Rental and Land Rental Market

Agricultural Taxation Relief and Subsidization

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Motivation

- The Chinese government started a pilot policy in 2002 to cancel all agricultural taxes which has been in China for 2600 years.
- As an exogenous variable for farmer's behavior, this historical changing offered a natural experiment for the researchers.

Motivation

- The only way researchers and policy makers think out to guarantee the food security against the population growth and structural improvement of food consumption in China is to expand the scale of farm.
- Land rental market is useful because sale of rural land is still illegal in some developing countries, such as China.

Motivation

- The subsidy for unit acreage of grain will be $68.9/acre
- compared with unit subsidy of the US, $27/acre for wheat, $17/acre for soybean.
- Twice of American subsidy?
- Small-scale Vs Big-scale

Target

- What is the implication of Tax relief and Subsidy on land rental market?

Theory

- Extension of AHM Model

$$Max \quad U(C, l; F)$$

$$X_m = Y + w(L^o - L^h) + r(A^o - A^i) - p_K K$$

$$Y = p_a Q(A, K, L) + s$$

Theory

- Subsidy affected the behavior because that it make the marginal benefit from input increase.
- Difference or Innovation
  the input here is not only Labor

Theory

- Nonseparable AHM:
  The demand of the family survival and development
  Imperfect land property right
  Imperfect land rental market
  Substitutability between family labor and hired labor

Empirical Methodology

- **Step1: Estimating the production function**
  Cobb-Douglas Production Function
- **Step 2: Estimating the shadow wage and shadow rental nested with subsidy**

$$VMPL_j = p_j \partial Q_j / \partial L_j = p_j \lambda_{L_j} \hat{Q}_j / L_j$$

$$VMPA_j = p_j \partial Q_j / \partial A_j = p_j \lambda_{A_j} \hat{Q}_j / A_j$$

Empirical Methodology

$$w_w^* = \lambda_{L_w} (p_w \hat{Q}_w + s) / L_w$$

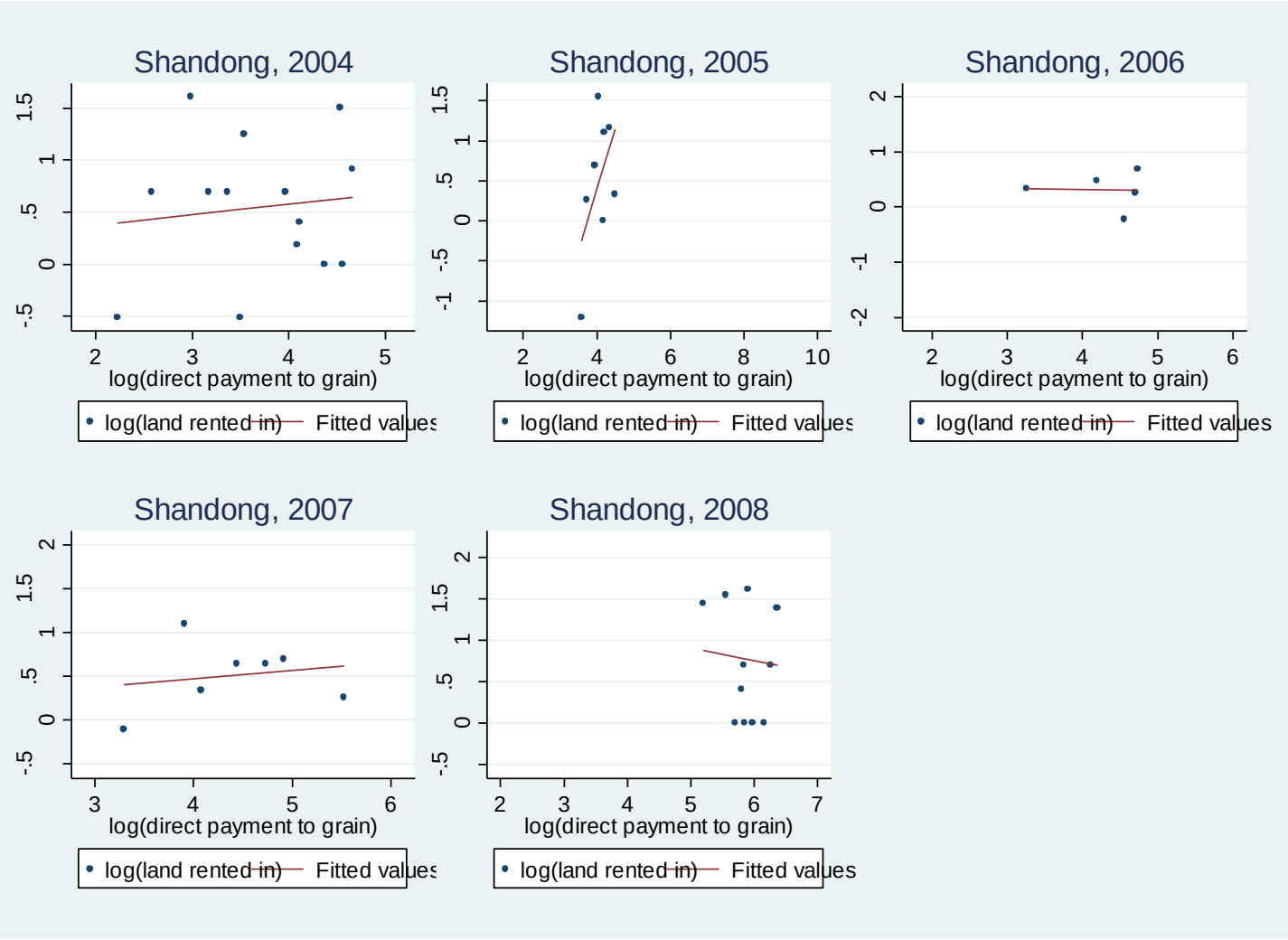
$$r_w^* = \lambda_{A_w} (p_w \hat{Q}_w + s) / A_w$$

- **Step 3: Generating supply function and derivate demand function of factors with nested subsidy**

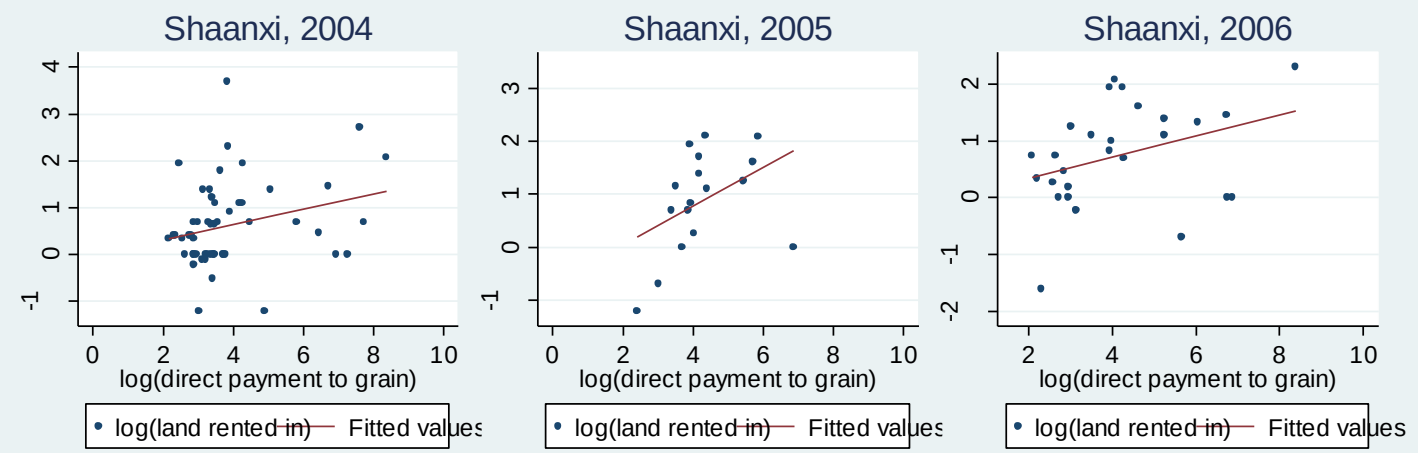
Data and Results

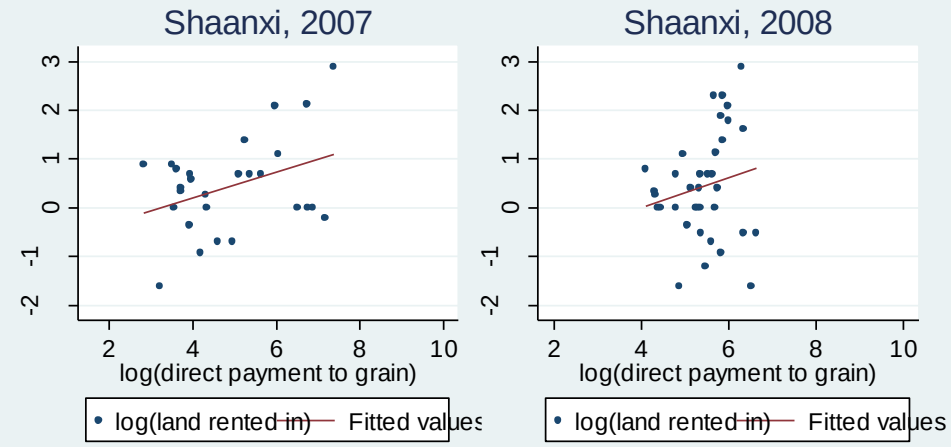
- Ministry of Agriculture's RCRE National Fixed Point Survey (NFPS).
- Panel dataset of Shandong and Shaaxi province which contains 1239 households constantly observed in 2 provinces from 2003 to 2008.
- 1046 households grew wheat consecutively and 1203 households grew corn consecutively.
- 297 rural households reported renting-in constantly and 616 reported renting-out constantly.

Incidence of Land Renting-in and Subsidy for Grain (Shandong)

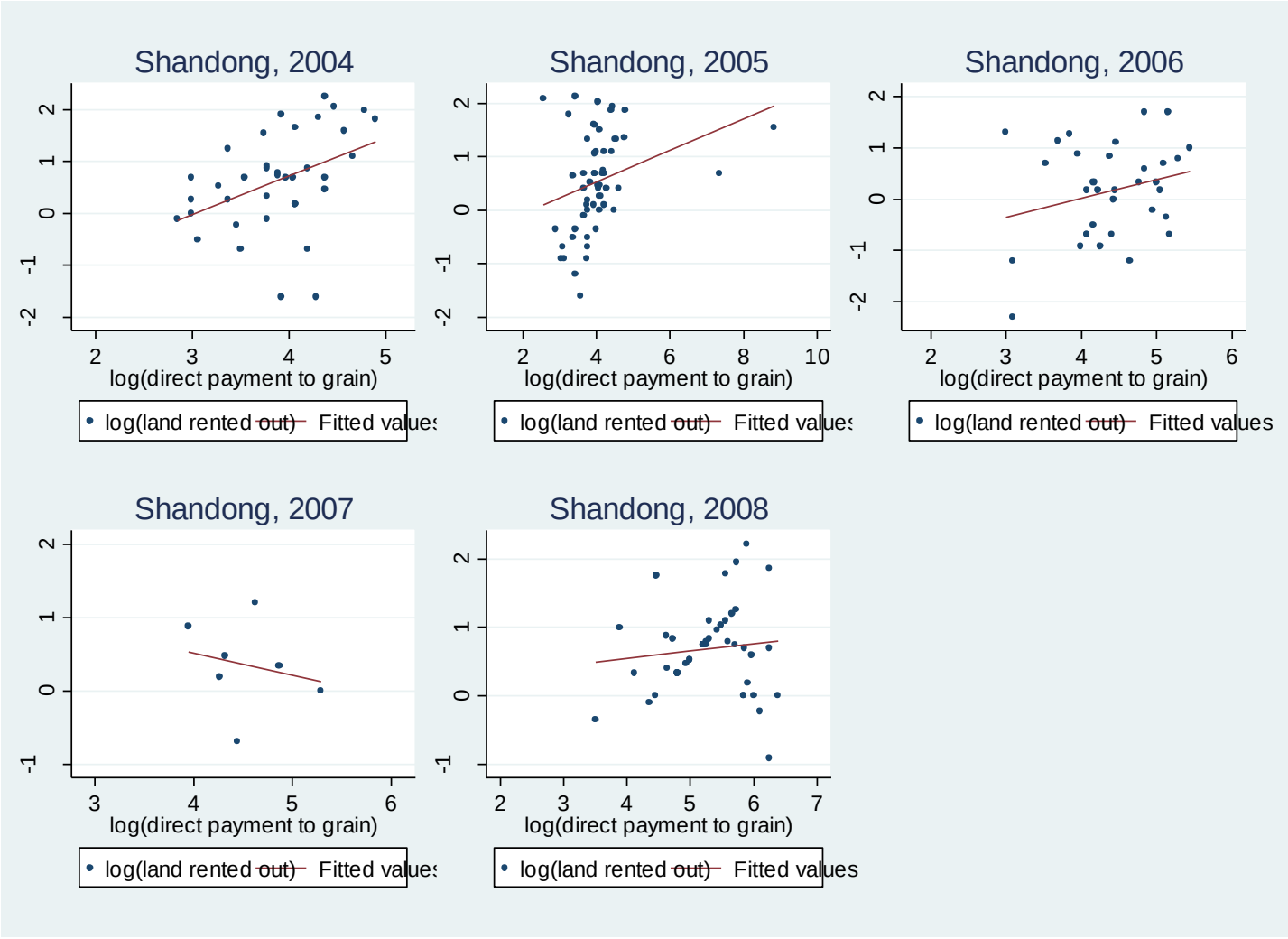


Incidence of Land Renting-in and Subsidy for Grain (Shaanxi)

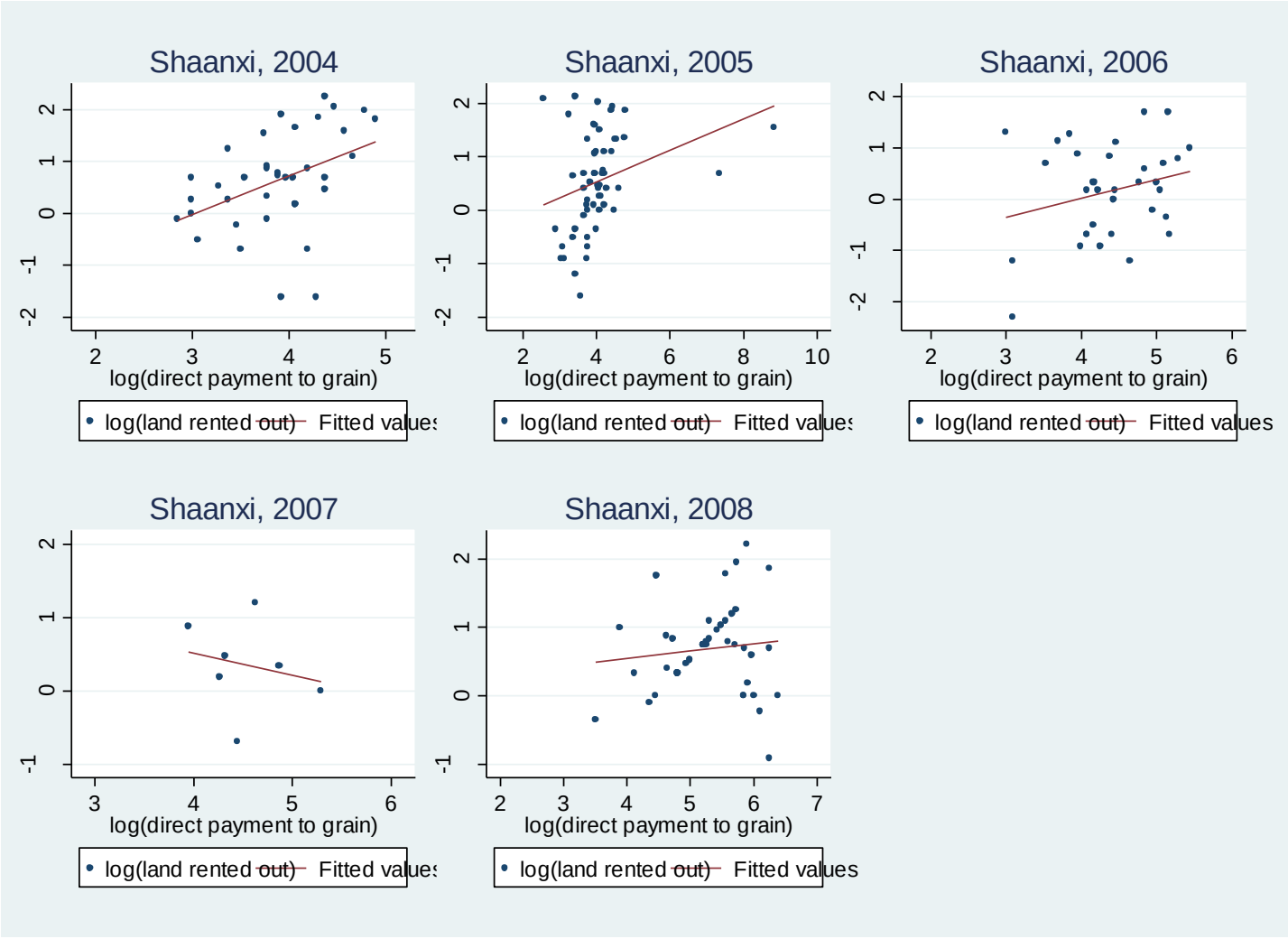




Land Renting-out and Subsidy for Grain (Shandong)



Land Renting-out and Subsidy for Grain (Shaanxi)



Step 1

Table 2 Estimation of grain production

	Wheat	Corn
Log(Acreage)	0.567277	0.562984
	(0.01732)	(0.013864)
Log(Capital)	0.175986	0.266219
	(0.011726)	(0.010601)
Log(Labor)	0.072076	0.062448
	(0.01192)	(0.006751)
_cons	4.891443	4.601889
	(0.069604)	(0.057022)
Overall R square	0.8147	0.8479

Standard Error is in the parenthesis.

Step 2

Table 3

	2003 mean/sd	2004 mean/sd	2005 mean/sd	2006 mean/sd	2007 mean/sd	2008 mean/sd
Shadow rental	295.59 (197.08)	342.44 (246.96)	338.46 (250.78)	334.45 (254.85)	360.48 (331.96)	426.62 (382.00)
Market rental	142.04 (155.36)	227.21 (282.15)	467.79 (593.43)	1079.79 (2908.38)	520.06 (655.14)	598.72 (1239.38)
Shadow wage	2.97 (1.74)	4.4 (2.70)	4.25 (3.81)	4.35 (3.91)	4.36 (2.85)	5.28 (5.32)
Market wage	15.14 (14.01)	18.08 (13.49)	24.34 (14.03)	27.68 (17.59)	33.58 (27.59)	40.4 (33.43)

Standard deviation is in the parenthesis.

Table 4

	Land Renal Market		Labor Market	
	Coefficients	Standard Error	Coefficients	Standard Error
Market	-0.00356	0.0357	0.0263	0.00870
Constant	285.2	20.92	2.764	0.144
F-test	789.4 (0.0000)		12519.5 (0.0000)	

p-value is in the parenthesis.

Step 3

Table 5 Effects of Shadow Wage and Shadow Rental on Explicit Demand for Rental Land (Land Renting in)

	Fixed-effects Regression	Random effect Tobit Regression
Shadow wage	0.174	-0.00849
nested with subsidy	(0.121)	(0.0559)
Shadow rental	-0.000263	-0.00352***
nested with subsisy	(0.00129)	(0.00113)
Agricultural taxes and	0.000108	-0.00267*
fees	(0.00137)	(0.00142)

Step 3

Household head's	0.00103	-0.0108**
age	(0.00241)	(0.00492)
Household head's	-0.365	0.770*
age square	(1.125)	(0.407)
Household head's	0.0311	-0.0358
schooling	(0.0844)	(0.0289)
Household head's	1.123*	-1.141**
schooling square	(0.625)	(0.514)
Household head's	-0.0132*	0.0107**
spouse's age	(0.00702)	(0.00544)
Household head's	0.154	-0.839**
spouse's age square	(0.843)	(0.330)
Household head's	-0.00740	0.0536*
spouse's schooling	(0.0751)	(0.0285)
Household head's	-0.0227	0.0657
spouse's schooling square	(0.112)	(0.0697)
Land area allocted		3.271***
		(0.582)
Shaanxi		1.202**
		(0.494)
_cons	-22.27	-3.995
	(14.54)	(4.775)
sigma_u		2.851***
_cons		(0.409)
sigma_e		3.183***
_cons		(0.230)
Overall R^2	0.0003	
Log likelihood		-966.50363

Step 3

Table 6 Effects of Shadow Wage and Shadow Rental on Explicit Supply for Rental Land (Land Renting out)

	Fixed-effects Regression	Random effect Tobit Regression
Shadow wage	0.113***	0.0534***
nested with subsidy	(0.0319)	(0.0201)
Shadow rental	-0.00117**	-0.00214***
nested with subsidy	(0.000471)	(0.000308)
Agricultural taxes and	0.000710	-0.000491
fees	(0.000440)	(0.000373)

Step 3

Household head's		0.0440
age		(0.0354)
Household head's	-0.00000131	-0.000312
age square	(0.0000836)	(0.000227)
Household head's	-0.223	-0.0186
schooling	(0.440)	(0.104)
Household head's	0.0253	0.00512
schooling square	(0.0313)	(0.00730)
Household head's	-0.0759	-0.0406
spouse's age	(0.107)	(0.0502)
Household head's	0.00146	0.000643
spouse's age square	(0.00137)	(0.000505)
Household head's	0.0282	0.103***
spouse's schooling	(0.675)	(0.0297)
Household head's	0.00116	-0.000298***
spouse's schooling square	(0.0456)	(0.0000828)
Land area allocted	0.447***	0.380***
	(0.0432)	(0.0181)
Shaanxi	0	0.186
	(.)	(0.169)
_cons	-0.236	-1.473
	(5.433)	(1.304)
sigma_u		1.170***
_cons		(0.100)
sigma_e		1.764***
_cons		(0.0620)
Overall R^2	0.0343	
Log likelihood		-2088.2163

Conclusion

- Labor benefit push land factor to the rental market
- Land benefit attracts farmers rent out less.