

# Financial Expenditures, Risk-sharing and Consumption Smoothing in Rural China

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## Abstract

This research focuses on the risk-sharing system function in rural China and how the village's financial expenditure can help village risk-sharing mechanism and rural economics through the 'new rural construction project' from 2005. This study aims to confirm if the central fiscal allocation reaches each terminal village collections after the tax sharing reform. First, potential risk avoidance ability is considered by examining gross overall consumption and staple food consumption smoothing. Second, the relation of productivity, infrastructure, and social financial expenditures, and risk-sharing are examined. This study examined cases of areas with different economic levels. As a result, central government's public financial expenditures helped to form the households' gross overall consumption smoothing and developed an alternative non-public safety net for resource allocation. Social service expenditure played a role in assisting consumption smoothing for middle and low level villages.

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Keywords: risk-sharing, consumption smoothing, financial expenditure, public safety net, fiscal transfer

## 1. Introduction

Due to imperfect markets, uncertain economy, and undeveloped public safety net, village communities have formed their non-public risk-sharing risk-sharing system to avoid liability (Townsend, 1994). For rural households, the ability to respond to an issue like risk-sharing is known as potential risk correspondence. A risk-sharing system is also a technique to protect a household from poverty. With the current temporal poverty in China, the solution is to maintain stable utilization, providing temporary smoothening of the problem, which is important for raising the consumption level. Also, it is possible that such a system may alter public support.

Regarding risk-sharing system, much research has been accumulated in the study of developing countries and the self-insurance function or public role of rural households, which is examined as a route to achieve risk-sharing system (Townsend, 1994; Ravallion and Chaudhuri, 1997; Dercon and Krishnan, 2000 and 2002, etc.). However, regarding studies on China's risk-sharing systems, there are few studies that fully discuss the situation (Jalan and Ravallion, 1999; Wu and Yao 2014, etc.). Since it is difficult to obtain the village financial situation in detail, there is little data. This research contributes to filling gaps in prior research concerning the role of the village's financial expenditure in building a risk-sharing system. In this study, village financial expenditure does not necessarily focus on inevitable and required expenditure, only discussed elastic and specific expenditure.

## 2. Fiscal System Transformation and Village Financial Structure in China

After the People's Commune in China collapsed, Article IV of the 1991 the 'State Budget Management Ordinance' implemented five-level

governance wherein the township government was the lowest form of administration, and villages were within the township. This fiscal system divides the economic system of China into a dual structure, creating a regional poverty gap. Furthermore, by increasing the non-budgetary income of the 'Local Finance Contracting System' implemented in each region in the 1980s, the financial strength of local governments became stronger but that of the central government did not. To increase the central government function of resource redistribution, the 'Partial Tax System' reform began in 1994.

Since the system focused on central fiscal resources, the local government's financial power weakened. The central government guaranteed farmers' rights by launching a series of policies to prevent village organizations from compensating for the reduced financial income from farmers' taxes. An example can be found public construction in the National People's Congress of 2004, in which Wen Jiabao declared the abolition of agricultural tax aimed to at solving financial problems. Therefore, agricultural tax income, which was a major income source in rural organizations, became almost 0 after 2005 (Table 1). Under this fiscal system, the central government usually accomplish the general and specific

Table 1 Village Average Tax Revenues and Sources

Wave	Total tax amount (million RMB)	Each Tax Ratios(%)					
		Agricultural	Education	Agricultural specialty	VAT	Turnover	Corporate income
2004	2.66	18.78	1.35	0.06	42.73	14.39	22.69
2005	3.56	1.55	1.29	0.01	39.69	12.74	44.72
2006	3.18	-	1.51	-	48.19	15.78	34.52
2007	3.51	-	1.28	0.82	44.17	14.16	39.57
2008	4.58	-	2.81	0.03	42.27	18.87	36.02
2009	3.50	-	-	-	46.11	23.40	30.49
2010	4.12	-	-	-	53.09	20.62	26.29
2011	4.94	-	-	-	54.11	26.36	19.53
2012	5.71	-	-	-	43.54	28.25	28.21

Source) Based on RVS data.

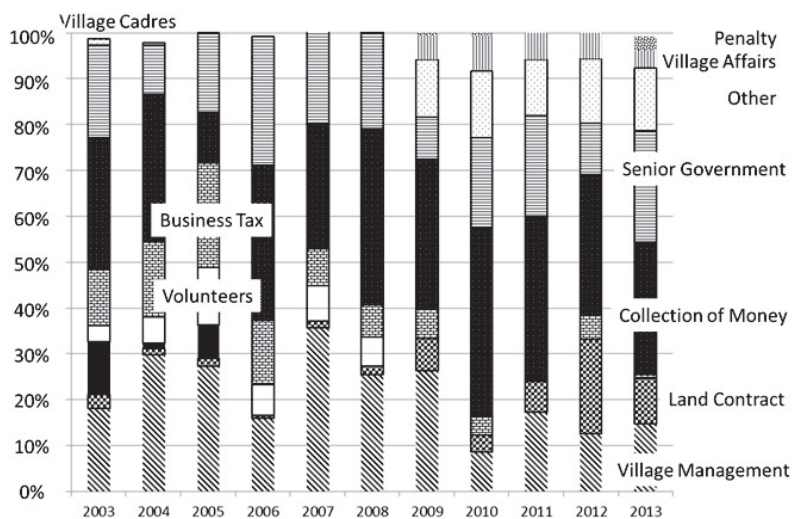
transfers, and tax reimbursement distributed to each region, which corrected economic gaps.

The project is based on the relocation of revenue from central to rural areas. It is also a comprehensive project to adjust the late rural economy and economic development strategy in various fields. Therefore, hard infrastructure and soft infrastructure reforms were instituted in various fields. On the village side, this is commonly reflected as income from the senior government, the second largest income source (Figure 1). In addition, as shown in Figure 2, investment is made in each field through financial expenditure in the form of social service or production services for villages.

### 3. Data

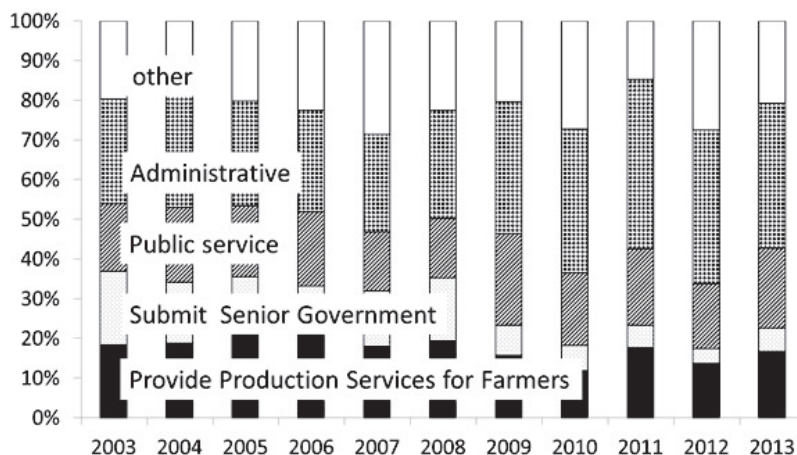
This research uses the Research Center for Rural Economy's household

Figure 1 Village Financial Income Sources Ratio



Source) Same as Table 1.

Figure 2 Village Financial Expenditures Ration



Source) Same as Table 1.

panel and village panel data. The Agriculture Department / Agricultural Economic Research Institute of China, Fixed Observation Point office conducts a nationwide farm household survey (RHS) almost annually since 1986, which covers all provinces and villages' surveys (RVS). It is high-value data that does not concern the financial situation of rural areas. Based on the annual panel data of 2004 – 2012, about 300 to 450 administrative villages and about 20,000 individuals are subjects of a survey year. A total of 127 tracking villages with 10 to more than 100 households in each village were acquired by data cleaning which resulted in a balanced panel data. Among the RHS data, the focus is on the agricultural village. 'Agricultural village' in this study refers to a village where more than 50% of the households are engaged in agriculture. Households can be classified into three types: full-time farm households, households who do farming on the side, and non-farm household.

## 4. Empirical Models

### 4.1 Risk-sharing Estimation Model

This empirical model is based on classical full risk-sharing models (Wilson 1968; Diamond 1967; Mace 1991; Cochrane 1991; Townsend 1994, etc.). Through the use of consumption and income changes data, the consumption elasticity ( $\beta_{iit}$ ) is measured to determine the degree of consumption smoothing and community full risk-sharing mechanism. Officially, the empirical specification that tests community full risk-sharing can be written by Eq.1:

$$\Delta c_{iit} = \alpha_0 + \beta_{iit} \Delta y_i + \alpha_t D_t + u_{iit} \quad (1)$$

$\Delta$  - first time difference operator between periods  $t-1$  and  $t$ .

$c_{it}$  - household member  $i$ 's consumption in time  $t$ , wherein, consumption either means the household average gross overall or staple food consumption.

$y_{it}$  - household member  $i$ 's income in time  $t$ .

$D_t$  - the annual dummy variable. This term is used to control the influence of the macroeconomic effect in the village, which makes it possible to have a more accurate of consumption sensitivity due to shock.

$\alpha$  and  $u$  are constant terms and error terms, respectively.

### 4.2 Village Financial Expenditure Test Model

In the first stage, panel data analysis was carried out, but in the second stage, it was estimated using the village financial expenditure data out of the risk-sharing degree obtained in the first stage and 2012's cross-session data. In addition, the risk-sharing degree ( $\beta_{it}$ ) of each village shows how the

village's financial expenditure affects consumption smoothing on Eq.2. The village's financial expenditure in the 'New Rural Construction Project' can be imagined as a kind of public safety net. In addition, public investment is useful for forming a regional risk-sharing system based on regional economic development. The effect of the village financial expenditure on village risk-sharing is estimated by Eq.2.

$$\beta_{it} = \alpha_j + \theta_j x_p^e + \theta_j x_i^e + \theta_j x_s^e + \delta_j D_E + \varepsilon_j \quad (2)$$

$x_p^e$  - village  $j$ 's productivity financial expenditure.

$x_i^e$  - village  $j$ 's investment financial expenditure.

$x_s^e$  - village  $j$ 's social service financial expenditure.

$D_E$  is a vector indicating externalism of economy and economy levels, etc.

$\alpha$  and  $\varepsilon$  are constant terms and error terms, respectively.

### 4.3 Main Variables Description

**1) Income:** Household net agricultural income per capita includes cash and non-cash income. CPI deflates, based on the Prices Yearbook, using year 2004 as the basis.

**2) Consumption:** the average household consumption per gross capita using modified OECD equivalent. The first adult weighs 1.0. Next, adult weighs 0.5. Children weigh 0.3. Gross overall consumption and staple food consumption data sets were used.

**3) Year dummy:** 1=corresponding year, 0=other years.

**4) Village financial expenditure ratios:** individual financial expenditure, which has three kinds – productivity investment fund (PIF), infrastructure expenditures (IE), and social services expenditures (SSE), against the total village financial expenditure.

**5) Economic level dummy:**

1= above-middle economic level (AMEL) villages, 0=other villages.

1= middle economic level (MEL) villages, 0=other villages.

1= low economic level (LEL) villages, 0=other villages.

The top economic level (TEL) is the benchmark variable.

## 5. Results

To test the degree, an estimate is made of each village based on RHS household data. First step estimation result will not be discussed in detail in here. The full risk-sharing model is statistically rejected in 127 sample villages. TEL and LEL villages had weak risk-sharing systems.

According to the second estimation results in Estimation 1, Table 2 describes the coefficients of IE and SSE which are negative. SSE's coefficient is significant in Table 2. Using the above mentioned individual expenditures and cross term coefficients, one can conclude that village financial expenditure, specially SSE, contributes to regional risk-sharing and can be part of the public safety net. When comparing the effect of SSE among the MEL and LEL areas, the effect on MEL villages ( $-0.695$ ) is higher than the effect on LEL ( $-0.407$ ). If an increase of 1% is put on SSE in MEL, it will have an increase of 0.288 points against the low level. As for IE, it did not get a significant result. However, the result shall not be ignored. To add, it means that if an increase of 1% will be put on IE in the MEL villages ( $-0.499$ ) it will increase 0.148 points than the LEL ( $-0.351$ ). This means that more stable consumption activities may be realized through regional support for social relief, preventive health, and medical care expenditures and by increase expenditures on health care expenses and health expenditures of farm households. Linking large-scale construction for agricultural production might help village household consumption smoothing in MEL villages.



In Estimation 2, the result is interpreted to mean its financial expenditure activities to be carried out and to revitalize the economy. It will rise the regional economic level, thereby raising the quality of life of the farmers' household, who previously bought cheap ingredients. It is probable that the result is caused by higher quality food consumption due to an increase in the standard of living. Therefore, there is the probability of weak effect from farmers' households taking higher quality food through financial expenditure activities that revitalize the economy.

In conclusion, before, households build strong relationship in the community, thus creating a good factor in a non-public, risk-sharing environment. With the economic development, the relationship of families

Table 2 Function of Village Financial Expenditure

	Estimation1			Estimation2		
	Coef.	t-value	P-value	Coef.	t-value	P-value
PIF ratio	5.103	[1.51]	0.134	3.773	[0.92]	0.364
IE ratio	-2.170	[1.34]	0.185	1.299	[0.15]	0.879
SSE ratio	-9.094	[3.11]	0.003 **	5.917	[0.19]	0.847
AMEL	-5.476	[2.91]	0.005 **	3.449	[0.18]	0.857
MEL	-4.834	[2.44]	0.017 **	3.968	[0.21]	0.836
LEL	-5.107	[2.66]	0.010 *	4.260	[0.22]	0.824
PIF × AMEL	-5.441	[1.56]	0.124	-0.776	[0.17]	0.862
IE × AMEL	2.574	[1.54]	0.127	-1.280	[0.15]	0.881
SSE × AMEL	9.245	[3.14]	0.002 **	-5.932	[0.19]	0.847
PIF × MEL	-4.660	[1.33]	0.189	-6.771	[1.45]	0.153
IE × MEL	1.671	[0.91]	0.365	-1.709	[0.20]	0.843
SSE × MEL	8.400	[2.79]	0.007 **	-6.431	[0.21]	0.834
PIF × LEL	-5.039	[1.46]	0.148	2.192	[0.37]	0.709
IE × LEL	1.819	[1.04]	0.303	-2.426	[0.28]	0.779
SSE × LEL	8.687	[2.87]	0.005 **	-6.970	[0.23]	0.821
_cons	6.063	[3.25]	0.002 **	-3.458	[0.18]	
Number of obs		127			127	
R-squared		0.201			0.216	
Adj R-squared		0.045			-0.010	

Note 1: \*\*\*, \*\*, \* denote 1%, 5%, 10%.

Note 2: Estimation 1 used risk-sharing degree based on gross overall consumption data.

Estimation 2 used risk-sharing degree on staple food consumption data.

and community has weakened. With that, there is the possibility of replacing the conventional system with a comprehensive public safety net such as the 'new rural construction project' based on government interventions. Contrarily, this result confirms that central fiscal allocation reached the terminal village collections after the tax sharing reform.

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