, P. G. (2000). The social structure of entrepreneurial activity: Geographic concentration of footwear production in the United States, 1940-1989. *American Journal of Sociology*, *106*, 424–462.
- Wagner, J. (2004). Are young and small firms hothouses for nascent entrepreneurs? Evidence from German micro data. *IZA Discussion Paper*, *989*.

