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The Impact of Family Business Apprenticeship on Entrepreneurship and Survival of Small Businesses: Evidence from Thailand

by

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Abstract

This paper investigates the impact of exposure to a family business and participating in a family business on individuals decision to start a business (self-employed and small business) and their likelihood of survival. We find that individuals who have a family member doing business are more likely to start their own business. However, only individuals who have actually worked in the family-owned business are more likely to survive longer. This paper demonstrates that the higher the number of hours they worked in a family business, the higher the probability of survival. The impact remains significant even if the sample includes only individuals who are the spouses of business owners. The impact of prior experience from helping a family business depreciates over a short period of time. This result suggests that entrepreneurial skills can be learned from an apprenticeship in small businesses.

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Keywords: entrepreneurial skills, entrepreneurship, business survival, family business, business experience

JEL Classification: J24, L26, M13

1 Introduction

The literature shows that the likelihood of becoming an entrepreneur is higher for a person who has a family member who is an entrepreneur (e.g., Djankov et al., 2005; Dunn and Holtz-Eakin, 2000; Laband and Lentz, 1983; Lindquist et al., 2015; Taylor, 2001). Potential explanations include role model or entrepreneurial preferences, capital accessibility, and learning by doing. In the past several years, there has been more interest in the role of family business ownership in business survival (e.g., Fairlie and Robb, 2007; Millán et al., 2012; Van Praag, 2003). Most of the studies find that simply having an entrepreneur in a family does not increase the chance of business survival. This result seems to suggest that living in a family operating a business could not create sufficient entrepreneurial ability in the person. However, such an insignificant influence could come from the fact that most of the people who live in business-operating families may not work in those businesses (in our data, only 34% of individuals who live in a family operating a business worked in that business). This indicates that entrepreneurial skills require practice.

To the best of our knowledge, only Fairlie and Robb (2007) have sufficient data to look at whether working in a family-owned business increases the likelihood of survival, and they find that it matters. However, with the limited data, they could not tell whether working more would help more. Our key contribution is to add that piece of information to the literature, since our data contain such valuable information on the intensive margin in the form of working hours in family-owned businesses. Also, with more comprehensive data, this paper can also analysze decisions to start businesses more formally than Fairlie and Robb (2007). To sum up, this paper tests whether working in a family-owned business increases the likelihood of starting a business and lowers the chance of closing one. The result should improve our understanding of entrepreneurship.

This paper uses a nationally representative panel dataset from Thailand, conducted by the National Statistical Office (NSO) of Thailand in 2005, 2006, 2007, 2010 and 2012 (in five waves) to analyze both entrepreneurship and business exit decisions. The data cover more than 15,000 individuals from around 6,000 households. This dataset is significantly larger than the Townsend Thai dataset employed in Paulson and Townsend (2004), who study only entrepreneurship decisions in Thailand as well. With a sufficiently long and large dataset, we can analyze not only entrepreneurship decisions but also exit decisions.

Our main results can be summarized as follows. We found that simply having a family member who is an entrepreneur and a number of hours worked in a family-owned business increase the likelihood of an individual to start a new business. However, simply having an entrepreneur in the household does not increase the likelihood of survival. On the other hand, the working hours in a family business have a negative and significant impact on business closure, especially for small businesses. That is, an entrepreneur who worked in a family business for more hours in the past is more likely to survive, although the effect becomes statistically insignificant for self employment. One might ask whether the impact of working in a family-owned business comes from the process of learning by doing, or it is just self-selection. We found suggestive evidence showing that learning by doing plays a role here, since the impact on the likelihood of business survival is temporary and depreciates over time.

The remainder of the paper proceeds as follows. Section 2 reviews related literature on entrepreneurship and the survival of small businesses. We describe the data used in the analysis and explain the measurements of starting, closing and explanatory variables in Section 3. In Section 4, model specifications are described. In Section 5, we present the reduced form estimation results of entrepreneurship using logit regression and business closure using logistic hazard regression with random effect. Section 6 summarizes the findings.

2 Related Literature

A number of empirical studies report that individuals who have parental entrepreneurs are more likely to become entrepreneurs themselves (see, e.g., Djankov et al., 2005; Dunn and Holtz-Eakin, 2000; Lindquist et al., 2015; Taylor, 2001).Potential explanations include inheritance of a business, access to more capital, role modeling and learning by doing. Lindquist et al. (2015) claim that role modeling and/or learning by doing are more significant than other factors. Fairlie and Robb (2007) find that having prior work experience in a family owned business increases the likelihood of survival and business profit, while simply living in the business-operating family does not. This result suggests that entrepreneurial skills require an apprenticeship in a family owned business. However, owing to data limitation, the study cannot show the effect on business outcomes of the number of hours individuals help their family business. Also, for the same reason, they cannot perform an econometric analysis of the impact of helping a family business on the decision to become an entrepreneur.

The literature also shows that ex-business owners tend to become serial entrepreneurs (Chen, 2013; Lafontaine and Shaw, 2014). However, the impact of previous business experience on business survival is inconclusive. On the one hand, Taylor (1999) and Baptista et al. (2007) show that entrepreneurial experience increases the longevity of a new business. On the other hand, Cressy (1996); Gimeno et al. (1997); Gottschalk et al. (2014); Van Praag (2003) find no significant impact of entrepreneurial experience on new business survival. On the side that finds its positive impact on survival, there is an ongoing debate about whether the impact comes from the learning by doing effect or just self-selection. Studies by Chen (2013) and Lafontaine and Shaw (2014) which report that previous experiences can lead to better performance within the same industry only seem to support the argument of learning by doing. If the serial entrepreneurs perform better owing to the learning by doing effect rather than innate ability, the impact might vanish over time, as found by Parker (2013). In fact, this is the case in our study as well. However, the recent work by Rocha et al. (2015) finds that serial entrepreneurs are not a random sample but self-selection.

Formal education is an important indicator of entrepreneurial ability as well. Some

studies find a positive relationship between entrepreneurship and education (see, e.g., Evans and Jovanovic, 1989; Livanos, 2009; Paulson and Townsend, 2004). On the other hand, higher education could also generate a larger opportunity cost for being an entrepreneur. Several studies indeed show that higher education does have a negative impact on business survival (see, e.g., Nafziger and Terrell, 1996; Nziramasanga and Lee, 2001; Rocha et al., 2015). Although our study does not focus on the role of education, educational level is an important control variable in all specifications.

Our work is also related to the literature on entrepreneurship and financial constraints. There are a number of theoretical models focusing on the role of borrowing constraints on entrepreneurship (see, e.g., Buera, 2009; Evans and Jovanovic, 1989; Giné and Townsend, 2004; Lloyd-Ellis and Bernhardt, 2000). Overall, these models predict that the likelihood of becoming an entrepreneur for an individual depends on the level of his/her prior wealth if his/her borrowing constraints are binding. Most empirical studies find a significant positive relationship between prior wealth and the probability of entrepreneurship (see, e.g., Blanchflower and Oswald, 1998; Block and Sandner, 2009; Evans and Jovanovic, 1989; Paulson and Townsend, 2004). Although the impact of financial constraints on entrepreneurship is not the main focus of our paper, many theoretical and empirical studies show its important role on business entry and exit, we follow the literature to control for prior wealth in all related specifications.

3 Data and Measurement

This paper uses data from a nationally representative Thai Socio-Economic Survey panel, gathered by the National Statistical Office (NSO) of Thailand in 2005, 2006, 2007, 2010 and 2012 (in five waves). The dataset randomly sampled about 6,000 households, resulting in more than 15,000 individuals, all over the country. The survey contains two main parts: 1) household information and 2) individual information. Such information includes age, gender, education, occupation, time spent in the family business and individual income.[1] Our sample

[1]See Chawanote and Barrett (2013) for a more detailed description of the dataset.

contains individuals aged between 15 and 70 years.[2]

A long enough household panel survey allows us to investigate the impact of our interested variables on the likelihood of start and close a new business of the same individuals. The main disadvantage, however, is that the dataset does not contain information on the type and industry of a business and reasons(s) for closing a business. When we observe that individuals are still engaged in business, we do not know that they operate the same business which they started in the previous survey. In the regression analysis (both entrepreneurship and business exit), we choose to present the results from a sample who started businesses in 2007 as a main result, since the results are more robust when there is control for the previous entrepreneurial experience. The results of our interested variables are mainly the same when using the sample who started businesses in 2006.

Measure of Entrepreneurship

This paper measures entrepreneurship using two variables, "main type of job" and "work status". There are eight types of job including 1) farmer/fisherman, 2) production (manufacturing), 3) production (industry), 4) merchant/own-business, 5) government/state enterprise, 6) company/business employee, 7) general worker/laborer and 8) other. Regarding the work status, there are seven groups including 1) employer, 2) self-employed, 3) working for a household business without pay, 4) government employee, 5) state enterprise employee, 6) private enterprise employee, and 7) cooperative group. An entrepreneur or business owner in this paper is defined as an individual whose type of job is "merchant/own business" and whose work status is "employer" and/or "self-employed". Also, individuals have to run a business as their first main occupation to be considered entrepreneurs. We impose this restriction to rule out the side businesses owned by non-entrepreneurs.[3]

[2]Our results are not sensitive to age range. We tried with the 18-65 age group and found that the all main results were still intact.

[3]We also tried to exclude entrepreneurs who worked less than 10 hours per week and/or less than 6 days per month. Those firms contribute less than 3% of total number of the new entrepreneurs. When we impose this further restriction, it causes no change in the level of significance in the regression analysis performed

Our main analysis of entrepreneurship focuses on non-entrepreneurs who can potentially start a business. Non-entrepreneurs include the following: employed individuals who are not entrepreneurs (e.g., wage workers, farmers), unemployed individuals, housewives and inactive individuals (e.g. waiting for the season, retired). For example, an analysis of 2007 survey data uses only individuals who were not entrepreneurs in 2006 data. We also drop individuals who were students in both the 2006 and 2007 surveys. Overall, roughly 5% of non-entrepreneurs moved into entrepreneurial occupations: see Table 1.

Table 1: Occupational Transition from Non-entrepreneur to entrepreneur during 2005-2006 and 2006-2007

Year	Status at the end period	No. of workers	No. of obs.	Percent
2005-2006	Non-entrepreneur		10,136	94.6
	Entrepreneur		574	5.4
		Self-employed	291	50.7
		2-9	256	44.6
		10-50	20	3.5
		more than 50	7	1.2
2006-2007	Non-entrepreneur		10,373	95.3
	Entrepreneur		504	4.7
		Self-employed	266	52.8
		2-9	225	44.6
		10-50	13	2.6
		more than 50	0	0.0

Source: Thai SES Panel data 2005-2007

Note: Number of workers includes a business owner and an unpaid family worker.

in Section 5.

Measure of Firm Size

The survey asks entrepreneurs for the total number of workers in the business, including themselves. The data are classified into seven groups: one worker (self-employed), less than 10 workers (called a small business), 10-50 workers, 51-100 workers, 101-200 workers, 201-500 workers and over 500 workers. We use this information to proxy firm size. Table 1 shows that more than 95% of individuals who become entrepreneurs start their businesses with less than 10 workers. As a result, we dropped new businesses with 10 or more workers, unless stated otherwise. Note also that slightly more than half of the new businesses are self-employed.

Measure of Business Survival

Entrepreneurs are considered as closing their business when they change their occupation to a non-entrepreneurial occupation. Table 2 shows the number of remaining entrepreneurs who recently started a business in 2006 and 2007, respectively. It is clear that the survival rates of all new entrepreneurs in 2006 and 2007 are nearly identical. Approximately half of the new entrepreneurs in 2006 closed their business within one survey year (after we observed that they started a business), and only 20-25% of them survived for more than five or six years (depending on the starting year) and are treated as right censored. Also, similar patterns are found even when we restrict the sample to self-employed and small firms only. Note also that about 10% of remaining entrepreneurs have been left out of the survey during 2007 and the follow-up survey in 2010.[4]

Measure of Family Business Background

We measure family business background using three key variables: (1) a dummy for having an entrepreneur in the household, (2) a dummy for having worked in a family business and (3) number of hours worked in a family business. First, an individual sample will have the value of a dummy, for "having an entrepreneur in the household" variable equal to one, if

[4]The summary statistics of all variable between the sample with and without "Out of survey" group are similar.

Table 2: Business survival of new entrepreneurs by year of entry

Year of Entry	Year of Survey	All sizes		Self-employed and Small Only	
		Remaining Ent.	Out of Survey	Remaining Ent.	Out of Survey
2006	2006	574	0	547	0
	2007	308	0	297	0
	2010	154	42	150	39
	2012	93	0	92	0
2007	2007	504	0	491	0
	2010	187	35	185	33
	2012	107	0	106	0

Source: Thai SES Panel data 2005-2012

Note: Remaining Ent. (for remaining entrepreneurs) is the number of entrepreneurs started during the year of entry that still be in business during the survey year. Out of survey is the number of remaining entrepreneurs in the previous round that were not surveyed in the current round. 'All sizes' include firms with number of workers more than 10.

at least one of the household members (excluding him/herself) was an entrepreneur during the last 12 months, and zero otherwise. Second, an individual sample will have the value of a dummy, for "working in a family owned business" variable equal to one, if he worked in a family business during the last 12 months, and zero otherwise. Third, we use the information on the number of hours individuals work in a family business for the "number of hours worked in a family-owned business" variable and set it equal to zero if the sample either has no entrepreneur in the household or did not help the family business.[5]

Our data show that slightly less than 20% of all samples have an entrepreneur in the household while only 23% of them (about 4% of the total sample) have been working in a family business. Regarding new entrepreneurs, almost 12% of them used to work in a family business with 56 hours per week on average. Note also that the fraction of new entrepreneurs that has been working in a family business and the number of hours for new entrepreneurs

[5]In this study, the definition of family covers only people lived in the same household.

with small firms are clearly higher than the ones with self employed businesses, as shown in Table 3. It is also worth noting that our sample includes not only children of business owners but also their spouses. In fact, approximately 65% of individuals who worked in a family-owned business are spouses while their children account for only 25%.

Table 3: Descriptive statistics regarding family business background

Variable	All Sample	Non-	New-Entrepreneur Only		
		Entrepreneur	All	Self-Employed	Small
Having an entrepreneur in the household	0.194	0.187	0.339	0.305	0.387
	(0.395)	(0.39)	(0.474)	(0.461)	(0.488)
Working in a family business	0.043	0.040	0.123	0.083	0.178
	(0.204)	(0.195)	(0.329)	(0.276)	(0.383)
Working hours in a family business	52.18	51.66	55.61	51.09	58.1
	(17.23)	(17.03)	(18.25)	(15.03)	(19.52)

Source: Thai SES Panel data 2006-2007

Note: A small business has less than 10 workers. The number of hours worked in a family business is calculated from individuals who have been working in a family business as a main occupation. Standard deviations are in parentheses.

Measure of Household Wealth

This paper uses principal component analysis (PCA) to calculate the wealth index of a household. This method helps overcome the limitation of the data, which contain only the values of houses and vehicles. However, in principle, we would need to know the values of a number of assets, for instance, land plots, houses and electrical goods. This study uses the wealth index constructed from 10 types of household assets (selected from 40 types of asset) including the number of televisions, air-conditioning units, fans, mobile phones, telephones, water heaters, computers, Video/Video CD/DVD players, washing machines and bedrooms.

The description of all variables used in this paper is presented in Table A1. Table A2 provides the summary statistics of the variables. The sample is the individuals who are

non-entrepreneurs in 2006 (excludes entrepreneurs and students). The table also shows statistics for all new entrepreneurs (with no more than 10 workers), which are then divided into self-employed (with no employees) and small firm (with 1-9 employees).

4 Model Specifications

This paper estimates the following linear specification:

$$Y_i = \alpha_i + \beta Z_i + \gamma X_i + \epsilon_i \tag{1}$$

where Y_i is the dependent variable of interest, Z_i is a set of family business background variables including a dummy for having an entrepreneur in the household, a dummy for working in a family business, and number of hours worked in a family business, X_i is a set of control variables[6], α_i is the time-invariant unobserved heterogeneity (the individual-specific effect), and ϵ_i is the error term. Our main analysis focuses on the estimation of β.

This paper focuses on two key outcomes including entrepreneurship or starting a new business, and business survival. The observed entrepreneurship outcome Y_i is equal to one if a non entrepreneur individual changes their occupation to entrepreneur in the next year, and zero otherwise. Our main sample consists of non-entrepreneurs in the 2006 survey who make the entry decision in the 2007 survey. With a binary outcome, we therefore analyze this part using the logit model based on the linear specification specified in (1) in this case.[7]

Regarding business closure, Y_i is equal to one if a new entrepreneur changes their occupation to a non-entrepreneurial occupation, and zero otherwise. For example, an entrepreneur is said to close a business within 3 years (within 5 years) if an individual became an entrepreneur in the 2007 survey but did another job in the 2010 survey (still did business in 2010 but changed to another occupation in 2012). Note that our main sample for this part is restricted to new entrepreneurs who started running a business in the 2007 survey. This

[6]The set of controls includes age, age squared, gender, marital status, location (region and area), prior unemployment status, prior household wealth and the highest educational level.

[7]The probit model is also performed and the results are similar with results from the logit model.

approach should mitigate the truncation problem discussed in Millán et al. (2012). Technically, we first employ the logit model based on the linear specification specified in (1). Also, a duration model, namely a random effect discrete-time logit model, is applied as well. In the duration model, we assume that a new business in 2007 survived only one year and only four years if the individual did a non entrepreneurial occupation in 2010 and 2012, respectively.[8] This method takes into account the differences in the time during which each new business is at risk of closing, and allows us to test for unobserved heterogeneity problems, which potentially leads to an estimation bias (Jenkins, 2005).[9]

5 Results

5.1 Entrepreneurship

First, descriptive statistics in Table 3 show that a group of new entrepreneurs has a significantly larger proportion of individuals having a member of household doing business (0.342) and who worked in a family business (0.126) relative to the whole sample (0.194 and 0.044, respectively). Similarly, for the condition of having worked in a family business, new entrepreneurs worked 55.6 hours per week, slightly more than the whole sample (52.2 hours per week). Separating by business size, new small business owners worked 58.1 hours per week, significantly more than the whole sample average. In contrast, the number of hours worked in a family business for new self-employed and non-entrepreneurs are almost identical. These results suggest that both factors should significantly affect entrepreneurship

[8]We need to make an assumption on a year when entrepreneurs close their businesses because we have no information in 2008, 2009 and 2011. For example, if a person became an entrepreneur in 2007 but changed his/her career to non-entrepreneurial occupation again in 2010, then we define the business duration as one year (closing the business one year after we have observed). Similarly, if the new entry started business in 2007 and is still doing business in 2010, but out of business in 2012, then we define the duration of this business as four years. The results are similar even if we assume that the business durations are two and five years, respectively. Note that there is no need to assume any of this for the logit model.

[9]The complementary log-log model is also estimated and it provides similar results.

decision, as confirmed in several formal analyses, especially for new small business owners below.

Table 4 presents the marginal effects for an entrepreneurship decision specification. Consistent with Chlosta et al. (2012); Djankov et al. (2005, 2006); Dunn and Holtz-Eakin (2000); Lindquist et al. (2015), having an entrepreneur in the household has a positive impact on entrepreneurship, as shown in Models 1 to 5. Our results are also in the same line as Fairlie and Robb (2007) in that working hours in a family business significantly increase the likelihood of becoming an entrepreneur, as shown in Models 2 to 5. Furthermore, we find that working hours as a business owner in 2005 also significantly increases the likelihood, as shown in Models 3 and 5. This is consistent with the serial entrepreneur literature (e.g., Chen, 2013; Lafontaine and Shaw, 2014). Note that model 4 excludes ex-business owners from the analysis because including them could lead to an unobserved heterogeneity problem, which is tested using the random effect logistic hazard model in section 5.2

The family business backgrounds of self-employed and small businesses are clearly different, as shown in Table 3. We therefore estimate the marginal effects for self-employed and small businesses separately, and present the results in Table 5. The results show that all of the family business background variables have significant and positive impacts on the decision to start a small business only, as shown in Models 4 to 6.[10] On the contrary, the impact of working hours in a family business is not statistically significant for self-employment, as shown in Models 1 to 3

5.2 Business Survival

Descriptive statistics in Table 6 show that both the fraction of individuals with an entrepreneur in the household and the number of hours having worked in a family business (for individuals who worked in a family business only) increase with the business tenure.

[10] Another different estimation result (shown in Table 5) is the positive impact of prior wealth, which is statistically significant for small businesses only. This suggests that individuals may face a financial constraint when trying to start a small business but not a self-employed business.

Table 4: Marginal effects on entrepreneurship decision in 2007 using the logit model

	Self-employed and Small business				
	(1)	(2)	(3)	(4)	(5)
Having entrepreneur in household	0.0302***	0.0228***	0.0166***	0.0171***	0.0182***
	[0.00399]	[0.00450]	[0.00443]	[0.00422]	[0.00436]
Working hours in a family business		0.000473***	0.000291**	0.000311***	0.000291**
		[0.000115]	[0.000121]	[0.000117]	[0.000122]
Working hours as ex-BO			0.00114***		0.00114***
			[0.0000904]		[0.0000910]
Household wealth	0.00363**	0.00356**	0.00332**	0.00287*	
	[0.00172]	[0.00172]	[0.00167]	[0.00161]	
Control variables	Yes	Yes	Yes	Yes	Yes
Observations	10,875	10,875	10,875	10,391	10,877
Ex-BOs included	Yes	Yes	Yes	No	Yes
Pseudo R^2	0.041	0.045	0.087	0.036	0.086

Source: Thai SES Panel data 2005-2007

Notes: Standard errors are shown in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively. The coefficient results of all variables is presented in Table A3.

Table 5: Marginal effects on entrepreneurship decision in 2007 by firm size using the logit model

	Self-employed business			Small business		
	(1)	(2)	(3)	(4)	(5)	(6)
Having entrepreneur in household	0.0129***	0.00890***	0.00973***	0.00918***	0.00716***	0.00711***
	[0.00330]	[0.00311]	[0.00304]	[0.00270]	[0.00269]	[0.00261]
Working hours in a family business	0.0000461	-0.0000872	-0.0000349	0.000317***	0.000259***	0.000239***
	[0.0000985]	[0.0000983]	[0.000107]	[0.0000588]	[0.0000611]	[0.0000601]
Working hours as Ex-BO		0.000688***			0.000362***	
		[0.0000616]			[0.0000513]	
Household wealth	0.000777	0.000574	0.000365	0.00191**	0.00187**	0.00157*
	[0.00137]	[0.00128]	[0.00128]	[0.000893]	[0.000880]	[0.000839]
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,637	10,637	10,210	10,596	10,596	10,183
Ex-BOs included	No	No	Yes	No	No	Yes
Pseudo R^2	0.028	0.080	0.024	0.083	0.106	0.065

Source: Thai SES Panel data 2005-2007

Notes: Standard errors are shown in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively. The coefficient results of all variables is presented in Table A4.

Table 6: Family background of individuals started a new business in 2007

	Close the business		
	Within 3 years	Within 3-5 years	Not close within 5 years
Having an entrepreneur in the household	0.311	0.342	0.406
	(0.464)	(0.477)	(0.493)
Working hours in a family business	50.4	58.3	60.3
	(19.9)	(23.9)	(13.3)

Source: Thai SES Panel data 2005-2012

Notes: Standard deviations are shown in parentheses.

More formally, we present the estimation results from the logit model of business closure within three years (was a new entrepreneur in 2007 but not an entrepreneur in 2010) and within five years (was a new entrepreneur in 2007 but not an entrepreneur in 2012) in Table 7 and Table 8 respectively.[11] A marginal effect less (greater) than zero means a negative (positive) impact on the likelihood of business closure or a positive (negative) impact on business survival. On the one hand, the results clearly show that simply having an entrepreneur in the household does not decrease the likelihood of closure. In particular, the marginal effects of the variable are not statistically significant in all but one specification. On the other hand, the working hours in a family business have a negative and significant impact on business closure, especially for small businesses, in both cases. That is, an entrepreneur who worked in a family business more in the past is more likely to survive, as shown in Models 5 to 8 in both tables. However, the effect becomes statistically insignificant for self-employment: see Models 1 to 4. It is noteworthy that an experience from being an entrepreneur in the past reduces the likelihood of business closure regardless of the size of the new business.[12]

Next, we show the estimation results using the logistic hazard model with random effect. The results are presented in Table 9 below. The overall findings are similar to the ones using the logit model. That is, simply having an entrepreneur in the household has no significant impact on survival, regardless of the business size. In contrast, the higher the number of working hours in a family business, the higher the chance of survival for small business. However, this is not the case for self-employment.

In addition, we find that the entrepreneurial experience as an ex-business owner has a significant effect on survival. This finding is consistent with Baptista et al. (2007); Millán et al. (2012); Taylor (1999), but contrasts with Cressy (1996); Gimeno et al. (1997); Oberschachtsiek (2012); Van Praag (2003) who find no impact of entrepreneurial experience on survival. Interestingly, the size of the marginal impact of an additional hour helping a fam-

[11] We exclude any individual who left the survey in 2010 from the sample.

[12] Note also that prior household wealth plays no role in the business survival of firms of both sizes in both logit model and logistic hazard model. See Table A7

Table 7: Marginal effects on business closure before 2010 using the logit model (business closure within 3 years)

	Self-employed				Small business			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Having Ent. in HH	-0.00812	-0.0571	-0.0546	-0.0290	-0.0614	0.112	0.175*	0.178
	[0.0771]	[0.0832]	[0.0866]	[0.0959]	[0.0744]	[0.0923]	[0.102]	[0.114]
Working hours in FB		0.00382	0.00529*	0.00353		-0.00617***	-0.00626***	-0.00681***
		[0.00267]	[0.00286]	[0.00278]		[0.00213]	[0.00218]	[0.00254]
Working hours as ex-BO			-0.00517***				-0.00560***	
			[0.00138]				[0.00172]	
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	251	251	251	184	207	207	207	156
Ex-BOs included	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Pseudo R^2	0.069	0.076	0.121	0.090	0.070	0.106	0.142	0.124

Source: Thai SES Panel data 2005-2012

Notes: Standard errors are shown in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively. Ent., HH and FB stand for "entrepreneur", "household" and "family business", respectively. The coefficient results of all variables is presented in Table A5.

Table 8: Marginal effects on business closure before 2012 using the logit model (business closure within 5 years)

	Self-employed				Small business			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Having Ent. in HH	0.0139	0.0133	0.0254	0.0279	-0.0907	0.00545	0.0421	0.0362
	[0.0581]	[0.0637]	[0.0636]	[0.0732]	[0.0573]	[0.0773]	[0.0820]	[0.0772]
Working hours in FB		0.0000428	0.000529	0.000811		-0.00290**	-0.00295**	-0.00284*
		[0.00184]	[0.00177]	[0.00172]		[0.00145]	[0.00144]	[0.00162]
Working hours as ex-BO			-0.00266***				-0.00268**	
			[0.000950]				[0.00112]	
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	251	251	251	184	207	207	207	152
Ex-BOs included	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Pseudo R^2	0.124	0.124	0.151	0.174	0.064	0.085	0.108	0.158

Source: Thai SES Panel data 2005-2012

Notes: Standard errors are shown in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively. Ent., HH and FB stand for "entrepreneur", "household" and "family business", respectively. The coefficient results of all variables is presented in Table A6.

ily business is greater than the impact of the business experience. This again suggests that experience working in a family business does matter.

Table 9: Marginal effects on business closure using the logistic hazard model with random effect (Dependent variable: entrepreneur's status in year t)

	All sample			Self-employed			Small business		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Having Ent. in HH	-0.0102	0.00246	0.0169	-0.0104	-0.0194	0.00168	0.100	0.137	0.0598
	[0.0404]	[0.0678]	[0.0497]	[0.0551]	[0.0880]	[0.0665]	[0.118]	[0.113]	[0.0755]
Working hours in FB	-0.00189*	-0.00255	-0.00221*	0.000538	0.00259	0.00228	-0.00728***	-0.00660***	-0.00411***
	[0.000965]	[0.00166]	[0.00122]	[0.00168]	[0.00281]	[0.00244]	[0.00233]	[0.00216]	[0.00150]
Working hours ex-BO		-0.00415***			-0.00437***			-0.00514***	
		[0.00147]			[0.00157]			[0.00186]	
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Duration dummies	3	3	3	3	3	3	3	3	3
Ex-BOs included	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
N individuals	491	491	367	266	266	197	225	225	170
N observations	782	782	546	425	425	294	357	357	252
ρ	0.00002	0.500	0.000008	0.00002	0.762	0.000008	0.877*	0.887**	0.00004
p-value for $\rho = 0$	0.496	0.177	0.497	0.498	0.19	0.498	0.055	0.032	0.498

Source: Thai SES Panel data 2005-2012

Note: Standard errors are shown in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. The p-value for $\rho = 0$ is calculated from the log likelihood ratio test. Ent., HH and FB stand for "entrepreneur", "household" and "family business", respectively. The coefficient results of all variables is presented in Table A7.

As discussed earlier, the logistic hazard model with random effect can avoid the drawbacks of the binary model and take into account an unobserved heterogeneity problem. The test statistics ρ and p-value of its likelihood ratio test are reported in the last two rows of Table 9. The unobserved heterogeneity problem is significant for the small business case when ex-business owners are included, as shown in Models 7 and 8.[13] This problem of unobserved heterogeneity can be mitigated by excluding ex-business owners from the sample. As shown in Model 9, the test statistics ρ become insignificant once they are excluded. That is why

[13]This is in line with a study by Rocha et al. (2015) in which the unobserved heterogeneity problem arises when the model includes serial entrepreneurs.

we always present a model with ex-business owners excluded to ensure the robustness of the results.

All the results so far confirm that individuals who have experience helping their family business are more likely to start their own business, and have a higher chance of surviving longer in business. Our results are consistent with Fairlie and Robb (2007), who primarily focus on child parent relations. It is noteworthy that our study is not restricted to children helping in parent-owned businesses only. In fact, the largest class of individuals who helped in a family business is the group of spouses helping each other, which accounts for more than 65%. We also restricted the sample to individuals who had their spouse as an owner of a family member only, and the result is presented in Table A8. The impact of working hours in a family business on the likelihood of business closure is still statistically significant and strong for the survival of small businesses.

Unfortunately, we cannot be conclusive on whether the mechanism behind that finding comes from learning by doing or innate ability. Nevertheless, we find one suggestive piece of evidence pointing towards the learning by doing explanation. It is based on the idea that if it was the effect of innate ability, then it should not matter when individuals stopped helping a family business before they started their own business. In contrast, we find that the impact of the number of hours working in a family business play no role when individuals used to help a family business in 2005 (at $t-2$) but did not do it in 2006 (at $t-1$). The impact is statistically significant only when individuals helped a family business a year before they started their business, regardless of whether individuals helped a family business in both 2005 and 2006 or only 2006; see Table 10. In other words, the impact of prior experience helping in a family business depreciates in a short period of time, which is in support of the learning by doing explanation (Parker, 2013). These findings seem to support the view that business human capital can be gained by practicing.

Table 10: Marginal effects of depreciation of business experience on business closure using the logistic hazard model with random effect (Dependent variable: entrepreneur's status in year t)

	Small business		
	(1)	(2)	(3)
Working hours in a family business at t-1	-0.00649***	-0.00404***	
	[0.00219]	[0.00151]	
Working hours in a family business at only t-2	0.00177	0.000803	0.000791
	[0.00517]	[0.00282]	[0.00281]
Working hours in a family business at t-1			-0.00386**
for individuals worked at t-1 & t-2			[0.00157]
Working hours in a family business at t-1			-0.00510*
for individuals worked at t-1 only			[0.00287]
Control variables	Yes	Yes	Yes
Ex-BOs included	Yes	No	No
N individuals	225	170	170
N observations	357	252	252
ρ	0.887**	0.00033	0.00002
p value of LL-ratio test of $\rho = 0$	0.031	0.496	0.499

Source: Thai SES Panel data 2005-2012

Note: Standard errors are shown in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. The coefficient results of all variables is presented in Table A10.

6 Conclusions

This paper has investigated the effects of having a family business background on individuals' decision to start a new business (self-employed and small business) and the likelihood of survival after they started. Using a national representative sample of Thai households, the dataset allows us to distinguish the impact of simply having an entrepreneur family member and the number of hours worked in a family-owned business.

Regarding the decision to start a business, our results suggest that individuals who had a member of a household doing business are more likely to start their own businesses, regardless of whether they worked in a family business. Also, conditional on having an entrepreneur family member, a higher number of hours working in a family business significantly increases the probability of individuals starting a small business but not a self-employed business.

Regarding the likelihood of survival in the new business, in contrast, we find no supporting evidence that simply being a family member of an entrepreneur increases the survival rate. Only individuals who work in a family business are likely to survive in their own small businesses. The unobserved heterogeneity problem that occurs was mitigated by excluding individuals who are serial entrepreneurs from the sample. After doing so, we found that the impact of working hours in a family business remains significantly negative on the likelihood of business closure. The impact remains strong even when we include only spouses of business owners into the analysis. The fact that the effect is temporary and depreciates over time suggests that business human capital can be learned by practicing in a family-owned business.

If the goal of policy makers is to promote new small businesses with a high rate of survival, providing opportunities for individuals who have no business experience to get internships or apprenticeship-type training in a small-sized firm should be seriously considered.

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Appendix

Table A1: Description of the variables

Variables	Description
Entrepreneurship	Dummy for non-entrepreneur who change occupation to entrepreneur (equal to 0 if remain non-entrepreneur)
Business closure	Dummy for entrepreneur who close a business (equal to 0 if remain entrepreneur)
Having an entrepreneur in the household[a]	Dummy for an individual who has at least one entrepreneur as household member
Working hours in a family business[a]	Number of hours an individual help/work in business of household member
Working hours as ex-BO[a]	Number of working hours of an individual who was entrepreneur in 2005
Unemployment[a]	Dummy for an individual who has been unemployed
Education[a]	Dummy variable of educational level that individual achieved. No degree is a baseline and = 0 primary education = 1, secondary education = 2, vocational education = 3, bachelor degree or above = 4
Household wealth[a]	Household wealth index of is estimated from 10 categories of household assets using the Principal Component Analysis
Age[a]	Age of an individual in years
Age squared[a]	Squared age of an individual
Female	Dummy for an individual who is female
Marital status[a]	Dummy for an individual who is married
Rural[ab]	Dummy for an individual lived in rural area (baseline is individual lived in urban area)
Region[ab]	5 Dummies for region: Bangkok metropolitan (baseline), Central, North, Northeast and South
Small-sized business	Dummy for size of a business at the beginning: self-employed = 0, small business (1-9 employee) = 1
Duration dummies	Dummies for 1st, 4th and 5th years in business number of years that nascent entrepreneur survived in the business

[a] Measured in the survey year before the individual start a business.

[b] In the survival analysis, the location is the location that a new business located.

Table A2: Summary statistics of key variables

Variable	All Sample	Non-Entrepreneur	New-Entrepreneur Only		
			All	Self-Employed	Small
	N=10,877	N=10,386	N=491	N=266	N=225
Having an entrepreneur in the household	0.194	0.187	0.342	0.305	0.387
	(0.395)	(0.39)	(0.475)	(0.461)	(0.488)
Worked in a family business (Dummy)	0.043	0.040	0.126	0.083	0.178
	(0.204)	(0.195)	(0.332)	(0.276)	(0.383)
Working hours in a family business	2.269	2.047	7.022	4.226	10.329
	(11.231)	(10.632)	(19.58)	(14.72)	(23.706)
Worked as ex-BO (Dummy)	0.044	0.035	0.253	0.259	0.244
	(0.206)	(0.183)	(0.435)	(0.439)	(0.431)
Working hours as ex-BO	2.247	1.730	13.014	14.060	11.778
	(11.124)	(9.76)	(24.457)	(25.807)	(22.751)
Age	41.978	41.965	42.277	41.748	42.902
	(13.898)	(13.972)	(12.293)	(12.375)	(12.193)
Female	0.540	0.542	0.519	0.602	0.422
	(0.498)	(0.498)	(0.5)	(0.491)	(0.495)
Marital status	0.718	0.714	0.802	0.748	0.867
	(0.45)	(0.452)	(0.399)	(0.435)	(0.341)
Bangkok	0.207	0.207	0.207	0.207	0.142
	(0.405)	(0.405)	(0.405)	(0.406)	(0.35)
Central	0.200	0.200	0.212	0.226	0.196
	(0.4)	(0.4)	(0.409)	(0.419)	(0.398)
North	0.191	0.191	0.198	0.192	0.204
	(0.393)	(0.393)	(0.399)	(0.394)	(0.404)
Northeast	0.290	0.291	0.259	0.267	0.249
	(0.454)	(0.454)	(0.438)	(0.443)	(0.433)
South	0.112	0.110	0.155	0.109	0.209
	(0.316)	(0.314)	(0.362)	(0.312)	(0.407)
Rural	0.620	0.622	0.585	0.571	0.600
	(0.485)	(0.485)	(0.493)	(0.496)	(0.491)
Unemployment	0.022	0.021	0.039	0.038	0.040
	(0.146)	(0.144)	(0.193)	(0.191)	(0.196)
Household wealth	2.364	2.361	2.406	2.372	2.445
	(1.332)	(1.336)	(1.193)	(1.238)	(1.139)
No education	0.312	0.201	0.334	0.342	0.324
	(0.463)	(0.401)	(0.472)	(0.475)	(0.469)
Primary education	0.339	0.338	0.365	0.372	0.356
	(0.473)	(0.473)	(0.482)	(0.484)	(0.48)
Secondary education	0.176	0.175	0.196	0.195	0.196
	(0.381)	(0.38)	(0.397)	(0.397)	(0.398)
Vocational education	0.063	0.063	0.063	0.041	0.089
	(0.243)	(0.243)	(0.243)	(0.199)	(0.285)
Bachelor degree or above	0.109	0.112	0.043	0.049	0.036
	(0.311)	(0.315)	(0.203)	(0.216)	(0.186)

Source: Thai SES Panel data 2005-2007

Note: Standard deviations are shown in parentheses.

Table A3: Estimation coefficients on entrepreneurship decision in 2007 using the logit model

	Self-employed and Small business				
	(1)	(2)	(3)	(4)	(5)
Having an entrepreneur in the household	0.794***	0.602***	0.468***	0.563***	0.509***
	[0.106]	[0.120]	[0.125]	[0.140]	[0.123]
Working hours in a family business		0.0125***	0.00820**	0.0102***	0.00815**
		[0.00301]	[0.00340]	[0.00382]	[0.00341]
Working hours as ex-BO			0.0319***		0.0320***
			[0.00229]		[0.00229]
Primary education	-0.0627	-0.0729	-0.0245	0.0550	-0.0211
	[0.112]	[0.113]	[0.117]	[0.129]	[0.117]
Secondary education	-0.123	-0.133	-0.137	-0.103	-0.0990
	[0.144]	[0.145]	[0.150]	[0.170]	[0.149]
Vocational education	-0.383*	-0.369*	-0.344	-0.210	-0.256
	[0.216]	[0.215]	[0.226]	[0.247]	[0.221]
Bachelor or above	-1.298***	-1.277***	-1.128***	-1.321***	-0.982***
	[0.252]	[0.252]	[0.256]	[0.305]	[0.239]
Unemployment	0.876***	0.926***	0.846***	0.777**	0.835***
	[0.261]	[0.260]	[0.271]	[0.309]	[0.271]
Household wealth	0.0954**	0.0939**	0.0935**	0.0946*	
	[0.0455]	[0.0457]	[0.0472]	[0.0535]	
Age	0.112***	0.106***	0.0888***	0.0865***	0.0891***
	[0.0240]	[0.0239]	[0.0243]	[0.0268]	[0.0243]
Age squared	-0.00132***	-0.00125***	-0.00108***	-0.00111***	-0.00108***
	[0.000276]	[0.000275]	[0.000280]	[0.000310]	[0.000280]
Female	-0.134	-0.172*	-0.133	-0.0950	-0.126
	[0.0937]	[0.0944]	[0.0968]	[0.108]	[0.0967]
Married	0.311**	0.293**	0.219*	0.362**	0.218*
	[0.128]	[0.128]	[0.128]	[0.145]	[0.128]
Rural	-0.337***	-0.311**	-0.260**	-0.176	-0.287**
	[0.120]	[0.121]	[0.124]	[0.143]	[0.123]
Region	5 regions	5 regions	5 regions	5 regions	5 regions
Constant	-5.815***	-5.683***	-5.427***	-5.519***	-5.181***
	[0.516]	[0.515]	[0.522]	[0.576]	[0.511]
Observations	10,875	10,875	10,875	10,391	10,877
Ex-BOs included	Yes	Yes	Yes	No	Yes
Pseudo R^2	0.041	0.045	0.087	0.036	0.086
Log likelihood	-1956.4	-1948.2	-1862.2	-1566.0	-1864.5
χ^2	180.5	207.2	407.9	129.2	408.8

Source: Thai SES Panel data 2005-2007

Notes: Standard errors are shown in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

Table A4: Estimation coefficients on entrepreneurship decision in 2007 by firm size using the logit model

	Self-employed business			Small business		
	(1)	(2)	(3)	(4)	(5)	(6)
Having an entrepreneur in the household	0.598***	0.460***	0.577***	0.631***	0.508***	0.594***
	[0.155]	[0.161]	[0.182]	[0.186]	[0.190]	[0.219]
Working hours in a family business	0.00214	-0.00451	-0.00207	0.0218***	0.0183***	0.0199***
	[0.00457]	[0.00510]	[0.00633]	[0.00390]	[0.00425]	[0.00485]
Working hours as ex-BO		0.0355***			0.0257***	
		[0.00273]			[0.00320]	
Primary education	-0.0670	-0.0240	0.0473	-0.163	-0.116	-0.0319
	[0.150]	[0.156]	[0.173]	[0.169]	[0.172]	[0.194]
Secondary education	-0.144	-0.168	-0.239	-0.206	-0.197	-0.0590
	[0.195]	[0.200]	[0.239]	[0.213]	[0.219]	[0.245]
Vocational education	-0.833**	-0.786**	-0.451	-0.133	-0.139	-0.0594
	[0.342]	[0.354]	[0.358]	[0.290]	[0.299]	[0.348]
Bachelor or above	-1.260***	-1.084***	-1.247***	-1.409***	-1.275***	-1.382***
	[0.333]	[0.339]	[0.402]	[0.394]	[0.400]	[0.462]
Unemployment	0.832**	0.753**	0.977***	1.144***	1.039***	0.546
	[0.345]	[0.373]	[0.370]	[0.374]	[0.377]	[0.538]
Household wealth	0.0361	0.0296	0.0216	0.131**	0.133**	0.131*
	[0.0638]	[0.0661]	[0.0761]	[0.0611]	[0.0624]	[0.0694]
Age	0.113***	0.0917***	0.0716**	0.0926**	0.0819**	0.0981**
	[0.0306]	[0.0312]	[0.0334]	[0.0373]	[0.0375]	[0.0437]
Age squared	-0.00137***	-0.00115***	-0.000944**	-0.00107**	-0.000973**	-0.00126**
	[0.000353]	[0.000362]	[0.000387]	[0.000428]	[0.000431]	[0.000507]
Female	0.223*	0.274**	0.279*	-0.569***	-0.529***	-0.451***
	[0.130]	[0.132]	[0.150]	[0.143]	[0.144]	[0.162]
Married	0.0262	-0.0551	0.118	0.781***	0.689***	0.812***
	[0.156]	[0.157]	[0.178]	[0.230]	[0.230]	[0.254]
Rural	-0.336**	-0.278*	-0.192	-0.295*	-0.263	-0.156
	[0.167]	[0.168]	[0.199]	[0.173]	[0.176]	[0.204]
Region	5 regions	5 regions	5 regions	5 regions	5 regions	
Constant	-5.937***	-5.640***	-5.410***	-6.947***	-6.757***	-7.134***
	[0.678]	[0.688]	[0.756]	[0.787]	[0.784]	[0.902]
Observations	10,637	10,637	10,210	10,596	10,596	10,183
Ex-BOs included	Yes	Yes	No	Yes	Yes	No
Pseudo R^2	0.028	0.080	0.024	0.083	0.106	0.065
Log likelihood	-1208.5	-1144.2	-949.9	-999.3	-973.7	-808.3
χ^2	72.67	268.1	50.23	226.2	302.5	166.4

Source: Thai SES Panel data 2005-2007

Notes: Standard errors are shown in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

Table A5: Estimation coefficients on business closure before 2010 using the logit model (business closure within 3 years)

	Self-employed				Small business			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Having Ent. in HH	-0.0343	-0.241	-0.231	-0.136	-0.254	0.463	0.728*	0.804
	[0.326]	[0.352]	[0.367]	[0.450]	[0.309]	[0.382]	[0.425]	[0.516]
Working hours in FB		0.0162	0.0224*	0.0165		-0.0256***	-0.0261***	-0.0307***
		[0.0113]	[0.0121]	[0.0130]		[0.00878]	[0.00909]	[0.0114]
Working hours as ex-BO			-0.0219***				-0.0233***	
			[0.00585]				[0.00722]	
Primary education	0.459	0.474	0.467	0.500	-0.841**	-0.859**	-1.044**	-0.948*
	[0.341]	[0.341]	[0.360]	[0.412]	[0.380]	[0.401]	[0.423]	[0.508]
Secondary education	0.348	0.415	0.586	1.522**	-1.103**	-1.260**	-1.403***	-1.594***
	[0.414]	[0.417]	[0.418]	[0.606]	[0.505]	[0.517]	[0.534]	[0.610]
Vocational education	-0.243	-0.291	-0.579	-0.587	-0.304	-0.299	-0.441	-0.734
	[0.840]	[0.891]	[0.919]	[0.929]	[0.615]	[0.656]	[0.716]	[0.834]
Bachelor or above	-0.962	-1.009	-1.156	-0.556	-1.256	-1.051	-1.232	-0.764
	[0.801]	[0.822]	[0.795]	[0.968]	[0.899]	[0.882]	[0.810]	[0.931]
Unemployment	-0.967	-0.885	-1.184	-1.376*	0.121	0.158	0.397	0.626
	[0.768]	[0.775]	[0.732]	[0.751]	[0.753]	[0.788]	[0.782]	[1.076]
Household wealth	0.0334	0.0362	0.0622	0.0557	0.0311	0.0346	0.0781	-0.0520
	[0.128]	[0.125]	[0.134]	[0.164]	[0.177]	[0.193]	[0.202]	[0.237]
Age	-0.0944	-0.113	-0.0589	-0.0427	-0.0593	-0.0434	-0.0223	-0.0461
	[0.0807]	[0.0815]	[0.0824]	[0.0946]	[0.0732]	[0.0741]	[0.0770]	[0.0838]
Age squared	0.00132	0.00153	0.000982	0.000747	0.000428	0.000205	0.0000298	0.000278
	[0.000942]	[0.000953]	[0.000971]	[0.00112]	[0.000799]	[0.000809]	[0.000842]	[0.000937]
Female	0.0667	0.0200	-0.0838	-0.192	-0.440	-0.228	-0.312	-0.0259
	[0.282]	[0.285]	[0.298]	[0.357]	[0.314]	[0.320]	[0.331]	[0.383]
Married	-0.108	-0.0571	-0.0629	-0.124	0.828*	1.015**	1.163**	1.456**
	[0.381]	[0.384]	[0.405]	[0.486]	[0.429]	[0.467]	[0.470]	[0.579]
Rural	0.855**	0.865**	0.726**	0.686	0.00338	-0.00323	-0.0875	-0.826
	[0.352]	[0.350]	[0.365]	[0.451]	[0.359]	[0.383]	[0.390]	[0.508]
Region	5 regions	5 regions	5 regions	5 regions	5 regions	5 regions	5 regions	5 regions
Constant	0.697	1.053	0.485	0.0952	2.401	1.787	1.532	2.741
	[1.696]	[1.692]	[1.702]	[1.907]	[1.721]	[1.740]	[1.782]	[2.129]
Observations	251	251	251	184	207	207	207	156
Ex-BOs included	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Pseudo R^2	0.069	0.076	0.121	0.090	0.070	0.106	0.142	0.124
Log likelihood	-156.7	-155.6	-148.0	-105.8	-130.7	-125.7	-120.6	-88.64
χ^2	21.21	22.25	34.75	19.19	17.51	22.50	31.26	22.13

Source: Thai SES Panel data 2005-2010

Notes: Standard errors are shown in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

Table A6: Estimation coefficients on business closure before 2012 using the logit model (business closure within 5 years)

	Self-employed				Small business			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Having Ent. in HH	0.0853	0.0815	0.160	0.214	-0.562	0.0342	0.271	0.326
	[0.356]	[0.390]	[0.401]	[0.563]	[0.361]	[0.485]	[0.532]	[0.707]
Working hours in FB		0.000263	0.00333	0.00624		-0.0182**	-0.0190**	-0.0256*
		[0.0113]	[0.0111]	[0.0132]		[0.00910]	[0.00942]	[0.0145]
Working hours as ex-BO			-0.0168***				-0.0173**	
			[0.00610]				[0.00737]	
Primary education	0.411	0.411	0.443	1.156**	-0.434	-0.419	-0.547	-0.377
	[0.400]	[0.401]	[0.416]	[0.528]	[0.451]	[0.464]	[0.468]	[0.771]
Secondary education	0.224	0.225	0.351	1.487**	-0.698	-0.819	-0.948	-1.123
	[0.466]	[0.466]	[0.461]	[0.698]	[0.566]	[0.595]	[0.608]	[0.798]
Vocational education	-0.578	-0.578	-0.797	-0.664	0.0488	0.0618	-0.0154	-0.350
	[0.816]	[0.816]	[0.836]	[0.935]	[0.711]	[0.749]	[0.793]	[1.026]
Bachelor or above	-1.170*	-1.171*	-1.275*	-0.872	-0.599	-0.420	-0.588	-0.683
	[0.680]	[0.680]	[0.669]	[0.877]	[0.963]	[0.982]	[0.996]	[1.339]
Unemployment	-1.374*	-1.372*	-1.620**	-1.719**	-0.402	-0.365	-0.188	0
	[0.712]	[0.716]	[0.689]	[0.750]	[0.886]	[0.902]	[0.869]	[.]
Household wealth	-0.210	-0.210	-0.199	-0.262	-0.138	-0.142	-0.118	-0.257
	[0.140]	[0.140]	[0.150]	[0.183]	[0.192]	[0.205]	[0.209]	[0.273]
Age	-0.110	-0.110	-0.0668	-0.0785	-0.0836	-0.0708	-0.0493	-0.254
	[0.104]	[0.104]	[0.107]	[0.125]	[0.0908]	[0.0931]	[0.0935]	[0.155]
Age squared	0.00155	0.00155	0.00111	0.00115	0.000875	0.000679	0.000491	0.00319*
	[0.00123]	[0.00123]	[0.00127]	[0.00146]	[0.00102]	[0.00104]	[0.00104]	[0.00194]
Female	-0.488	-0.488	-0.575	-0.466	-0.509	-0.335	-0.429	-0.135
	[0.353]	[0.351]	[0.360]	[0.470]	[0.374]	[0.380]	[0.389]	[0.485]
Married	-0.622	-0.621	-0.646	-0.634	0.175	0.299	0.448	0.651
	[0.486]	[0.490]	[0.510]	[0.638]	[0.519]	[0.543]	[0.531]	[0.828]
Rural	0.429	0.430	0.307	0.555	-0.275	-0.322	-0.424	-1.729**
	[0.407]	[0.409]	[0.421]	[0.543]	[0.457]	[0.478]	[0.485]	[0.761]
Region	5 regions	5 regions	5 regions	5 regions	5 regions	5 regions	5 regions	5 regions
Constant	4.093*	4.101*	3.692*	3.316	4.897**	4.503*	4.256*	9.033**
	[2.121]	[2.114]	[2.172]	[2.402]	[2.300]	[2.402]	[2.349]	[3.728]
Observations	251	251	251	184	207	207	207	152
Ex-BOs included	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Pseudo R^2	0.124	0.124	0.151	0.174	0.064	0.085	0.108	0.158
Log likelihood	-120.9	-120.9	-117.2	-76.32	-102.6	-100.3	-97.84	-59.84
χ^2	28.68	28.68	36.40	28.77	12.79	17.06	20.63	20.06

Source: Thai SES Panel data 2005-2012

Notes: Standard errors are shown in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

Table A7: Estimation coefficients on business closure using the logistic hazard model with random effect (Dependent variables: entrepreneur's status in year t)

	All sample			Self-employed			Small business		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Having Ent. in HH	-0.0510	0.0172	0.0845	-0.0551	-0.163	0.00944	0.920	1.414	0.309
	[0.201]	[0.474]	[0.249]	[0.292]	[0.758]	[0.374]	[1.134]	[1.267]	[0.392]
Working hours in FB	-0.00940*	-0.0178	-0.0111*	0.00286	0.0218	0.0128	-0.0670**	-0.0681**	-0.0212***
	[0.00485]	[0.0157]	[0.00619]	[0.00890]	[0.0305]	[0.0138]	[0.0332]	[0.0342]	[0.00819]
Working hours as ex-BO		-0.0290			-0.0367			-0.0530*	
		[0.0210]			[0.0339]			[0.0280]	
Primary education	-0.0602	-0.294	0.0973	0.258	0.564	0.517	-1.699	-2.034	-0.470
	[0.204]	[0.525]	[0.250]	[0.291]	[0.859]	[0.363]	[1.260]	[1.358]	[0.385]
Secondary education	-0.256	-0.544	0.108	0.174	0.807	1.144**	-3.079*	-3.414*	-0.964**
	[0.248]	[0.691]	[0.309]	[0.341]	[1.094]	[0.474]	[1.785]	[1.892]	[0.465]
Vocational education	-0.124	-0.518	-0.215	-0.695	-2.178	-0.860	-0.0696	-0.191	-0.104
	[0.375]	[0.935]	[0.424]	[0.632]	[2.359]	[0.668]	[1.757]	[1.870]	[0.656]
Bachelor or above	-0.706	-1.997	-0.571	-1.193*	-3.311	-1.137	-0.984	-1.190	-0.0443
	[0.442]	[1.689]	[0.553]	[0.643]	[3.223]	[0.806]	[2.608]	[2.701]	[0.998]
Unemployment	-0.617	-1.375	-0.487	-0.853	-2.627	-0.963	-0.0415	0.457	1.193
	[0.422]	[1.292]	[0.502]	[0.643]	[2.733]	[0.674]	[2.185]	[2.317]	[1.199]
Household wealth	-0.0144	0.0600	-0.0259	-0.0535	-0.0261	-0.0725	0.101	0.158	-0.0346
	[0.0739]	[0.188]	[0.0904]	[0.102]	[0.257]	[0.132]	[0.435]	[0.457]	[0.149]
Age	-0.0357	-0.0333	-0.0533	-0.0656	-0.0529	-0.0311	-0.0935	-0.0487	-0.0501
	[0.0423]	[0.0989]	[0.0502]	[0.0684]	[0.173]	[0.0814]	[0.215]	[0.222]	[0.0718]
Age squared	0.000483	0.000645	0.000762	0.000977	0.00128	0.000570	0.000651	0.000308	0.000618
	[0.000473]	[0.00114]	[0.000578]	[0.000787]	[0.00216]	[0.000933]	[0.00232]	[0.00241]	[0.000814]
Female	-0.178	-0.465	-0.200	-0.324	-0.914	-0.457	-0.0279	-0.179	0.0554
	[0.167]	[0.472]	[0.204]	[0.237]	[0.920]	[0.301]	[0.892]	[0.939]	[0.315]
Married	0.0220	0.305	0.244	-0.264	-0.513	-0.173	2.108	2.584	0.700
	[0.214]	[0.556]	[0.268]	[0.296]	[0.838]	[0.379]	[1.515]	[1.661]	[0.462]
Rural	0.272	0.605	-0.151	0.543*	1.319	0.515	0.350	0.0679	-0.725*
	[0.198]	[0.644]	[0.258]	[0.287]	[1.378]	[0.370]	[1.084]	[1.129]	[0.418]
Small-sized business	-0.00306	-0.282	-0.0617						
	[0.172]	[0.458]	[0.208]						
Region	5 regions	5 regions	5 regions	5 regions	5 regions	5 regions	5 regions	5 regions	5 regions
Duration dummies	3	3	3	3	3	3	3	3	3
N individuals	491	491	367	266	266	197	225	225	170
N observations	782	782	546	425	425	294	357	357	252
Ex-BOs included	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
ρ	0.0000221	0.500	0.00000828	0.0000248	0.762	0.00000847	0.877	0.887	0.0000407
p value of LL-ratio test of $\rho = 0$	[0.497]	[0.273]	[0.497]	0.498	0.19	0.498	0.055	0.032	0.498

Source: Thai SES Panel data 2005-2012

Notes: Standard errors are shown in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

Table A8: Marginal effects on business closure using the logistic hazard model with random effect: the sample is restricted to individuals who had their spouse as an owner of a family member only

	Self-employed business			Small business		
	(1)	(2)	(3)	(4)	(5)	(6)
Having Ent. in HH	-0.00624	-0.0144	0.00817	0.0880	0.127	0.0545
	[0.0552]	[0.0869]	[0.0675]	[0.117]	[0.116]	[0.0772]
Working hours in FB	-0.00218	-0.00147	0.000600	-0.00810***	-0.00730***	-0.00439**
	[0.00216]	[0.00322]	[0.00332]	[0.00258]	[0.00255]	[0.00175]
Working hours as ex-BO		-0.00457***			-0.00489**	
		[0.00147]			[0.00194]	
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Duration dummies	3	3	3	3	3	3
N individuals	258	258	192	215	215	162
N observations	415	415	287	337	337	235
Ex-BOs included	Yes	Yes	No	Yes	Yes	No
ρ	0.00002	0.776	0.000004	0.844	0.871	0.00001
p value of LL-ratio test of $\rho = 0$	0.498	0.165	0.499	0.131	0.072	0.497

Source: Thai SES Panel data 2005-2012

Note: Standard errors are shown in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. The p-value for $\rho = 0$ is calculated from the log likelihood ratio test. Ent., HH and FB stand for "entrepreneur", "household" and "family business", respectively.

Table A9: Estimation coefficients on business closure using the logistic hazard model with random effect: the sample is restricted to individuals who had their spouse as an owner of a family member only

	Self-employed business			Small business		
	(1)	(2)	(3)	(4)	(5)	(6)
Having an entrepreneur in the household	-0.0331	-0.127	0.0453	0.740	1.217	0.280
	[0.293]	[0.775]	[0.374]	[1.036]	[1.217]	[0.399]
Working hours in a family business	-0.0116	-0.0129	0.00332	-0.0681*	-0.0702*	-0.0226**
	[0.0115]	[0.0295]	[0.0184]	[0.0387]	[0.0389]	[0.00949]
Worked as BO (hours)		-0.0402			-0.0470*	
		[0.0336]			[0.0279]	
Primary education	0.287	0.720	0.513	-1.391	-1.739	-0.306
	[0.293]	[0.924]	[0.363]	[1.197]	[1.327]	[0.400]
Secondary education	0.209	1.035	1.124**	-2.378	-2.758	-0.784
	[0.346]	[1.203]	[0.479]	[1.706]	[1.827]	[0.488]
Vocational education	-0.459	-1.507	-0.616	0.363	0.117	0.136
	[0.656]	[1.971]	[0.693]	[1.640]	[1.821]	[0.670]
Bachelor or above	-0.989	-2.857	-0.966	-0.917	-1.024	0.0367
	[0.648]	[2.726]	[0.817]	[2.481]	[2.717]	[1.117]
Unemployment	-0.849	-2.696	-0.975	0.102	0.530	1.244
	[0.639]	[2.604]	[0.669]	[1.964]	[2.194]	[1.213]
Household wealth	-0.0832	-0.0935	-0.0665	0.136	0.224	-0.0158
	[0.104]	[0.273]	[0.131]	[0.408]	[0.457]	[0.162]
Age	-0.0617	-0.0575	-0.0303	-0.0281	0.00694	-0.0399
	[0.0692]	[0.181]	[0.0811]	[0.192]	[0.208]	[0.0740]
Age squared	0.000937	0.00136	0.000567	0.000114	-0.000161	0.000596
	[0.000796]	[0.00224]	[0.000931]	[0.00208]	[0.00227]	[0.000836]
Female	-0.265	-0.844	-0.396	0.320	0.169	0.160
	[0.239]	[0.854]	[0.304]	[0.838]	[0.923]	[0.336]
Married	-0.0828	0.0181	-0.0919	2.761	3.150	0.840
	[0.301]	[0.776]	[0.381]	[1.862]	[1.960]	[0.530]
Rural	0.511*	1.269	0.478	0.525	0.262	-0.616
	[0.291]	[1.261]	[0.379]	[1.022]	[1.114]	[0.446]
Region dummies	5 regions	5 regions	5 regions	5 regions	5 regions	5 regions
Duration dummies	3	3	3	3	3	3
N individuals	258	258	192	215	215	162
N observations	415	415	287	337	337	235
Ex-BOs included	Yes	Yes	No	Yes	Yes	No
Log likelihood	-223.7	-218.7	-150.6	-190.5	-187.6	-131.3
ρ	0.00002	0.776	0.000004	0.844	0.871	0.00001
p value of LL-ratio test of $\rho = 0$	0.498	0.165	0.499	0.131	0.072	0.497

Source: Thai SES Panel data 2005-2012

Notes: Standard errors are shown in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

Table A10: Estimation coefficients of depreciation of business experience on business closure using the logistic hazard model with random effect

	Small business		
	(1)	(2)	(3)
Working hours in a family business at t-1	-0.0671*	-0.0209**	
	[0.0345]	[0.00826]	
Working hours in a family business at only t-2	0.0183	0.00415	0.00409
	[0.0543]	[0.0146]	[0.0146]
Working hours in a family business at t-1 for individuals worked at t-1 & t-2			-0.02**
			[0.00850]
Working hours in a family business at t-1 for individuals worked at t-1 only			-0.0264*
			[0.0152]
Having an entrepreneur in the household	1.380	0.299	0.311
	[1.277]	[0.393]	[0.395]
Working hours as ex-BO	-0.0524*		
	[0.0281]		
Primary education	-2.030	-0.469	-0.454
	[1.368]	[0.385]	[0.386]
Secondary education	-3.414*	-0.968**	-0.945**
	[1.909]	[0.465]	[0.468]
Vocational education	-0.164	-0.0909	-0.0966
	[1.868]	[0.658]	[0.658]
Bachelor or above	-1.166	-0.0405	0.0423
	[2.700]	[0.997]	[1.025]
Unemployment	0.477	1.203	1.190
	[2.315]	[1.200]	[1.200]
Household wealth	0.151	-0.0392	-0.0307
	[0.457]	[0.150]	[0.152]
Age	-0.0524	-0.0518	-0.0495
	[0.222]	[0.0721]	[0.0721]
Age squared	0.000359	0.000640	0.000621
	[0.00241]	[0.000819]	[0.000818]
Female	-0.206	0.0494	0.0469
	[0.941]	[0.316]	[0.316]
Married	2.547	0.694	0.645
	[1.666]	[0.463]	[0.477]
Rural	0.0526	-0.732*	-0.720*
	[1.129]	[0.419]	[0.421]
Region dummies	5 regions	5 regions	5 regions
Duration dummies	3	3	3
N individuals	357	252	252
N observations	225	170	170
Log likelihood	-198.5	-140.1	-140.1
ρ	0.887	0.00033	0.00002
p value of LL-ratio test of $\rho = 0$	0.031	0.496	0.499

Source: Thai SES Panel data 2005-2012

Notes: Standard errors are shown in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.