

Letting Old Data Speak: Local Cultural Traits in Qing China Grain Prices

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Motivation

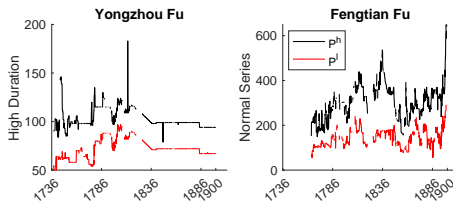
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Motivation

- Principal-agent problem arises from the delegation of authority and misalignment of incentives
- To align interest, principal needs to know the preference of agents
- Cultural norms are powerful determinants of the severity of principal-agent problem
- Ignoring cultural information creates limits an optimal contract to align interest

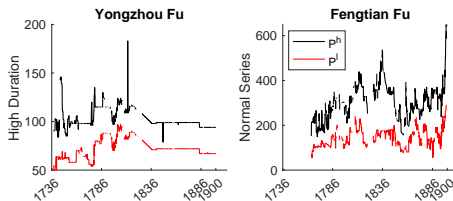
What have we done?

- Focus: Data reporting from peripheral to central government
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 - Detect for prolonged zero price change



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- OLS and IV to study the correlation between Qing and modern data quality
- Study the conditions under which cultural persistence was higher

What have we learned?

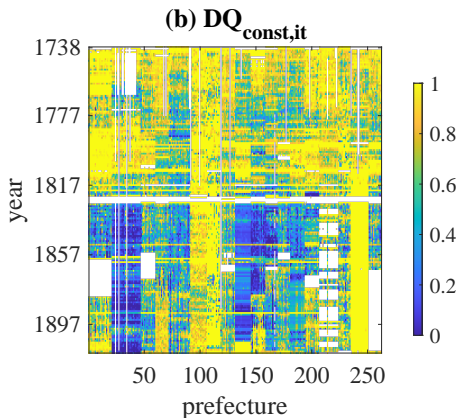
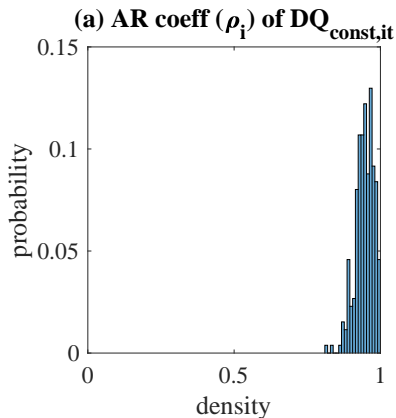
- QGPD data quality:
 - large variation across prefectures
 - time persistence was high
- Poor Qing data quality correlated with data misreporting in PRC
 - 1 sd increase in data quality in Qing reduce severity of data manipulation by 0.38 sd
- Culture amplifies incentive of data misreporting in affluent places

- Qing Dynasty Grain Price Database:
 - Collected each month, multiple times in multiple locations within prefecture, report highest and lowest prices ($P_{i,j,m}^h$ and $P_{i,j,m}^l$)
 - Each report, grain price checklist (*liangjia dan*), compiled in provincial level for each prefecture is submitted to central government
 - 174 years from 1736-1911, 339 prefectures, 42 grain types

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 - Each report, grain price checklist (*liangjia dan*), compiled in provincial level for each prefecture is submitted to central government
 - 174 years from 1736-1911, 339 prefectures, 42 grain types
- Local clerks carried out the task
- They have power to recommend and select their successors

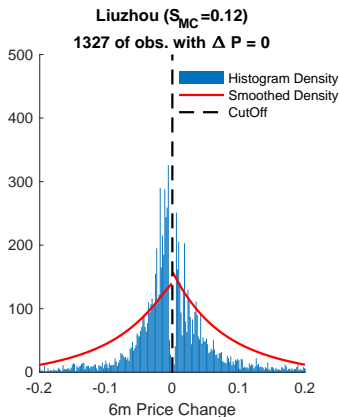
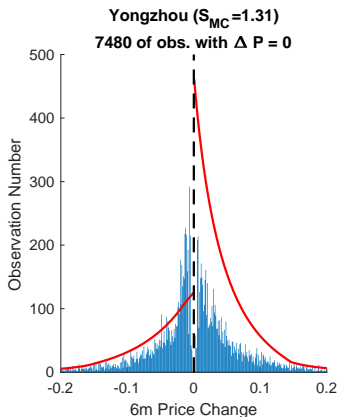
Behavior of Manipulation

- Seasonality: $DQ_{const,it}$ which is $\Delta P = 0$ for 6 months
- High persistence and gap in Daoguang period



Detecting Grain Price Manipulation

- We pick up places with constant price for a period of 6 months
- Use McCrary (2008) test to detect discontinuity on density



- Define $DQ_{MC,i} = -1 \times |S_{MC,i}|$

Relationship with Modern Data Manipulation (DM)

- Empirical Strategy:

$$DM_i = \alpha_0 + \alpha_1 DQ_{MC,i} + \alpha \mathbf{X}_i + \epsilon_i$$

- Instrumental Variable Approach

- 1 Inverse of distance to provincial capital ($Dist_i^{-1}$)
- 2 Province fixed effect (δ_p)

- IV Strategy:

$$DQ_{MC,i} = \beta_0 + \beta_1 Dist_i^{-1} + \beta_2 \delta_p + \beta \mathbf{X}_i + \epsilon_i$$

and

$$DM_i = \gamma_0 + \gamma_1 \widehat{DQ}_{MC,i} + \gamma \mathbf{X}_i + \epsilon_i$$

Modern Data Manipulation (DM)

- GDP misreporting using DMSP-OLS Nighttime Lights Time Series
- GDP bunching using realized GDP growth almost exactly match target GDP growth
- Severity of Great Famine and Production Exaggeration

	DQ_{MC}	GDP Light	GDP Bunching	Famine Severity
DQ_{MC}	1			
GDP Light	-0.185***	1		
GDP Bunching	-0.072	0.069	1	
Famine Severity	-0.165***	0.080	0.059	1

Main Result

Dependent Variables:	GDP Light		GDP Bunching		Famine Severity		First Principal Component	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: OLS								
DQ_{MC}	-0.187** (0.075)	-0.185** (0.070)	-0.098* (0.047)	-0.094** (0.044)	-0.184*** (0.053)	-0.223*** (0.056)	-0.278*** (0.068)	-0.325*** (0.065)
Panel B: 2SLS								
\widehat{DQ}_{MC}		-0.341*** (0.083)		-0.095* (0.052)		-0.179*** (0.051)		-0.382*** (0.056)
Control	N	Y	N	Y	N	Y	N	Y
N	269	269	270	270	240	240	238	238

Confucius Value and Data Quality

- Individuals exemplified because of good conduct, mentioned in local gazetteers. Proxy for popularity of a particular kind of Confucius Teaching.

	Confucius Value							
	Sage (Xian)		Loyalty (Zhong)		Filial Piety (Xiao)		Chaste Women (Lienü)	
DQ_{MC}	0.486*** (0.092)	0.464*** (0.105)	0.328*** (0.085)	0.351*** (0.084)	0.177 (0.153)	0.154 (0.170)	0.020 (0.021)	0.016 (0.020)
Provincial FE	Y	Y	Y	Y	Y	Y	Y	Y
Control	N	Y	N	Y	N	Y	N	Y
N	261	261	261	261	261	261	259	259
R-squared	0.82	0.82	0.81	0.82	0.81	0.82	0.81	0.81

Transmission of Culture

$$DM_i = \gamma_0 + \gamma_1 \widehat{DQ}_{MC,i} + \gamma \mathbf{X}_i + \epsilon_i$$

	GDP Light (1)	GDP Bunching (2)	Famine Severity (3)	First Principal Component (4)
<u>Panel A: Baseline</u>	-0.341*** (0.083)	-0.095* (0.052)	-0.179*** (0.051)	-0.382*** (0.056)
N	269	270	240	238
<u>Panel B: Treaty Port</u>	-0.389*** (0.201)	-0.287** (0.130)	-0.264** (0.125)	-0.535*** (0.109)
N	50	50	42	42
<u>Panel C: Coastal</u>	-0.808*** (0.305)	-0.231 (0.330)	-0.146 (0.148)	-0.612** (0.308)
N	36	36	31	31
Controls	Y	Y	Y	Y

Conclusion

- QGPD data quality varies across prefectures and persistent across time
- 1 sd \uparrow in Qing data quality \downarrow data manipulation by 0.38 sd
- Culture amplifies benefit of data misreporting