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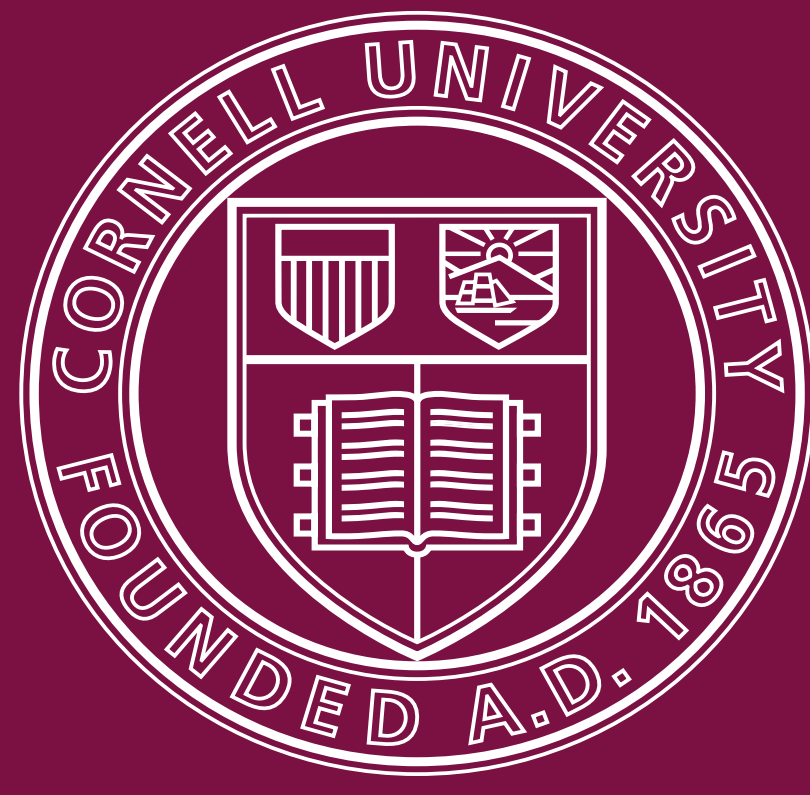
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**Rural Household Non-farm Businesses:  
Startup, Expansion, Contraction, or Exit?**

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# Rural Household Non-farm Businesses: Startup, Expansion, Contraction, or Exit?

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## Introduction

Most household businesses in developing countries are self-employment enterprises without paid employees. These businesses face several constraints, such as access to capital, skilled labor, entrepreneurial ability, and government registry requirements, that limit growth. Self-employment does not automatically lead to enterprise growth and employment creation (Mondragon-Velez and Pena-Parga, 2008; de Mel et al., 2008; Schoar, 2009).

Among push and pull factors for rural households to start and expand a business, one might expect wealth to be the most important factor. Specifically, in the entrepreneurship literature, levels of household wealth often determine the probability of becoming an entrepreneur instead of a wage worker (Evans and Jovanovic, 1989; Banerjee and Newman, 1993; Hurst and Lusardi, 2004; Buera, 2009.)

## Objectives

This study aims to understand the mechanism on the household side behind the entry, the growth process and the contraction of rural non-farm microenterprises and small-medium enterprises in Thailand. It will also explore the characteristics of non-farm household entrepreneurs who expand their businesses by hiring non-family members.

To explain why we observe the limitation of rural non-farm self-employment and microenterprise growth, the models of credit constrained and two-tiered labor market environment are applied. It is very important for policy implication of how we should support rural non-farm enterprises, especially as a key to stimulate rural growth.

## Data

The Thai Socio-Economic Survey (SES) panel data were collected by the National Statistical Office of Thailand in 2005 - 2007, and 2010. The data are restricted to household whose members were employed and lived in rural areas and were younger than 70 years old in all 4 rounds of survey. Results are robust to possible attrition and sample selection problems.

## Acknowledgement

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## Framework & Methods

- ✧ A framework here builds on familiar theories of occupational choice.
- ✧ Normalize household labor endowment to 1 which can be allocated to work on farm ( $L^F$ ), non-farm employee ( $L^W$ ), or run non-farm business ( $L^{NF}$ ). Capital is used either in farm production ( $K^F$ ) or non-farm business production ( $K^{NF}$ ). Credit constraint is present.
- ✧ Profit from non-farm business:

$$\pi_{it+1}^{NF}(l_{it}, L_{it}^{NF}, K_{it}^{NF}) = \max_{L_{it}^{NF}, K_{it}^{NF}} p_{it+1} F(l_{it}, L_{it}^{NF}, K_{it}^{NF}) - w_{it} l_{it} - w_{it}^H L_{it}^{NF} - r K_{it}^{NF}$$

$$\text{s.t. } 0 \leq K_{it}^{NF} \leq A_{it} + s_{it} - K_{it}^F$$

- ✧ Wage working outside household > wage working for household business. MP of household worker > MP of non-family worker
- ✧ A business owner decides how many non-family labors,  $l_t$ , to be hired beside his own family members, and pays wage at  $t$  while receives revenue from operating the business at  $t+1$ .
- ✧ Suppose household utility is a function of consumption,  $c_t$ , and separable in each period. Household budget constraints also reflect whether household starts non-farm (NF) business or not. Then, the household's utility maximization problem is

$$\max_{c_t, l_t^F, l_t^W, l_t^{NF}, K_t^F, K_t^{NF}} u(c) = \sum_{t=0}^{\infty} \beta^t u(c_t),$$

- ✧ Subject to the following constraints,

$$c_{it} + s_{it} = \pi_{it}^F(L_{it}^F, K_{it}^F) + w_{it}^H L_{it}^W - w_{it} l_{it} - w_{it}^H L_{it}^{NF}$$

$$c_{i,t+1} + s_{i,t+1} = \pi_{i,t+1}^{FW}(L_{i,t+1}^F, K_{i,t+1}^F) - \pi_{i,t+1}^{NF}(l_{i,t+1}, L_{i,t+1}^{NF}, K_{i,t+1}^{NF}) - w_{i,t+1}^H L_{i,t+1}^W - w_{i,t+1} l_{i,t+1} - w_{i,t+1}^H L_{i,t+1}^{NF}$$

$$A_{i,t+1} = (1+r)[A_{it} + s_{it}]$$

$$0 \leq K_{it}^F + K_{it}^{NF} \leq A_{it} + s_{it}$$

$$0 \leq L_{it}^F + L_{it}^W + L_{it}^{NF} \leq 1$$

- ✧ Depending on whether household decides to start operating non-farm business by

$$\max_{l_{it}, L_{it}^{NF}, K_{it}^{NF}} \{0, \pi_{it}^{NF}(l_{it}, L_{it}^{NF}, K_{it}^{NF})\}$$

- ✧ Each period the problem is to choose optimal  $l^*$  based on whether profits from starting/expanding business will be positive.
- ✧ For non-farm business production function as  $F(l_{it}, L_{it}^{NF}, K_{it}^{NF}) = \{\alpha L_{it}^{NF} + (1-\alpha)l_{it}\} \cdot f(K_{it}^{NF})$ , we have

$$l_{it}^* = \frac{\partial \pi_{it}^{NF}}{\partial K_{it}^{NF}} \frac{f(K_{it}^{NF})}{f'(K_{it}^{NF}) w_{it}} + \frac{r_{it} - \partial \pi_{it}^{NF} / \partial K_{it}^{NF}}{p_{i,t+1}(1-\alpha) f'(K_{it}^{NF})} - \frac{\alpha L_{it}^{NF}}{(1-\alpha)}$$

- ✧ **Empirical framework:**

- ✧ Probit estimations on having NF business in 2010.
- ✧ Multinomial logit of 4 choices: never having NF business in both 2006&2010, enter in 2010, exit in 2010, and still operating
- ✧ Ordered probit with sample selection (Miranda & Rabe-Hesketh(2006):

$$Y_1 = \begin{cases} 1 & \text{if } X_1' \beta + \varepsilon_1 > 0 \\ 0 & \text{if } X_1' \beta + \varepsilon_1 \leq 0 \end{cases}$$

$$Y_2 = \begin{cases} 0 & \text{if } Y_2^* \leq a_1, \text{ self-employment without employees} \\ 1 & \text{if } a_1 \leq Y_2^* \leq a_2, \text{ microenterprise with } <10 \text{ employees} \\ 2 & \text{if } a_2 \leq Y_2^*, \text{ small-medium sized with } \geq 10 \text{ employees} \end{cases}$$

where  $Y_2^* = X_2' \beta + \varepsilon_2$  if  $Y_1 = 1$ ,  $Y_1 = I[ v = X_1' \beta + \varepsilon_1 ]$

## Results & Discussion

**Transition matrices** in Table 1 shows how NF business status, based on firm size, changes over 2006 and 2010.

- ✧ Most households have never started their own NF business.
- ✧ Almost 40 percent of rural households operated NF businesses at some point in time during this period.
- ✧ The majority of rural NF businesses are self-employed without employees. But more NF employers converted to merely self-employed or reduced the firm size than maintained their status. It is tough to maintain a rural NF business with employees.

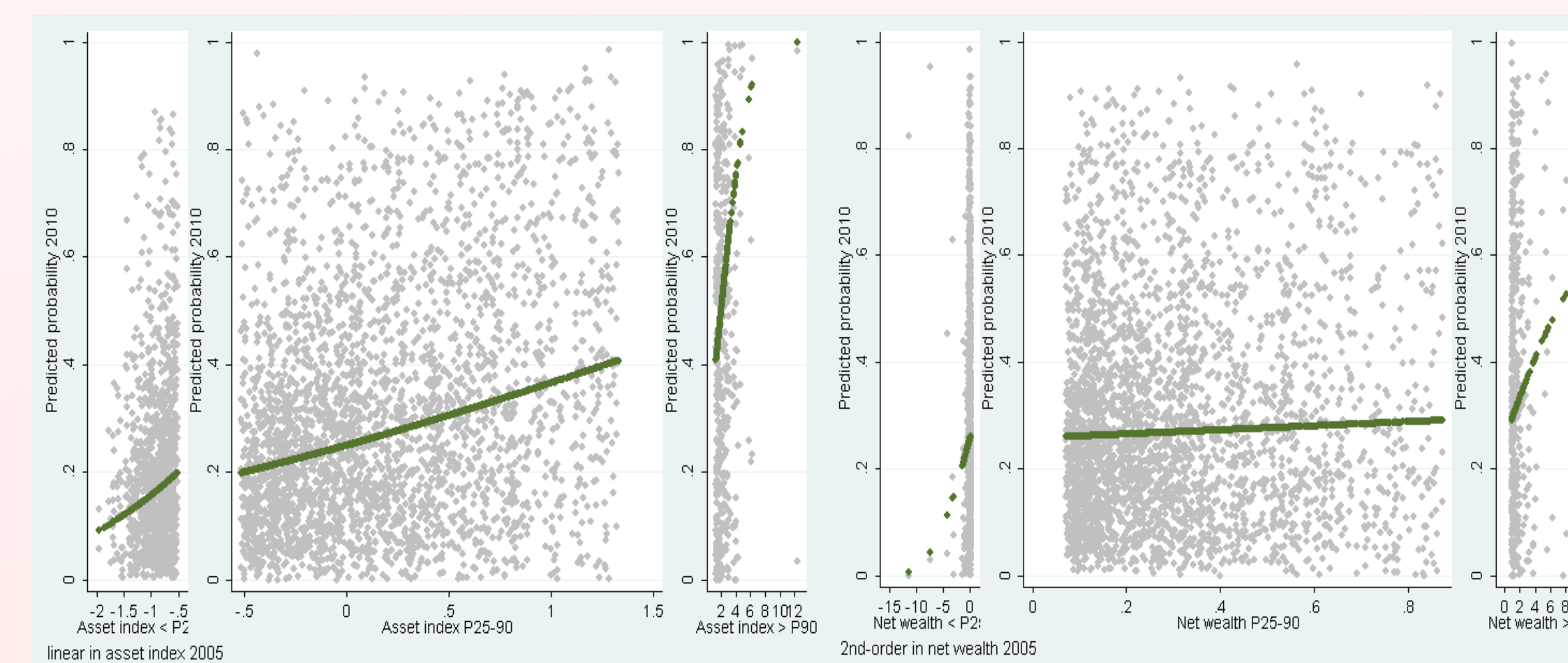
Table1 Transition matrix of NF business status 2006/2010

2006	2010				Total
	No NF business	NF self-employed w/o employee	NF Microenterprise (employees < 10)	NF SME (employees >= 10)	
No NF business	1,356	194	19	3	1,572
Row percentage	86.26	12.34	1.21	0.19	100
NF self-employed w/o employee	186	370	20	3	579
Row percentage	32.12	63.90	3.45	0.52	100
NF Microenterprise (employees < 10)	14	17	24	1	56
Row percentage	25.00	30.36	42.86	1.79	100
NF SME (employees >= 10)	4	1	2	1	8
Row percentage	50.00	12.50	25.00	12.50	100
Total	1,560	582	65	8	2,215
Row percentage	70.43	26.28	2.93	0.36	100

**Probit estimations of operating NF business (in 2010)** on linear in asset/net wealth (in 2005) and on quadratic terms

- Also check robustness with linear probability model >> similar graphs

Predicted probabilities of having NF business in 2010 on (a) asset index 2005 (b) net wealth 2005



Evaluate all other controls, except asset index/net wealth, at their sample means. The scattered gray areas reflect 95% CI predicted probabilities.

- ✧ No wealth effect in the middle range of wealth level:
  - HH may better work for wage employment rather than running NF business.
- ✧ Wealth affects at the lower and high (above 90<sup>th</sup>) wealth level
  - Less entry barriers for low-return NF business (subsistence)
  - Lumpy investment for high-return/growing NF business

**Multinomial logit estimations of changes in NF business status between 2006 and 2010:**

- ✧ Using asset index or net wealth and other control variables (household characteristics, past incomes and labor allocation) in 2005 to avoid potential endogeneity problem
- ✧ Estimate Bi-probit and calculate average marginal effects of P(having NF business 2010 = 1) having NF business 2006 = 1)

Table2 Multinomial logit of change in NF business status 2006/10

	Never have NF business		Enter		Exit		Remain operating	
	Coef.	Std. err.	Coef.	Std. err.	Coef.	Std. err.	Coef.	Std. err.
Asset index05	-0.1121***	0.0151	0.0102	0.0101	0.0034	0.0098	0.0985***	0.0124
Asset index05^2	0.0165***	0.0061	-0.0072	0.0072	0.0047**	0.0019	-0.0140***	0.0049
Agri land (100 rai)	0.0005**	0.0002	-0.0001	0.0002	-0.0000	0.0001	-0.0004*	0.0002
Pseudo R2	0.2157							
Net wealth05 (million baht)	-0.0458***	0.0145	0.0040	0.0080	0.0164	0.0126	0.0254**	0.0125
Net wealth05^2	0.0012	0.0031	-0.0000	0.0014	-0.0005	0.0014	-0.0008	0.0017
Agri land (100 rai)	0.0005**	0.0002	-0.0001	0.0002	0.0001	0.0001	-0.0005*	0.0002
Pseudo R2	0.1952							

Average marginal effects are reported. S.E. are clustered at sub-district level. Number of observations is 2,131.

- ✧ Asset or wealth plays a role in NF entrepreneurship households to maintain their enterprise running (and in quadratic form).
- ✧ Scarcity of agricultural lands and reduction in farm income induce operating NF businesses.

Table3 Two-step ordered probit of NF business status in 2010

Coefficients	2nd stage		1st stage	
	Coef.	Std. err.	Coef.	Std. err.
Asset index05	0.3255**	0.1290	0.3893***	0.0554
Asset index05^2	-0.0182	0.0546	-0.0772***	0.0295
agri land (100 rai)	-0.0015	0.0017	-0.0018**	0.0009
age HH head	0.0542	0.0456	0.0301	0.0188
age^2 HH head	-0.0007	0.0005	-0.0002	0.0002
hmembers	0.0506	0.0436	-0.0723***	0.0247
married	-0.2230	0.1872	0.1322	0.0948
ratio females in HH	-0.0726	0.3525	0.4358**	0.1964
educ: primary	-0.3029	0.2385	0.0326	0.1332
educ: secondary	-0.8890**	0.3488	-0.1522	0.1709
educ: high school	-0.1406	0.3058	-0.2400	0.1744
educ: college/above	-0.5947	0.4419	-0.6558***	0.2358
ratio Lfarm	-0.7202**	0.3530	-1.7533***	0.1622
ratio LNFwkr	-0.7956**	0.3131	-1.7647***	0.1735
ratio LNF w/o pay	0.5088	0.5695	1.6669***	0.3992
farm HH income (10k baht)			-0.2176***	0.0757
wage HH income (10k baht)			-0.0315	0.0345
Formal financial access			-0.0291	0.0729
Informal financial access			0.0013	0.0652
aux: NF business size 2010				
_cut1	2.0624*	1.1648		
_cut2	3.0921***	1.1685		
N. of obs	2169			
Wald chi2 (34)	462.97			

- ✧ Allocation of labors in household are crucial for household to decision on running a NF business.
- ✧ Push factors seem to be main factors to encourage participating in rural NF businesses; hence limitation of enterprise growth.

## Conclusions & Further studies

- ✧ This study finds wealth effects on running NF business at the lower and above 90<sup>th</sup> wealth distribution and on maintaining NF business status. We also observe the reduction in firm size rather than business expansion. It is difficult to see rural NF business growth.
- ✧ Further studies include i) specifying ordered probit estimation in transitions of NF business status given initial status; ii) estimating effects of NF business status on changes in wealth; iii) exploring possible exogenous shock, e.g. rainfall, to mitigate potential endogeneity problem.