

# **The Returns to Education in Formal and Informal Sector**

**Albert Park**

**Department of Economics, University of Oxford**

**Xiaobo QU**

**Institute of Population and Labor Economics, CASS**

# **Presentation goals and outline**

**Presentation goal: to provide preliminary empirical evidence and demonstrate features of returns to education in formal and informal sector in urban china.**

**Outline :**

- **Background review**
- **Data, definition and method**
- **To discuss returns to education in formal and informal sector**
- **Preliminary conclusion**

## Background review

Informal sector employment is an interactive result of competitive market forces and labor market segmentation in urban China.

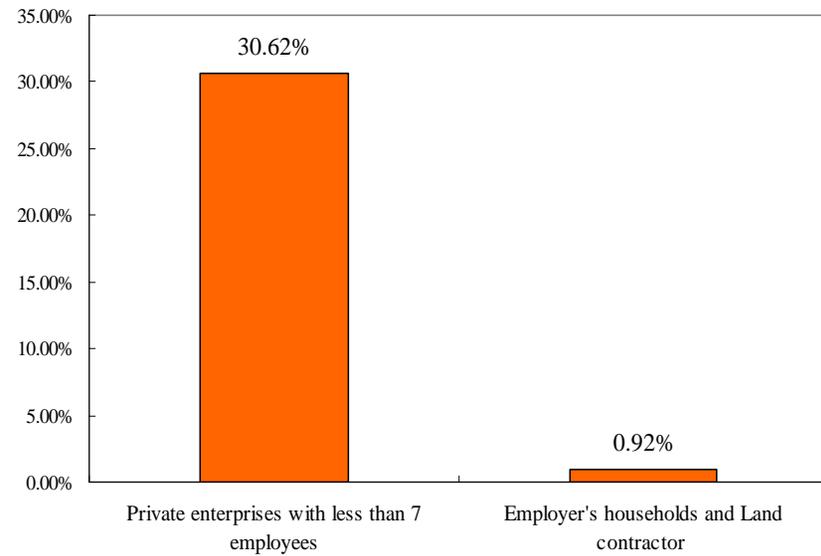
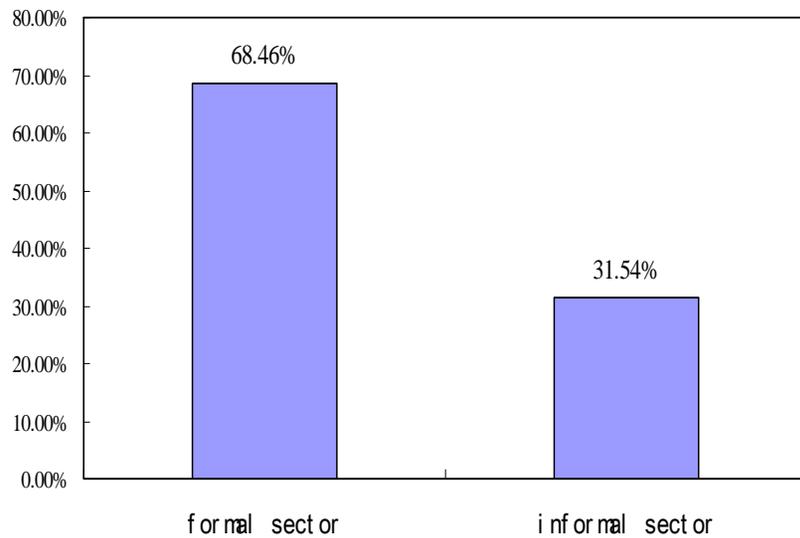
- Earnings to education of informal sector shows a heterogeneous structure (*Isabel Günther, 2011, JDE*).
- Some developing countries experience urbanization that accompanies skill upgrading, the expansion of the formal sector, the shrinkage of the informal sector (*Kazuhiro Yuki, 2007, JDE*).
- There exists an education premium for high skilled workers in the informal sector (*Marcelo Arbex, 2010, Insper Working Paper*).

- Studies on the returns to education for China mainly focuses on urban residents, rural residents, local workers in urban and migrant workers....
- But What about the returns to education in formal and informal sector, there is no detailed research yet. So my study aims to give a preliminary introduction.
- It is point out that terms like formal/informal sector, or formal/ informal job position , or formal/informal employment, these are all defined and identified from different levels and perspectives, my report only focus on returns to education of formal and informal sector in urban China.

# Data, definition and method

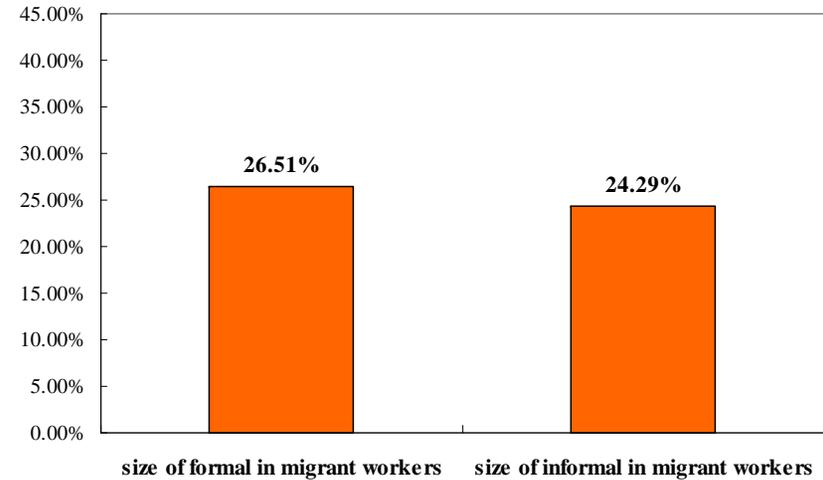
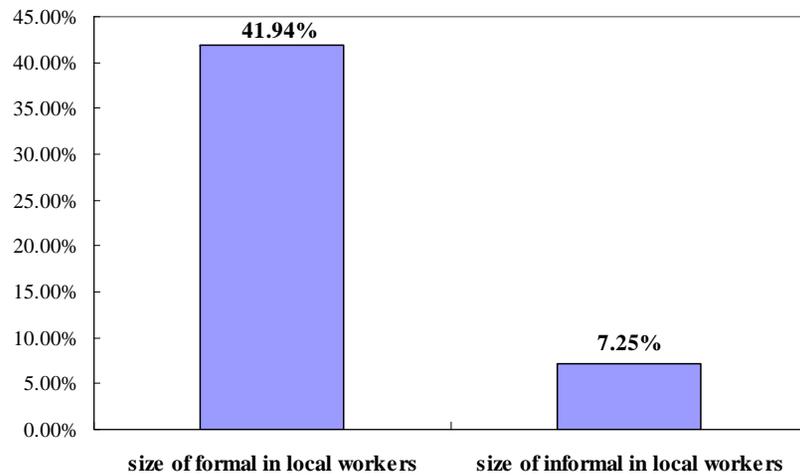
- Data from third round China Urban Labor Survey(CULS3)
- Definition of Informal sector is Private enterprises with less than 7 employees, Employer's households, Land contractor and others.
- Identifying standards for formal and informal sector according to classification proposed by professor Wu Yaowu.
- Method: statistical analysis, estimating wage equation

# Employment size in informal sector



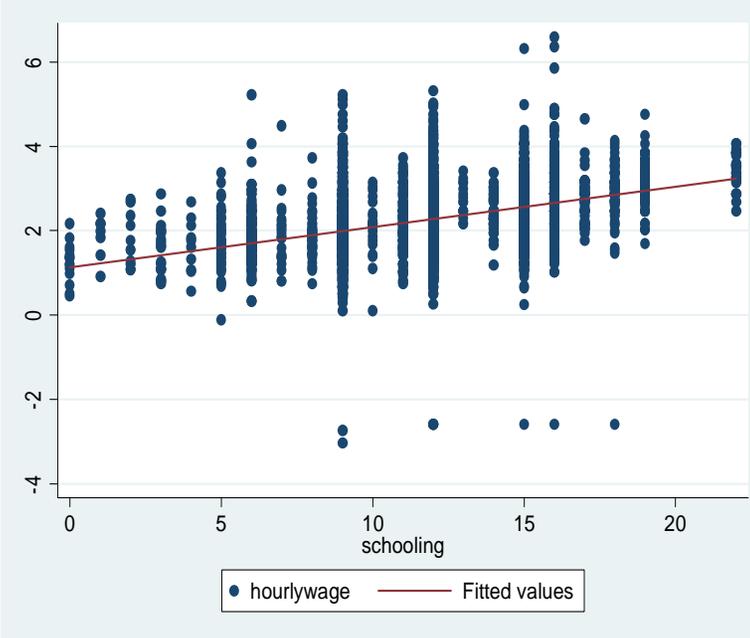
Source: CULS3

Migrant workers account for principal proportion in Informal sector compare to local workers.

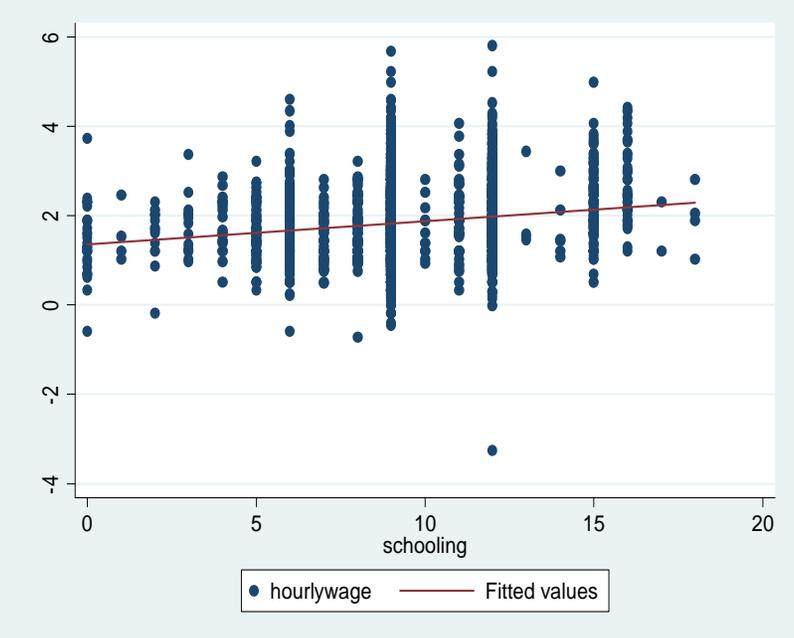


Source: CULS3

the line of fitted value in informal sector tend more horizontal than formal sector, the slop of fitted value line in formal sector is evident bigger than informal sector.

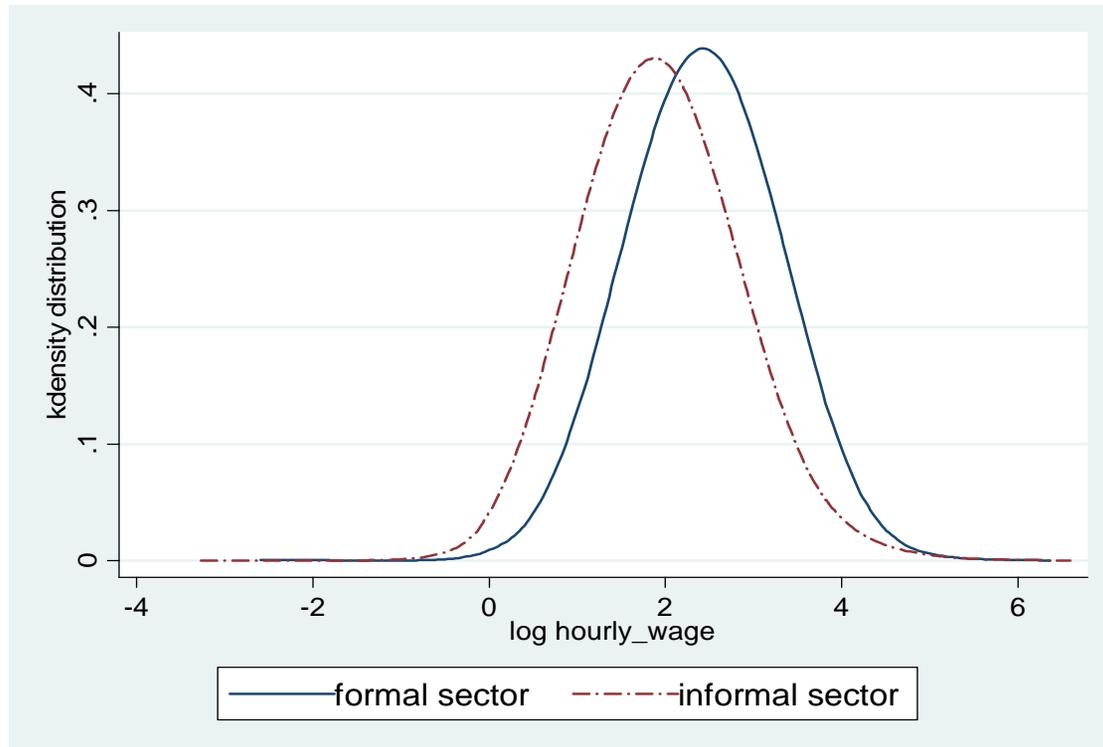


Log Hourly wage plot in formal sector



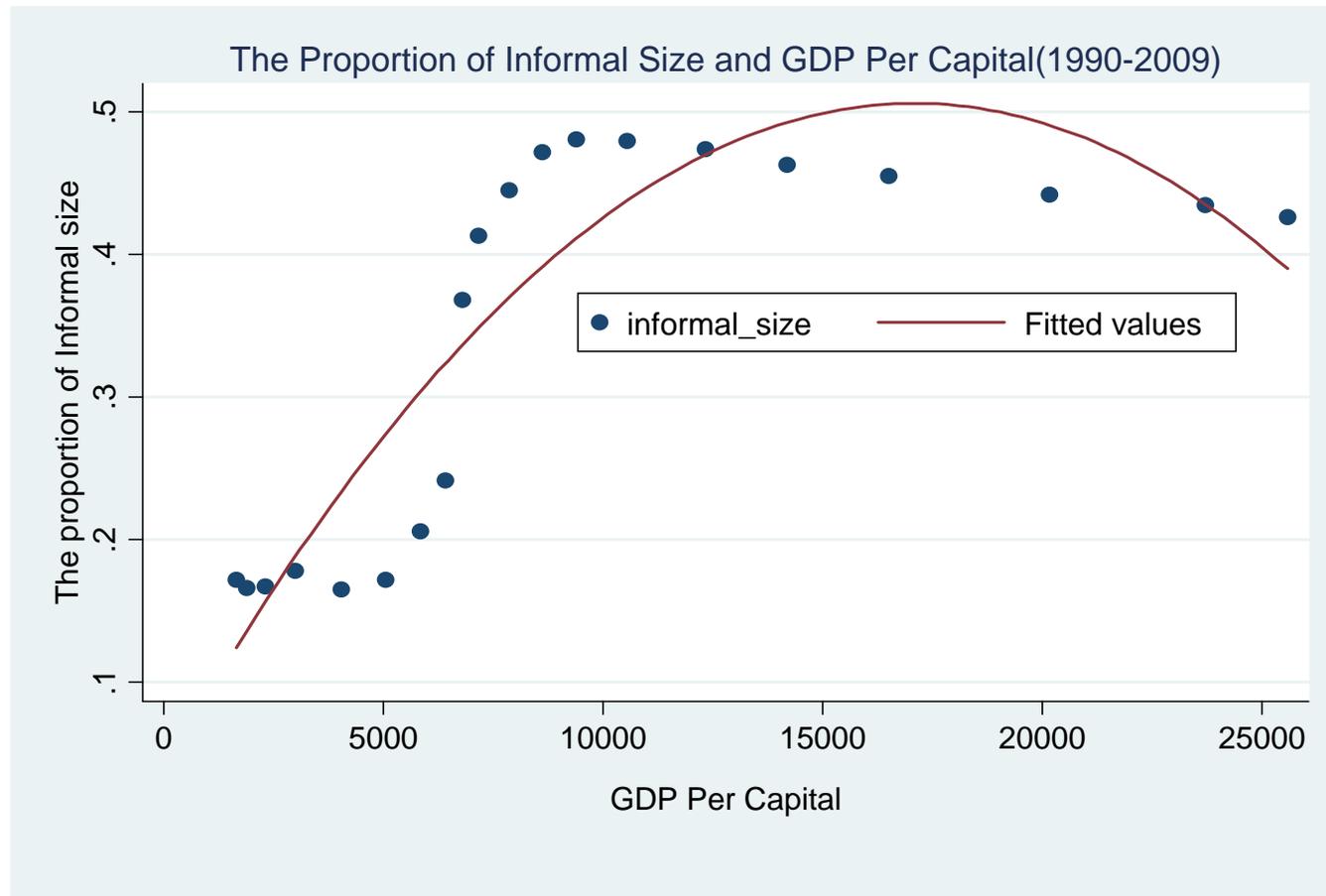
Log Hourly wage plot in informal sector

The density of log-monthly wages in the formal and informal sector overlap to large extent.



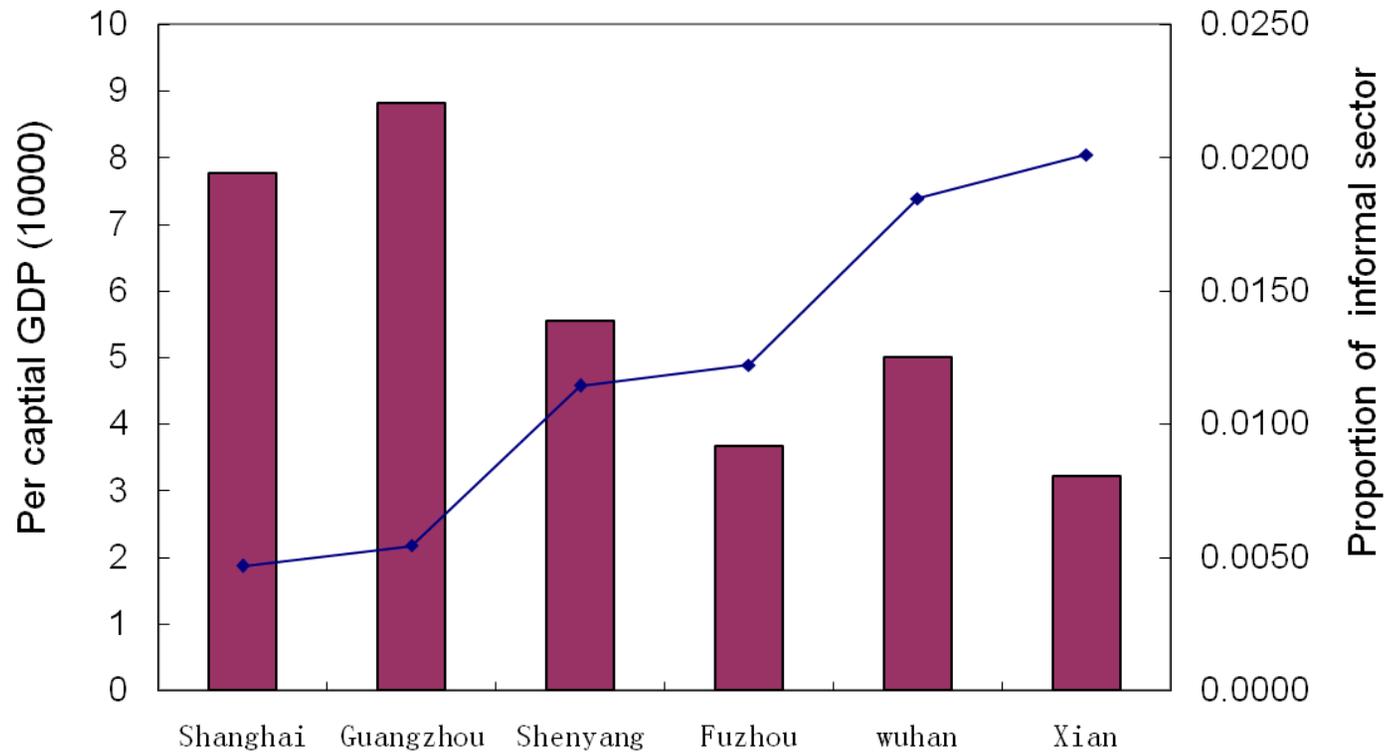
Source: CULS3

NBS annual data shows share of informal sector size declining trend with GDP per capital.



Source: "China Statistical Yearbook", NBS(2010)

The CULS3 shows share of informal sector in the city falling with GDP per capita.



Source: CULS3

There is a relationship between the size of informal sector in a city and returns to education for individuals.

Statistical results of human capital and individual characteristics for Women Aged 16 to 55 and Men aged 16 to 60.

	Sector		Employment		Pooled
	Formal	Informal	Formal	Informal	
<b>Age</b>	38.2	38.6	39.4	35.6	38.5
<b>Sex (male=1)</b>	57.4	53.8	58.7%	52.2%	51.3%
<b>Spoused (yes=1)</b>	78.9%	87.7%	80.9%	79.6%	76.0%
<b>Schooling years</b>	12.7	10.2	13.0	10.6	11.9
<b>Middle school and below</b>	22.8%	55.8%	19.3%	50.8%	32.4%
<b>Regular high school</b>	27.1%	27.1%	27.9%	25.2%	29.5%
<b>Vocational high school</b>	10.2%	7.5%	10.3%	8.5%	9.11%
<b>Vocational higher education</b>	21.0%	6.6%	22.0%	10.1%	15.9%
<b>Regular College and above</b>	18.9%	3.0%	20.6%	5.5%	13.0%
<b>Work experience</b>	19.4	22.1	20.4	18.7	22.0
<b>Monthly wage</b>	2622.9	2658.3	2654.8	2569.6	2424.0
<b>Weekly working hours</b>	46.4	65.7	44.2	60.1	47.3
<b>Hourly wage (Yuan)</b>	14.3%	11.1	14.4	9.5	11.9
<b>Obs</b>	7570	3471	5278	5757	11,041

Note: Statistical results of all variables is weighted. Source: CULS3

## Estimating Results of Years of Education in formal and informal sector (I)

	Formal sector		Informal sector	
	OLS	Heckman	OLS	Heckman
<i>Wage function</i>				
Schooling years	0.1023***	0.103***	0.055***	0.056***
Experience	0.0183***	0.0183***	0.0222***	0.0236***
Experience_square	-0.0003***	-0.0003***	-0.0006***	-0.0007***
Intercept	0.929***	0.926***	1.356***	1.319***
<i>Select function</i>				
Schooling years		0.040***		0.013
Experience		0.0057*		0.0171
Experience_square		-0.0003		-0.0004
Children under 16 in the family		0.0111		0.038
Old people over 60 in the family		-0.117		-0.149
Intercept		1.755***		1.805***
athrho		.0880**		.8312***
lnsigma		-.5079***		-.2242***
Obs	7436		3409	

Note: Dependant is log-hourly wages. “\*\*\*, \*\*, \*” significant at 1%, 5%, 10%. Estimating is weighted, and sample restrict age 16 to 60.

## Estimating Results of Returns to Education in formal and informal sector (II)

	Formal sector		Informal sector	
	OLS	Heckman	OLS	Heckman
<i>Wage function</i>				
Schooling years	0.105***	0.106***	0.068***	0.067***
Experience	0.027***	0.027***	0.0224***	0.0231**
Experience_square	-0.0005***	-0.0005***	-0.0006***	-0.0006***
Sex (male=1)	0.205***	0.205***	0.252***	0.248***
Wuhan (Shanghai=0)	-0.391***	-.0396***	-0.680***	-0.646***
Shenyang (Shanghai=0)	-0.547***	-0.548***	-0.511***	-0.512***
Fuzhou (Shanghai=0)	-0.256***	-0.257***	-0.222***	-0.229***
Xi'an (Shanghai=0)	-0.636***	-0.636***	-0.532***	-0.489***
Guangzhou (Shanghai=0)	0.0212	0.021	0.220***	0.261***
Intercept	0.917***	0.916***	1.289***	1.334***
<i>Select function</i>				
Sex (male=1)		0.008		0.254**
Schooling years		0.039**		-0.073
Experience		-0.0056		0.015
Experience_square		0.0003		-0.0005
Children under 16 in the family		0.013		0.042
Old people over 60 in the family		-0.124		-0.124
City dummy		Yes		Yes
Intercept		1.893***		1.640***
Obs	7434		3409	

Note: Dependant is log-hourly wages. “\*\*\*, \*\*, \*” significant at 1%, 5%, 10%. Estimating is weighted, and sample restrict age 16 to 60.

## Estimating Results of Returns to Education in formal and informal sector (III)

	Formal sector		Informal sector	
	OLS	Heckman	OLS	Heckman
<i>Wage function</i>				
Regular high school	0.221***	0.221***	0.202***	0.204***
Vocational high school	0.310***	0.311***	0.207***	0.192***
Vocational higher education	0.595***	0.596***	0.443***	0.428***
Regular College and above	0.901***	0.901***	0.802***	0.802***
Experience	0.032***	0.032***	0.027***	0.027***
Experience_square	-0.0006***	-0.0006***	-0.0007***	-0.0007***
Sex (male=1)	0.207***	0.207***	0.268***	0.275***
City dummy	Yes	Yes	Yes	Yes
Intercept	1.835***	1.836***	1.807***	1.768***
<i>Select function</i>				
Sex (male=1)		0.008		0.233
Regular high school		-0.024		0.062
Vocational high school		0.270		-0.485**
Vocational higher education		0.209		-0.285
Regular College and above		0.383**		0.055
Experience		0.0005		-0.008
Experience_square		0.0002		-0.0003
Children under 16 in the family		0.012		0.043
Old people over 60 in the family		-0.121		-0.120
City dummy		Yes		Yes
Intercept		2.240***		1.816***
Obs		7434		3409

Note: Dependant is log-hourly wages. “\*\*\*, \*\*, \*” significant at 1%, 5%,10%. Estimating is weighted, and sample restrict age 16 to 60.

### Estimating Results of Returns to Education controlled city variables by OLS

	Coefficients	Std. Err
Schooling	0.1527***	0.062
Experience	0.0251***	0.003
Experience2	-0.0005***	0.000
Sex	0.2174***	0.015
city_infshare	-3.9441***	0.823
gdp_per capital	0.0806***	0.018
gdp_rate	-8.8827*	5.305
gov_pay per capital	0.0000**	0.000
Educ*city_infshare	0.2801***	0.064
Educ* gdp_per capital	-0.0003	0.001
Educ* gdp_rate	-0.7050*	0.427
Educ* gov_pay per capital	0.0000	0.000
_cons	2.3655***	0.765
Obs	10844	

Note: "\*\*\*\*, \*\*, \*" significant at 1%, 5%, and 10%. Dependent variable is log-hourly wage.

## Estimating Results of **Switching Regression Model** for Formal and Informal Workers

Variable	Coefficients	Std. Err
<hr/>		
Log hourlywage (infemp=1)		
Schooling	0.0444***	0.008
experience	0.0299***	0.003
experience2	-0.0008***	0.000
Sex ( male=1)	0.2335***	0.017
Wuhan (shanghai=0)	-0.5766***	0.029
Shenyang (shanghai=0)	-0.4649***	0.030
Fuzhou (shanghai=0)	-0.2082***	0.031
Xian (shanghai=0)	-0.6163***	0.031
Guangzhou (shanghai=0)	0.1550***	0.031
_cons	1.4224***	0.080
<hr/>		
Log hourlywage (infemp=0)		
Schooling	0.1122***	0.008
experience	0.0214***	0.003
experience2	-0.0005***	0.000
Sex ( male=1)	0.2147***	0.016
Wuhan (shanghai=0)	-0.4601***	0.026
Shenyang (shanghai=0)	-0.5403***	0.028
Fuzhou (shanghai=0)	-0.2863***	0.027
Xian (shanghai=0)	-0.5993***	0.030
Guangzhou (shanghai=0)	0.0091	0.026
_cons	0.9056***	0.151
<hr/>		

---

infemp (selection equation)		
Schooling	-0.2991***	0.006
experience	-0.0356***	0.005
experience2	-0.0003**	0.000
Sex (male=1)	0.0021	0.028
Wuhan (shanghai=0)	0.1048**	0.046
Shenyang (shanghai=0)	0.0780	0.050
Fuzhou (shanghai=0)	0.0239	0.049
Xian (shanghai=0)	0.4328***	0.049
Guangzhou (shanghai=0)	-0.1497***	0.048
Formal_othern (identifying variable)	-0.4176***	0.031
_cons	4.5396***	0.105
/lns1	-0.4724***	0.013
/lns2	-0.5860***	0.010
/r1	0.2160**	0.091
/r2	-0.2636*	0.083
Obs		10843

---

Note: “\*\*\*, \*\*, \*” significant at 1%, 5%, 10%. Sample is women Aged 16 to 55 and Men aged 16 to 60. Definition of formal and informal employment is just based on social insurance in this table.

## Preliminary conclusion

- In terms of hourly wage, returns to education of formal sector is obviously higher than informal sector, after control dummy variable such as individual features and city, returns to education of informal sector is about less than 4% formal sector.
- With the rise of education level, returns to education in both formal and informal sector tend to increase. In addition, returns to vocational high school are higher than that of regular high school. But at similar educational level, earnings of informal sector is still below than formal sector.
- Share of informal sector in cities falls with the rise of GDP per capita and it also interact with individual earnings of education.

- Earnings of informal sector in urban China share similar features with some other developing countries, for example

Thanks!