How the rural-urban linkages determine the nonfarm activities and incomes of rural household, evidences from five provinces in China

Chaoran Hu [1], huchaoran@msu.edu

Thomas A. Reardon [1], reardon@anr.msu.edu

Songqing Jin [1], jins@anr.msu.edu

Kevin Z. Chen [2], K.Chen@cgiar.org

[1] Department of Agricultural Food and Resource Economics, Michigan State University

[2] Division of Development Strategy and Governance, IFPRI-Beijing

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MICHIGAN STATE UNIVERSITY — FPRI

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Background

• 34%, **51%** and 47% of income of rural household is from nonfarm earnings in Africa, **Asia** and Latin America, respectively (Haggblade, Hazell, and Reardon (2007).

Source: Author calculation based on data from National Bureau of Statistics of China
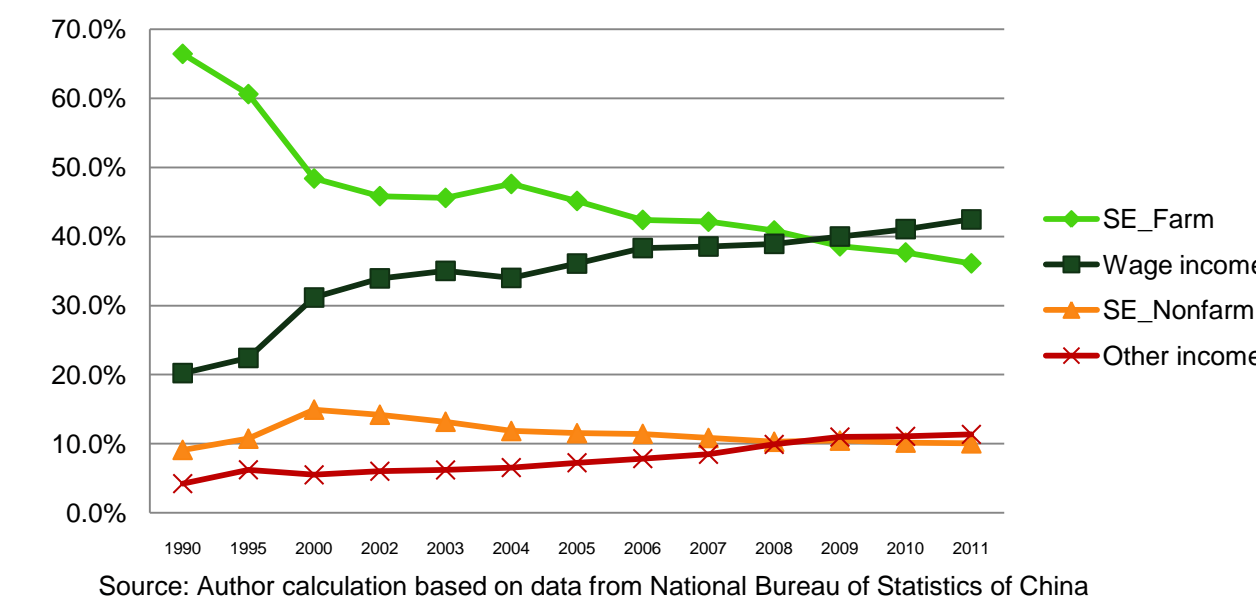
• The importance of **rural-urban linkage** (the production and consumption linkage in rural & urban areas) in nonfarm activity (NFA) is rarely explored.

• **local nonfarm** economy in China is largely neglected in existing literature.

• Heterogeneity of Chinese regions provides a unique opportunity to study the great variation of NFA and its impact on rural households (HH).

Objectives

• Find out the level of rural HH's engagement in various NFA.

• Identify the factors affecting rural HH's participation in NFA and shares of nonfarm income (NFI) from different types of NFA over total NFI.

• Explore the joint impacts of rural agricultural potential and urban demand potential.

Rural-Urban Linkage

• The 5 provinces are representative to the different parts of the country:

• **Heilongjiang** represents the areas with abundant land, good agriculture potential but relatively less NFA;

• **Shandong** represents the areas with good agriculture potential, especially specialized in commercial crops, and active NFA, especially local NFA;

• **Jiangxi**, **Hunan** and **Sichuan** together represent the areas with more intensive agriculture and active migration (as main migration sending provinces).

• Urban demand potential:
  • Shortest distance of each household to seven main cities of China (representing Pearl River Delta, Yangtze River Delta and Jing-Jin-Ji Area)

• Local agricultural potential:
  • Village level average yield of total crops

• Interaction of both variables above:
  • Rural-Urban linkage

• Concerns
  1. Potential endogenous problem of agriculture potential
     • Use previous village level average crop value instead of current value.
  2. Potential selection bias as household's participation in NFA is not random
     • Heckman two-stage model is adopted.

Reduced Form

$$(1) \quad Y_{ij} = \alpha + \beta A_{j,t=2004} + \gamma D_j + (\delta \boxed{A_{j,t=2004} * D_j}) + \theta Z_{ij} + u_{ij}$$

• Y_{ij} equals to 1 if household i in village j has participating in any type of NFA;

• A_j is the village level unit value of total crops in 2004, which is the proxy for agriculture potential;

• D_j is a vector of distance variables;

• Z_{ij} is a vector of HH characteristics.

•, From participation regression of household in any kinds of NFA, inverse mills ratio λ is obtained for the second-stage analyses. (see (2))
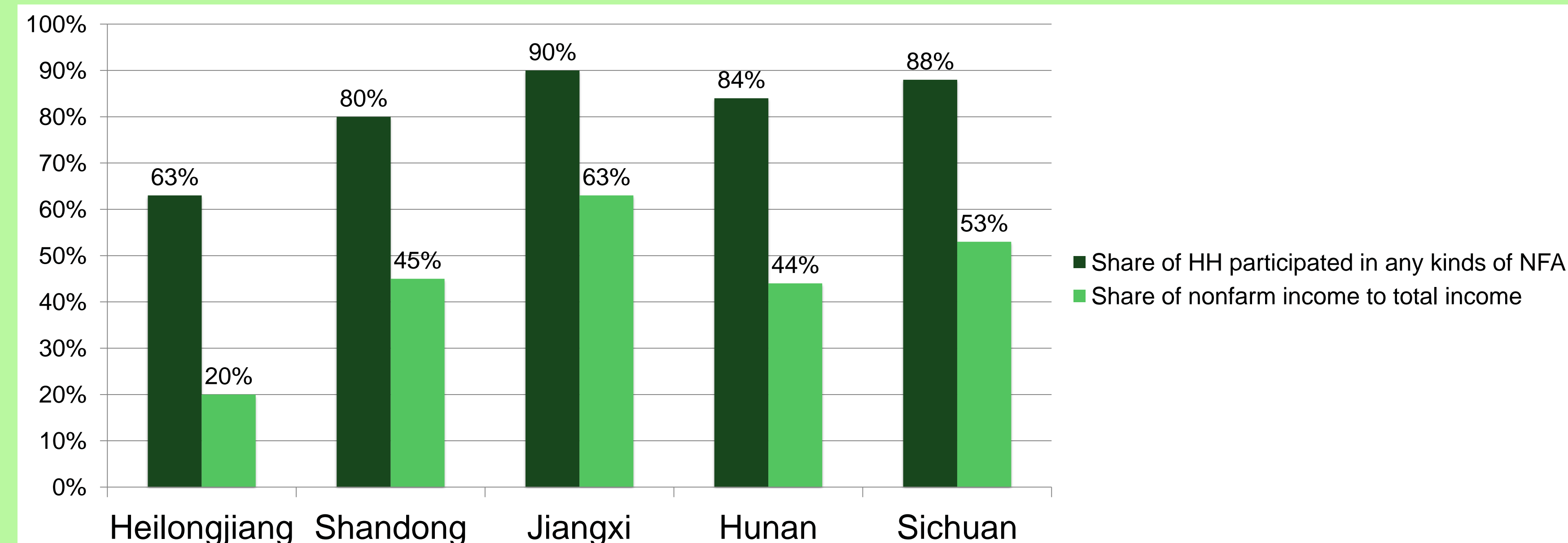
$$(2) \quad S_{ij} = \alpha + \beta A_{j,t=2004} + \gamma D_j + (\delta A_{j,t=2004} * D_j) + \theta Z_{2ij} + \xi \lambda + \varepsilon_{ij}$$

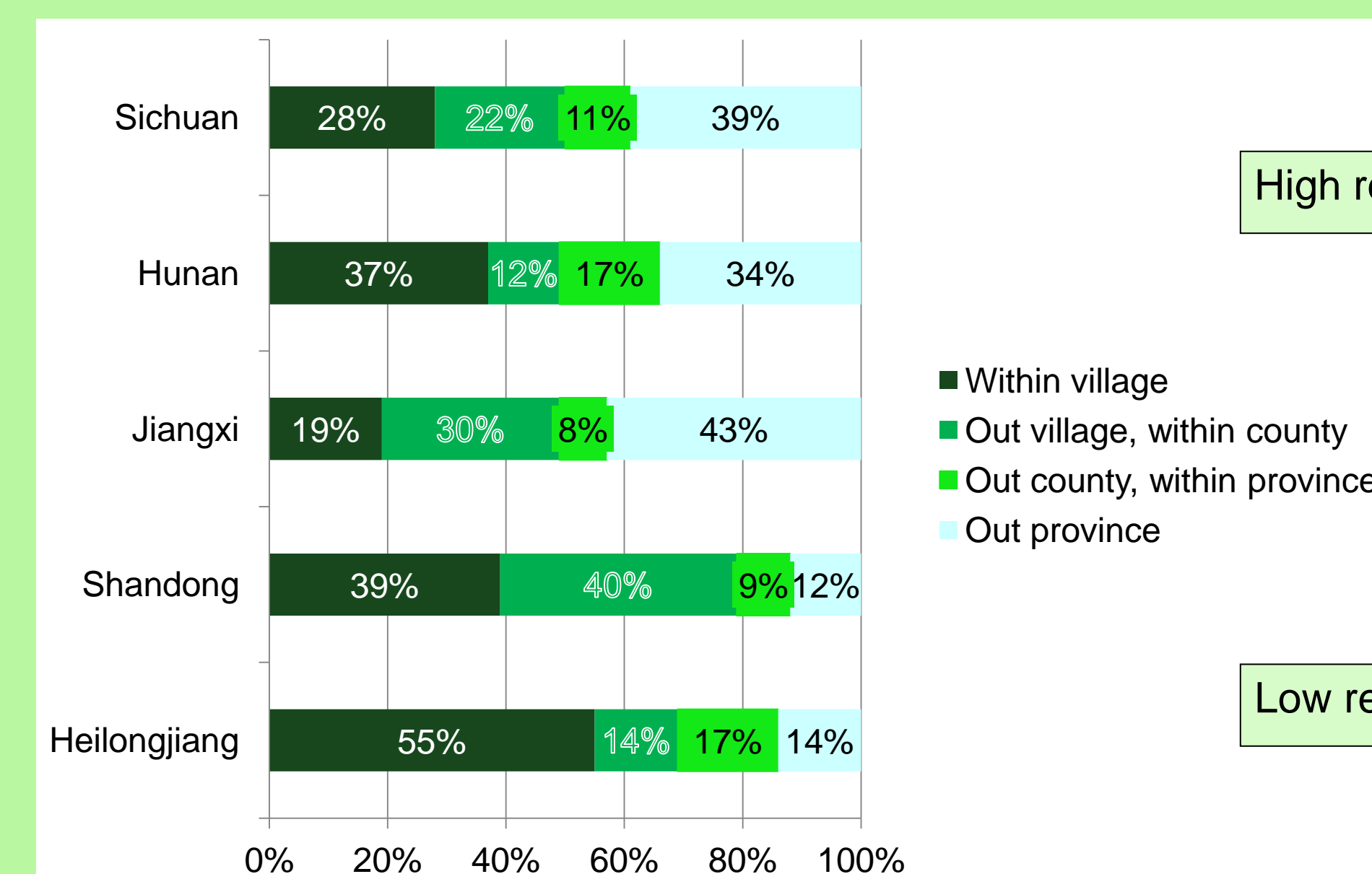• S_{ij} for person i in village j:
  • For participation choice model: equals to 1 if participating in any kind of NFA;
  • For NFI fractional regression: equals to 0~1 from a specific NFA over total HH income.
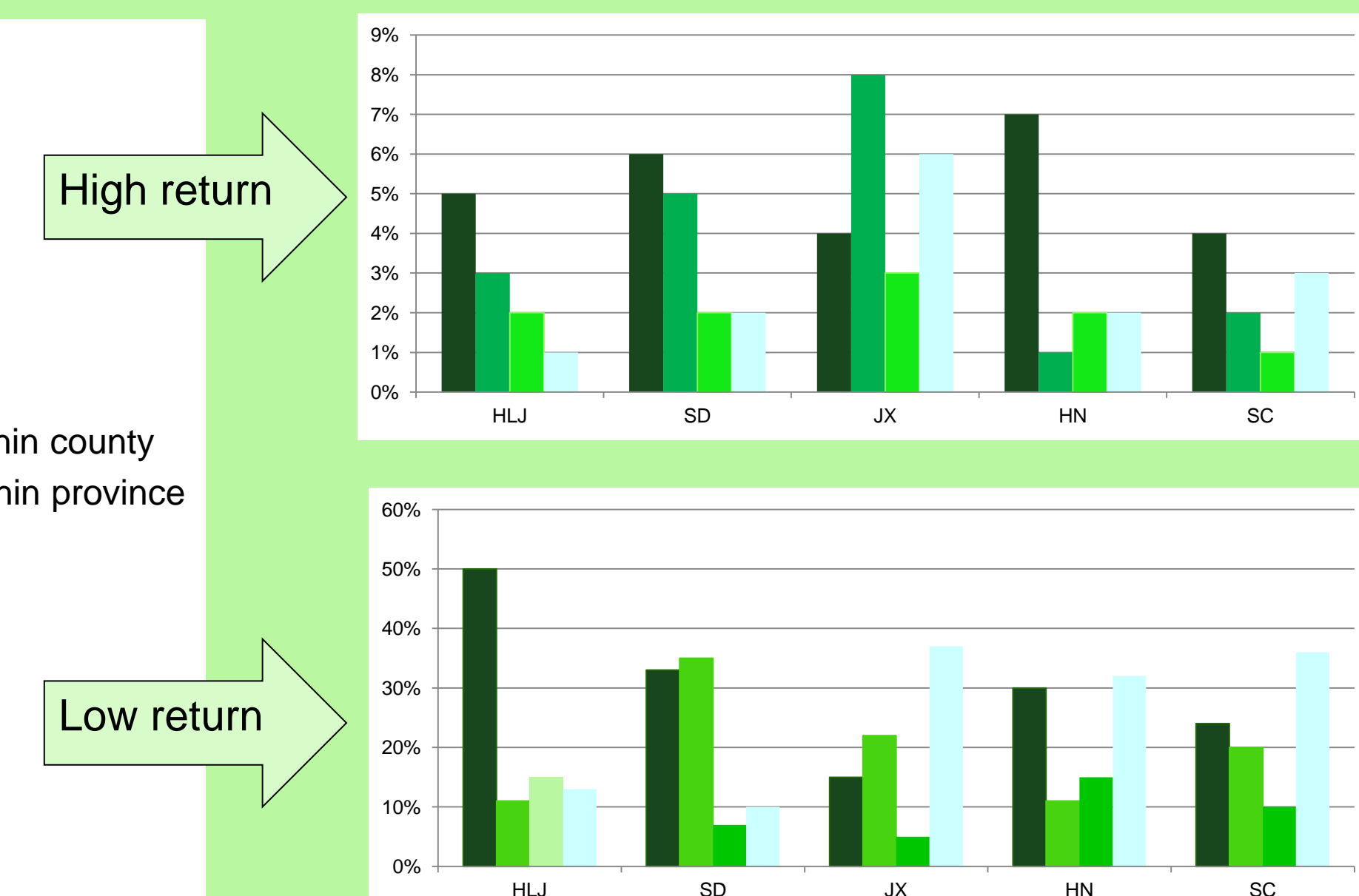
Results

■ Share of HH participated in any kinds of NFA
■ Share of nonfarm income to total income

Distribution of nonfarm income by location

■ Within village
■ Out village, within county
■ Out county, within province
■ Out province

by high & low returned NFA

High return

Low return

Determinants of HH participation in any kind of NFA, 2005-2008

	All		Heilongjiang		Shandong		Jiangxi + Hunan +Sichuan	
	(N=12,905)		(N=3,585)		(N=1,964)		(N=7,356)	
Agriculture (Ag) potential								
Village unit value of total crops in 2004 (100 RMB/mu)	-0.007***	0.007***	-0.044**	0.340***	-0.003	0.008	-0.002***	0.008***
Spatial Characteristics								
Village away from highway (10 km)	-1.071***	0.351	-1.929***	4.252***	-5.090***	-11.913***	0.274	-0.015
Village away from district capital city (DCC) (100 km)	-0.057***	-0.081***	-0.186***	0.255***	-0.147***	0.335**	0.014*	0.02
Village nearest distance to one of the 7 cities (1000 km)	-0.268***	-0.063**	-0.593***	-0.186	0.115	0.009	-0.007	0.131***
Ag. potential * distance to highway		-0.322***	/	-1.611***	/	0.524	/	0.006
Ag. potential * distance to DCC		0.004***	/	-0.142***	/	-0.034***	/	0.001
Ag. potential * distance to major city	/	-0.022***	/	-0.066	/	0.015	/	-0.017**
Household Characteristics	Y	Y	Y	Y	Y	Y	Y	Y
Province dummies	Y	Y						
Year dummies	Y	Y	Y	Y	Y	Y	Y	Y

Turning Point

=* p<0.1, =** p<0.05, =*** p<0.01

Share of NFI over total HH income, by NFA location and return rate

	Heilongjiang				Shandong				Jiangxi + Hunan + Sichuan			
	A		C		A		C		A		C	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Village unit value of total crops **in 2004** (100 RMB/mu)	0.583***	0.156*	0.021	-0.248***	-0.057***	0.040**	-0.007	-0.031**	0.017***	0.014***	0.001	-0.029***
Vlg away from highway (10 km)	3.027***	6.016***	0.579***	-0.206	-13.693***	18.083***	-3.023**	-2.548	5.856***	2.684**	1.780***	-5.801***
Vlg away from district capital city (DCC) (100 km)	0.172**	-0.541***	0.046***	0.501***	0.620***	-0.463**	0.051	-0.035	-0.037	0.176***	-0.100***	0.194***
Vlg nearest distance to one of the 7 cities (1000 km)	0.731***	-0.193	-0.061	-0.299***	-2.423***	1.522***	-0.203	-0.287	-0.009	0.047	0.004	-0.196***
Ag potential*dis to highway	-1.140***	-1.979***	-0.214***	0.31	1.285***	-2.736***	0.584***	0.328	-0.747***	-0.428**	-0.283***	0.788***
Ag potential*dis to DCC	-0.067***	0.085*	-0.020***	-0.097***	-0.056***	0.019	-0.004	0.015	0.000	-0.018***	0.010***	-0.028***
Ag potential*dis to major city	-0.293***	-0.179**	0.011	0.263***	0.214***	-0.092	0.015	0.048	-0.004	0.004	-0.004**	0.027***
Inverse Mills Ratio	0.277***	0.155**	0.045**	-0.217***	0.119	-0.004	-0.068***	-0.062	-0.012	0.309***	-0.084***	-0.618***

1. =* p<0.1, =** p<0.05, =*** p<0.01;   2. HH characteristics, province or year dummies are all controlled;
3. A and C stand for: share of income from local and migration NFA over total income, respectively;   4. High/Low means higher/lower returned NFA.

Conclusions

• NFI is an important source to households in rural China, ranging from 20% to 63% over total household income from Heilongjiang to Jiangxi.

• NFI from local NFA (within county) plays crucial role, ranging from 49% to 79% over total NFI from Jiangxi, Hunan to Shandong.

• Income from low-return NFA far exceeds that form high-return NFA, for all regions, more than 80% of the NFI are from low-paid NFA.

• Household in local areas with better agriculture potential is more likely to engage in local NFA, but less likely to migrate. And local agriculture potential has positive effect participation in higher-return NFA in all areas. on

•Better agriculture potential will help households to increase the share of NFI if they live close to big cities for households in Hunan, Jiangxi or Sichuan, while will increase that share for households in Shandong if they live close to district capital city as migration is dominant in the earlier and local nonfarm economy is flourishing in the latter regions.