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# The Impact of E-Commerce on China's Rural Poverty

2022 CAS Undergraduate Research  
Conference

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# E-Commerce and Poverty

- China's poverty decreased from 17.2% to 0.6% from 2010 to 2019, contributing to 70% of the poverty reduction globally.
- China's E-Commerce contributes to 38% of China's GDP in 2020 and more than half of the world's E-Commerce retail sales in 2021.

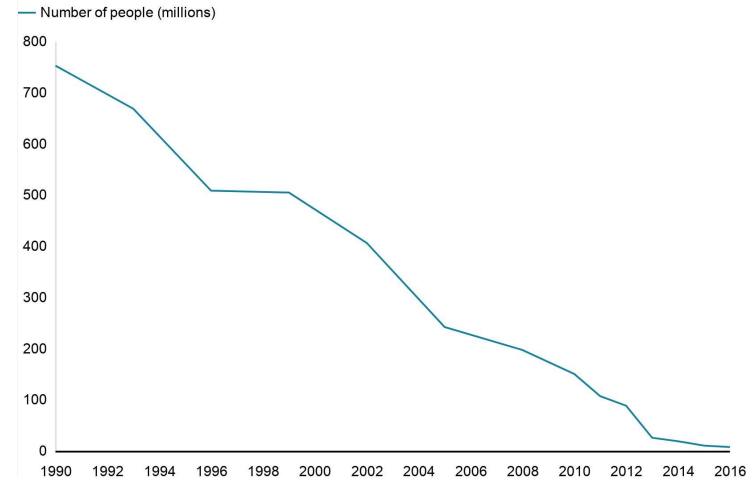
How does having E-Commerce villages at county level affect regional poverty in China?

## China's Taobao Villages

- The number of active online stores reaches more than 10% of local households, and the annual E-Commerce transaction volume reaches more than 10 million RMB.
- Taobao villages accounted for 50% of China's rural online retail sales with annual trading volume exceeded 1 trillion RMB in 2020.

### How extreme poverty fell in China

Living on less than \$1.90 a day



Source: World Bank

BBC

# Literature Review

## Theoretical Approach and Case Studies

- The Ali Annual Research Report(2009-2020) on China Taobao Villages demonstrates that as E-Commerce villages increase, there is an increase in online E-Commerce sales and rural job opportunities.

## Cause and Formation of Taobao Villages

- Jiaqi Qi [2019] and Min Liu [2020] found education, local industrial base and neighborhood effects to be crucial factors for the cause and formation of Taobao villages.

My research analyzes the actual impact of adopting E-commerce on poverty in China using a causal inference method with datas from a large sample of counties in different provinces.

# Hypothesis

- **Hypothesis 1:** Having E-Commerce villages at county level has a negative causal effect on regional poverty in China.
- **Hypothesis 2:** Poorer counties have more poverty reduction than richer counties after having Taobao villages.

Combine production, procession and sales  
Form specialized industry chains

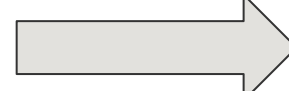
E-Commerce



Opens up larger sales market  
Creates new sales channels

Rural Industrialization

Larger employment opportunities



Increasing revenues  
Higher profits

Poverty Reduction

# Measurement and Datas

**Unit of Analysis:** County

**Treatment Variables:** % of Taobao villages at county level

- Taobao village yearly entrance ( *Ali Annual Research Report on China Taobao Villages (2014, 2016, 2021)* )
- Complete provinces and counties list ( *China's National Administration Statistics* )

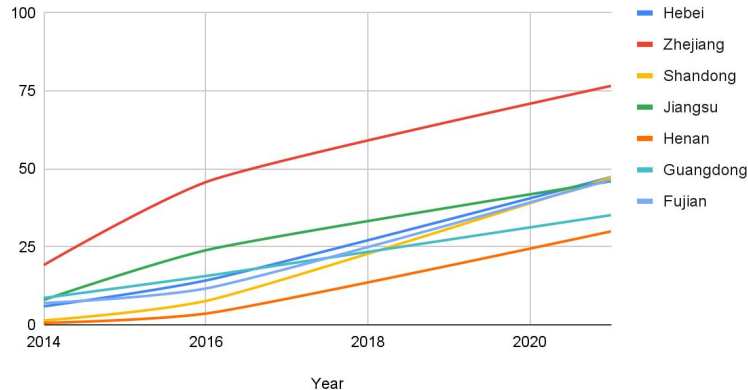
**Outcome Variables:** Per capita GDP at county level/ Share of secondary industry at county level

- ( *National Bureau of Statistics (2014, 2016, 2021)* )

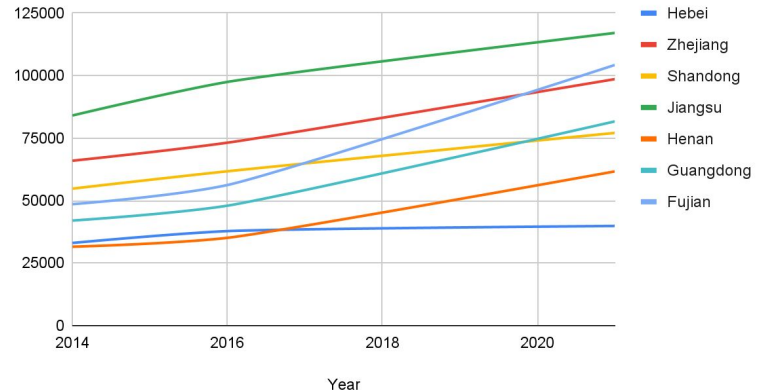
**Confounders:** Location, Industry Type, Education, Infrastructure

- ( *China County Statistical Yearbook (2014, 2016, 2021)* )

% of Counties with at least 1 Taobao Village by Year



GDP Per Capita (RMB) by Year



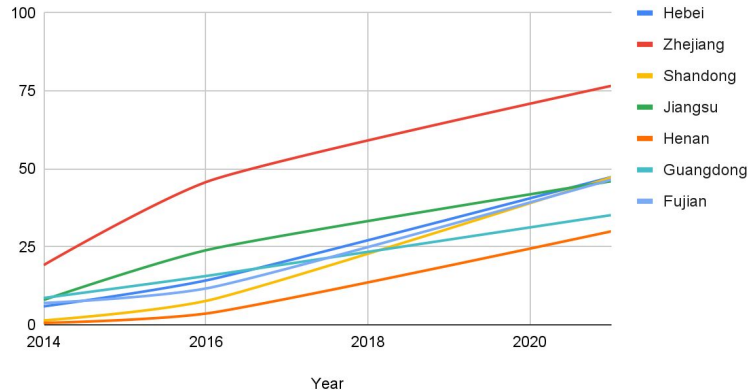
# Measurement and Datas

## Unit of Analysis: County

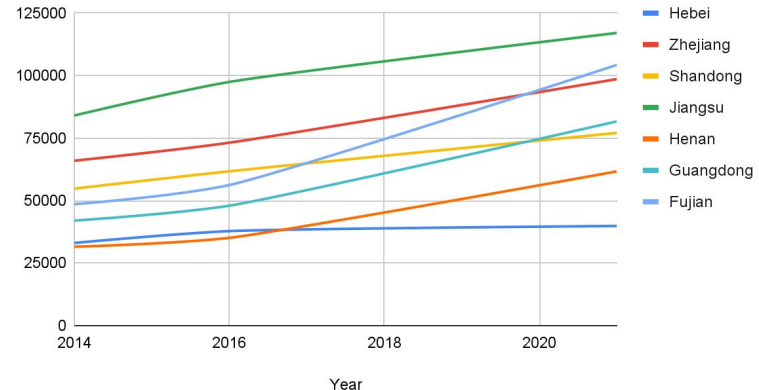
As the % of counties with at least 1 Taobao villages in each of the seven provinces increase, the average GDP per-capita (RMB) of counties in seven provinces also increases from 2014 to 2021.

- (China County Statistical Yearbook (2014, 2016, 2021))

% of Counties with at least 1 Taobao Village by Year



GDP Per Capita (RMB) by Year



# Statistics

Summary Statistics for % of Taobao villages at county level in 2021

**27** Provinces , **2591** Counties

Treated Counties	Control Counties	NA	Min %	Max %	Mean %	Median %
564	1982	45	0	100	0.83	0

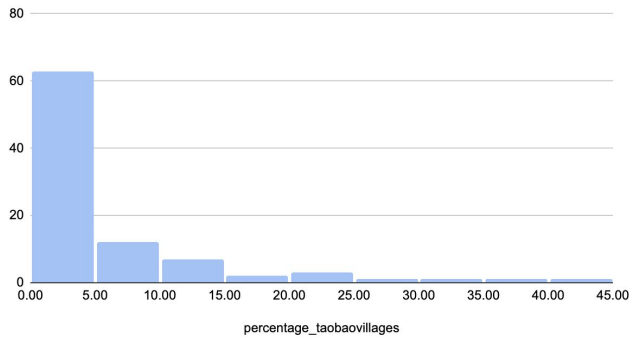
Province	Total counties	Treated counties	Control counties	NA	Min %	Max %	Mean %	Median %
Hebei	169	80	89	0	0	19.75683891	1.522662494	0
Zhejiang	94	72	19	3	0	44.49339207	5.721767732	2.53164557
Shandong	144	68	71	5	0	100	1.704899619	0
Jiangsu	113	52	57	4	0	32.25	2.072695333	0
Henan	167	50	112	5	0	11.53846154	0.5447152026	0
Guangdong	128	45	78	5	0	41.29353234	4.061649611	0
Fujian	86	40	43	3	0	76.19047619	3.901016709	0



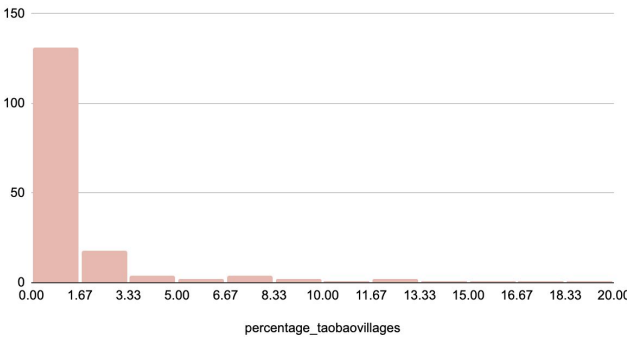
## Zhejiang

- **44** treated counties has Taobao villages fall into the range from 1% to 5%, the maximum reaches **44.49%**
- Most counties have per-capita GDP fall into the range from **50,000** RMB to **100,000** RMB, the maximum reaches **400,000** RMB

Counties % Taobao villages in Zhejiang Province 2021



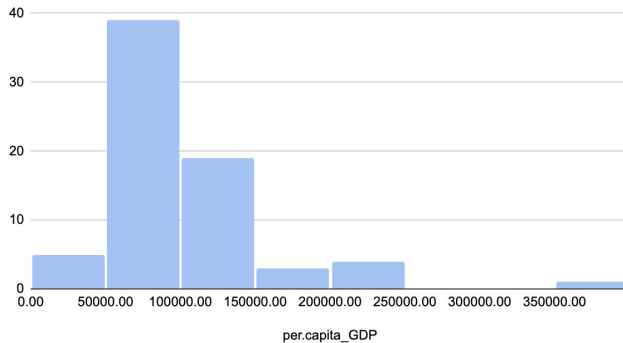
Counties % Taobao villages in Hebei Province 2021



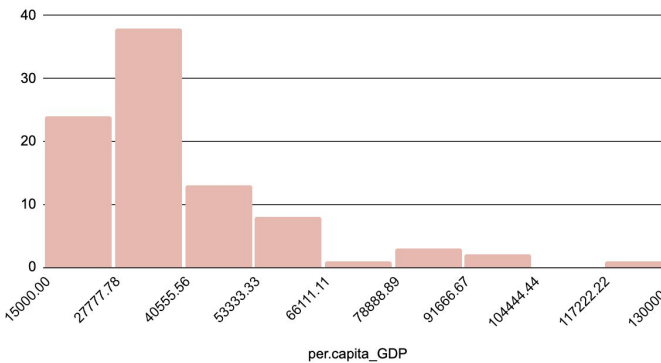
## Hebei

- **64** treated counties has Taobao villages fall into the range from 1% to 5%, the maximum reaches **19.76%**
- Most counties has per-capita GDP fall into the range from **30,000** RMB to **40,000** RMB, the maximum reaches **130,000** RMB

Counties Per Capita GDP in Zhejiang Province 2021



Counties Per Capita GDP in Hebei Province 2021





# Two-Way Fixed Effect Panel Data Regression

$$Y_{ct} = \alpha + \beta_1 Taobao_{ct} + \beta_2 P_{ct} + \gamma_c + \gamma_t + e$$

Analyzes the effect of Taobao villages on county level per-capita GDP or the share of secondary industry in GDP controlling county and year fixed effect and population.

## Advantages of Two-Way Fixed Effect:

Control unobserved time invariant county specific variables.

### Two Samples of Times:

- 2014, 2021
- 2014, 2016, 2021

- Analyze the change of poverty over time in counties with Taobao villages compared to counties without Taobao villages.
- Analyze the change of poverty over time in relatively poorer counties with Taobao villages compared to relatively richer counties with Taobao villages.

### Two Samples of Counties:

- Relatively Richer Counties: Observations with GDP per-capita above the medium GDP per capita in 2014.
- Relatively Poorer Counties: Observations with GDP per-capita below the medium GDP per capita in 2014.

Table 5: Effect of Taobao villages on GDP per-capita and % second industry using samples in 2014, 2016 and 2021

	(1)	(2)	(3)	(4)	(5)	(6)
	GDP	Log GDP	GDP	Log GDP	% 2nd	% 2nd
	per-capita	per-capita	per-capita	per-capita	Industry	Industry
% Taobao Villages	-859.28	-0.01	-368.88	-0.002	0.08	-0.23
	(533.49)	(0.01)	(380.46)	(0.005)	(0.09)	(0.37)
Population			-0.03*			
			(0.02)			
Log (Population)				-0.67***		12.30
				(0.26)		(12.68)
Observations	1949	1949	1945	1945	1741	1741

- A 1% increase in Taobao village corresponds to a **decrease of 859.28 RMB** in GDP per capita. It is substantially **small**.
- All of the p values > 0.1. The results are not statistically significant. As a result, we fail to reject the null hypothesis that the effect is 0.
- **% of Taobao villages have little or NO effect on per capita GDP and share of secondary industry.**

**What Might Explain this Effect ?**

Table 10: Effect of Taobao villages on GDP per-capita and % second industry using samples of relatively richer counties in 2014 and 2021

	(1)	(2)	(3)	(4)	(5)	(6)
	GDP	Log GDP	GDP	Log GDP	% 2nd	% 2nd
	per-capita	per-capita	per-capita	per-capita	Industry	Industry
% Taobao Villages	-1645.74***	-0.02***	-888.71	-0.01	0.12	0.24
	(540.99)	(0.004)	(1022.92)	(0.01)	(0.11)	(0.22)
Population			-0.03			
			(0.04)			
Log (Population)				-0.28		-5.55
				(0.30)		(8.00)

- A 1% increase in Taobao villages in **relatively poorer counties** corresponds to an increase of 33.56 RMB in county level GDP per capita.
- A 1% increase in Taobao villages in **relatively richer counties** corresponds to a decrease of 1645.74 RMB in GDP per capita.

**Taobao villages may be particularly advantageous to poorer counties.**

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**Negative effects are dominated by the relatively wealthier counties.**

**Benefits on the poorer counties from Taobao villages are offset by the harms that Taobao villages bring to the richer counties.**

**A pretty big increase in Taobao villages in poorer counties will create a meaningful increase in GDP per capita/ decrease in poverty.**

# Why E-Commerce is particularly advantageous to poorer counties?

- **Poorer counties have more room for economic growth than richer counties**
  - Higher potential for increase in margin of profit and employment opportunities.
  - Less local business competitions, making new businesses easier to survive and succeed in the online market.
- **Poorer counties have comparative advantages in online Taobao production**
  - Produce the same goods or services for a much lower opportunity cost.
  - Winning more market share and greater profitability.

## Policy Suggestions

**The government should implement policies to encourage the development of E-Commerce in poor regions**

- R&D investment, online business trainings, financial subsidies and other economic assistance.

### *Insufficiencies & Limitations:*

1. **Limitation of measurement**
  - GDP-per capita at village level
  - Number of active Taobao online stores at village level
  - Annual E-Commerce transaction volume at village level
2. **Lack of available samples of datas**
  - GDP per-capita in 2014 and 2016
3. **Potential selection bias**
  - Many Taobao villages are located in poor places that have low GDP per capita in the first place
  - Lack of data for control on education levels and infrastructure levels on county level

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# Thank You !



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