

China: State Capacity; The Demographic System

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- 1 Introduction
- 2 The Ming-Qing Economy: 1368-1840
- 3 The Turbulent Century: 1840-1949
- 4 The People's Republic: 1949-present

Introduction: What I will cover

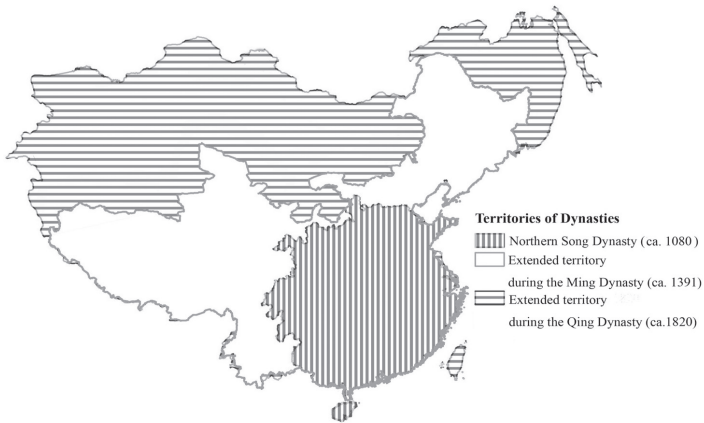


FIGURE 1
TERRITORIES OF THE NORTHERN SONG, MING AND QING DYNASTIES

- In this lecture, I will discuss two themes that have received considerable attention in recent research on Chinese economic history:
 - *State capacity*: “the ability of a state to collect taxes, enforce law and order, and provide public goods” (Johnson & Koyama, 2017). This relates to broader themes of institutions and governance.
 - The *Demographic System*: More nebulously defined as patterns of fertility, mortality, and marriage, and their relationship to the economy. This relates to broader themes of human capital and gender.
- I will follow these two themes through three time periods, based on Brandt et al. (2014):
 - The Ming-Qing Economy: 1368-1840
 - The Turbulent Century: 1840-1949
 - The People's Republic: 1949-present
- For each period, I will give you a broader historical overview based on Brandt et al. (2014). Then I will (usually) outline a recent research paper on state capacity and one on the demographic system.
- The two papers for student activity are also selected to cover these two themes, as is one of the required readings. The other required reading is an overview of Chinese economic history.

Introduction: What I will not cover

- Bai and Wu (2018) "Political Movement and Trust Formation: Evidence from the Cultural Revolution" *Unpublished Working Paper Revise and Resubmit at the European Economic Review*
- Bai and Wu (2018) "Political Conflict and Development Dynamics: Economic Legacies of the Cultural Revolution" *Unpublished Working Paper*
- Brandt, L., & Rawski, T. G. (Eds.). (2008). *China's great economic transformation*. Cambridge University Press.
- Brautigam, D. (2009). *The dragon's gift: the real story of China in Africa*. Oxford University Press.
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- Li, H., Loyalka, P., Rozelle, S., & Wu, B. (2017). Human capital and China's future growth. *Journal of Economic Perspectives*, 31(1), 25-48.
- Li, H., Rosenzweig, M., & Zhang, J. (2010). Altruism, favoritism, and guilt in the allocation of family resources: Sophie's choice in Mao's mass send-down movement. *Journal of Political Economy*, 118(1), 1-38.
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- Lin, J. Y. (2011). *Demystifying the Chinese economy*. Cambridge University Press.
- Meng, X., Qian, N., & Yared, P. (2015). The institutional causes of China's great famine, 1959-1961. *The Review of Economic Studies*, 82(4), 1568-1611.
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- Song, Z., Storesletten, K., & Zilibotti, F. (2011). Growing like China. *American Economic Review*, 101(1), 196-233.
- Storesletten, K., & Zilibotti, F. (2014). China's great convergence and beyond. *Annual Review of Economics*, 6(1), 333-362.
- Xu, C. (2011). The fundamental institutions of China's reforms and development. *Journal of Economic Literature*, 49(4), 1076-1151.

- There is another undergraduate module in economic history: EC104, “The World Economy: History & Theory.”
- I do not wish to duplicate what is taught in that module, so I am explicitly avoiding sources that I discussed in lecture or assigned as readings within the past three years. I list them on the slide if you are interested.
- The exception is Brandt et al. (2014): I have used it as a recommended reading in EC104, it is excellent as an introductory text, and I don't think many of the students taking EC104 actually read it when it was assigned.

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Sources (including those from introduction)

- Brandt, L., Ma, D., & Rawski, T. G. (2014). From divergence to convergence: reevaluating the history behind China's economic boom. *Journal of Economic Literature*, 52(1), 45-123.
- Broadberry, S., Guan, H., & Li, D. D. (2018). China, Europe, and the great divergence: a study in historical national accounting, 980-1850. *The Journal of Economic History*, 78(4), 955-1000.
- Johnson, N. D., & Koyama, M. (2017). States and economic growth: Capacity and constraints. *Explorations in Economic History*, 64, 1-20.
- Lavelly, W., & Wong, R. B. (1998). Revising the Malthusian narrative: the comparative study of population dynamics in late imperial China. *The Journal of Asian Studies*, 57(3), 714-748.
- Lee, J. & Feng, W. (1999). *One quarter of humanity*. Harvard University Press.
- Lee, J. Z., & Campbell, C. D. (2007). *Fate and fortune in rural China: social organization and population behavior in Liaoning 1774-1873*. Cambridge University Press.
- Sng, T. H., & Moriguchi, C. (2014). Asia's little divergence: State capacity in China and Japan before 1850. *Journal of Economic Growth*, 19(4), 439-470.

Population, Agriculture, and Credit

C. Agricultural output and output per capita

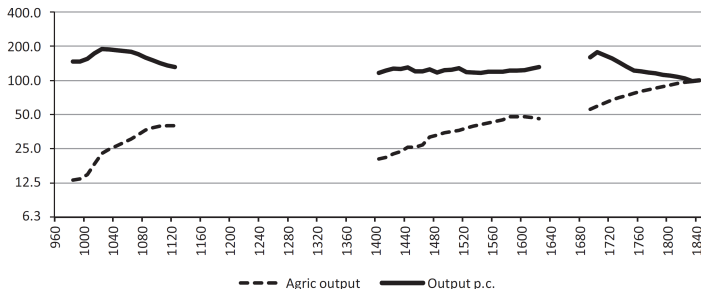


FIGURE 2
CHINESE POPULATION AND AGRICULTURE, 980–1840 (1840 = 100, LOG SCALE)

Source: Broadberry et al.

- Brandt et al.: 1400-1850, population grew from 70m to 400m; slower in times of political instability and famine. Output keeps up with population growth.
- Economy consists largely of family farms < 5 acres. 1400-1913, cultivated land tripled.
- Yields improve due to greater application of labor and fertilizer, not technical change.
- Rising specialized production in textiles, food processing, clothing, tobacco, paper, printing, tools, construction, and shipbuilding.
- Growing agricultural commercialization: markets as integrated in early 1700s as in Europe. Peasant farmers “diligent, ambitious, market-oriented” and responsive to price incentives.
- Formal financial system organized around *qianzhuang* (“native banks”) that issued loans, accepted deposits, and arranged remittances; money shops focused on currency exchange (e.g. copper and silver), and; pawnshops that lent on collateral.
- Informal credit came from shopkeepers, tradesmen, and individuals; farmers could monetize land use rights, though limited by high interest rates (e.g. 3pct monthly, no downward trend as in Europe) and transactions costs.

Urbanization and Trade

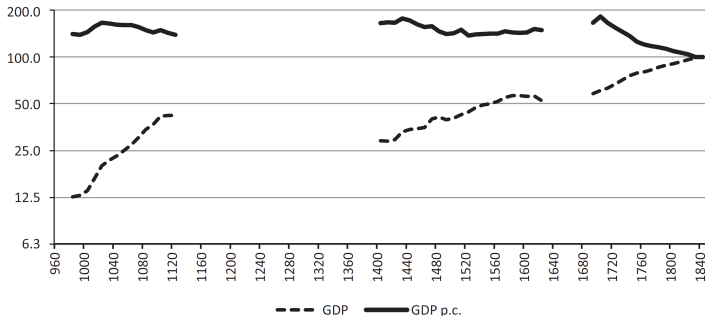


FIGURE 6
CHINESE CONSTANT PRICE GDP AND GDP PER CAPITA, 980–1840 (1840 = 100)

Source: Broadberry et al.

- Brandt et al.: Urbanization fluctuated between 3pct and 7pct: lower than in Europe. Market towns concentrated along rivers, creeks, and artificial canals.
- International trade was small ($< 1\%$ of GDP), and mostly within Asia: exports of porcelain, silk to SE Asia and tea to Central Asia, in return for imports of timber, spices, silver, copper, and horses.
- Silver imports were 0.2% of GDP, driven by the scarcity-driven high relative price of silver in China.
- Literacy in Qing China higher than in much of pre-industrial Europe.
- Brandt et al. verdict: "That the economy of Ming-Qing China ... delivered food, clothing and shelter to an immense and growing population despite growing demographic pressure and without widespread technological change surely merits recognition among the economic wonders of the premodern world."

Question & Method: Sng and Moriguchi

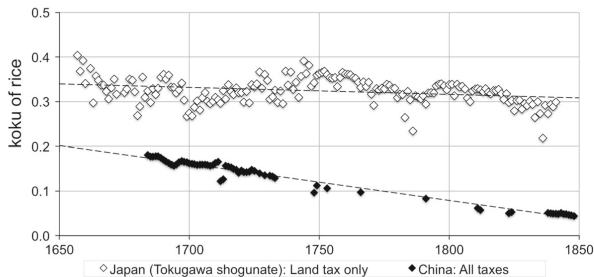


Fig. 1 Per Capita Tax Revenue in China and Japan. Sources: Shogunate's land tax from [Ohno \(1996\)](#); Japan's population estimates from [Hayami and Miyamoto \(1988\)](#); China's tax revenues from [Sng \(2014\)](#); China's population estimates from [Perkins \(1969\)](#)

Source: Sng and Moriguchi

- *Question:* Why did Qing China raise less revenue per capita and provide fewer public goods per capita than Tokugawa Japan?
- *Method:* Sng and Moriguchi use a principal-agent model. Key elements:
 - The ruler sets a tax rate τ on agricultural output Y , which is a function of population N . $Y(N)$ is increasing with diminishing returns. So: he seeks to maximize $\tau Y(N)$.
 - The local agent also adds an extralegal surcharge θ , so he can keep $\theta Y(N)$ for himself.
 - The ruler audits the agent. The probability of an audit, A , depends on the size of the country S . $A(S)$ is decreasing in S .
 - If the agent is audited, the probability his corruption is detected depends on θ . $D(\theta)$ is increasing in θ .
 - If he is detected, he faces a fine of X .
 - So: the agent chooses θ to maximize $\theta Y(N) - A(S)D(\theta)X$.
 - If extraction exceeds a rate peasants think is fair (i.e. if $\theta + \tau > r$) there is a rebellion. But the agent ignores this constraint.
 - So: the ruler knows the agent will choose θ in response to τ , and chooses τ subject to $\theta + \tau \leq r$.

Answer & Importance: Sng and Moriguchi

Table 1 Public goods provision in Qing China and Tokugawa Japan

	China	Japan
(a) Coinage	Copper only	Gold, Silver, Copper
Annual output of copper coins, aggregate	3,639,800 k (1756–65)	1,096,000 k (1764–88)
Annual output of copper coins, per capita	15 (1756–1765)	35 (1764–1788)
(b) Length of trunk roads (km)	11,370 (imperial routes)	1,440 (Gokaido)
Length per '00 sq. km	0.26	0.51 or 3.37
(c) Urban population (urbanization rate)	20.5 m (5.8 %)	5.1 m (16.5 %)
(d) Forest cover (million ha)	18.5 (1700) → 9.6 (1850) (Lingnan region only)	27 (1600) → 25.5 (1850)
(e) Grain stockpile per capita (husked rice, koku)	0.065 (1751) → 0.030 (1843)	0.038 (1751) → 0.046 (1843)

Source: Sng and Moriguchi

- *Answer:* The model predicts that:
 - In larger countries (S), corruption (θ) is greater.
 - In larger countries (S), taxation (τ) is lower.
 - Extending the model so that the ruler can invest in public goods that promote stability: In larger countries (S), fewer public goods are provided.
- Empirical evidence: Sng and Moriguchi provide evidence that corruption was greater, the tax rate lower, and there were fewer public goods provided in China before 1850.
- *Importance:* This helps explain why China was not the first Asian country to industrialize, even though many theories predict that a larger population speeds technological progress.
- Economic expansion can actually hurt the ruler by increasing agency problems when monitoring is costly.

The Chinese Demographic System



- An older view: China was Malthusian. Malthusian?
 - Mortality is decreasing in income (per capita) and fertility is increasing in income. This sets the equilibrium income.
 - Income is decreasing in total population. This sets the equilibrium population.
 - So: improvements in productivity lead to larger populations, not higher incomes.
- In this view, summarized by Lavelly and Wong:
 - Chinese population growth was governed by mortality (i.e. the “positive” check).
 - China had weak preventive checks (e.g. delayed marriage in bad times).
 - China was in a “high level equilibrium trap.”
- Lee and Feng: The Chinese demographic system differs from Malthus’ view, and has four characteristics:
 - ① Extensive female infanticide (Lee and Campbell (1997) estimate that one fifth to one quarter of girls were killed).
 - ② A gender-unbalanced marriage market.
 - ③ Low marital fertility.
 - ④ A late, rapid demographic transition.

Fertility, Marriage, and Mortality

Table 5.1 Female mean age at first marriage, China, selected populations

Period	Location	Mean age
1550-1850 ^a	Zhejiang	17.6/19.1
1640-1900	Beijing	20.7
1774-1840 ^b	Liaoning	18.3
1929-1931	Northern China	17.2
1929-1931	Southern China	18.7
1950-1954	China	17.5
1960-1964	China	19.1
1970	China	19.7
1982 ^c	China	22.4
1990 ^c	China	22.1
1995 ^c	China	22.6

- Lee and Feng: Mortality.
 - Collective and individual efforts to reduce mortality: granaries, *weisheng*, long breastfeeding, maternal nutrition, primitive smallpox inoculation: child mortality declined from $\sim 40\%$ in 1700 to $< 10\%$ in 1830.
 - Infanticide (especially of girls) was widespread: in Lower Yangtze, Middle Yangtze, and SE China, as many as 50% of newborns were killed. Reinforced by patrilineal/patrilocal/hypergamous family systems.
- Marriage
 - Female marriage was early (16-19 before 1960), and nearly universal ($< 4\%$ of women unmarried by 30) for women.
 - The counterpart is widespread male bachelorhood (10-15% still by age 30), which has declined over the 20th century.
- Fertility
 - Marital fertility was lower than in Europe, achieved through long breastfeeding and low coital frequency.
 - Polygynous fertility was low: polygyny substituted for divorce.

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Sources

- Brandt, L., Ma, D., & Rawski, T. G. (2014). From divergence to convergence: reevaluating the history behind China's economic boom. *Journal of Economic Literature*, 52(1), 45-123.
- Koyama, M., Moriguchi, C., & Sng, T. H. (2018). Geopolitics and Asia's Little Divergence: A Comparative Analysis of State Building in China and Japan after 1850. *Journal of Economic Behavior and Organization*, 155, 178-204.
- Shiue, C. H. (2017). Human capital and fertility in Chinese clans before modern growth. *Journal of Economic Growth*, 22(4), 351-396.

The late Qing economy: 1840-1911



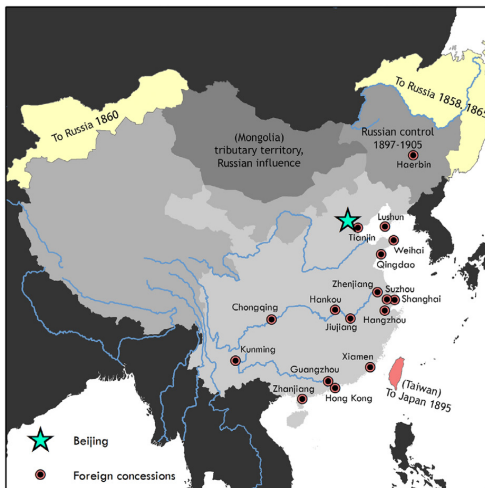
- Brandt et al.: Prior to 1800, China sold tea and silk to Europeans in return for silver from the Americas. Opium imports from India reverse the balance of trade. Britain responds to Chinese opium ban with war (1839-42). Treaty of Nanking cedes Hong Kong to the British, compels free trade, and initiates “treaty port” system.
- Treaty ports lead to a doubling of exports and 75% increase in imports, 1870-1895. New technologies introduced, but also resisted e.g. 1870s riots by traditional silk weavers in Guangdong.
- New institutions (modern banks, Shanghai stock exchange, limited liability smallholding companies, foreign-managed Imperial Maritime Customs...) also introduced through the treaty ports.
- Self-strengthening movement (1860-94): regional bureaucrats seek to increase China's military strength by developing Western-style, capital-intensive manufacturing with state funding.
- No reform of regime fundamentals (contrast Japan after 1868): no modern constitution or commercial law; no currency reform; railways prohibited and steamships limited to major rivers.

The republican economy 1912-1949



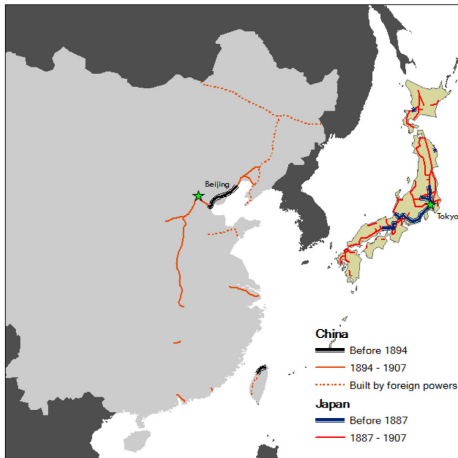
- 1895 military defeat to Japan + loss to multi-country expeditionary force during Boxer Rebellion \Rightarrow reforms, including establishment of Ministries of Commerce, Finance, Education, and abolition of the Confucian civil service exam.
- Ironically (see paper for student activity, Bai and Jia) these reforms help bring down the Qing.
- Despite political instability 1912-1927, major wave of industrialization. Output of modern industry grows $> 10\%$ per year 1912-36, clustered in lower Yangzi and Manchuria.
- Concentrated in textiles, food processing, and consumer goods.
- Dominated at first by foreign investors, but by 1933 73% of Chinese factory output came from Chinese-owned companies.
- Railway network expands from 364 km in 1894 to 21,000 in 1937.
- Money and Banking: minted silver dollars replace silver *tael*, spread of banknotes convertible to silver.

Question & Method: Koyama et al.



- *Question:* Both China and Japan came under threat from Western powers in the nineteenth century, but only Japan was successful in building a modern state in response. Why?
- *Method:* Koyama et al. use a model. Key elements:
 - A state chooses where to locate its base. Its territory is modeled as a one-dimensional line.
 - State capacity is modelled as collecting taxes in order to project military power.
 - A state projects military power from the base, but its military power is diminishing in distance from the base.
 - A state may face threats from one direction, or two (i.e. one or both sides of the line).
 - A decentralized state can have two bases; this can make dealing with two threats cheaper than trying to address them both from one base in the middle of the territory.
 - An authority can implement costly political reform that raises taxable income.

Answer & Importance: Koyama et al.



Railroad construction in Qing China and Meiji Japan

- *Answer:* The model gives several predictions:
 - If a one-sided threat is sufficiently strong, a centralized state locates its capital nearby in order to neutralize it.
 - If a centralized state faces serious threats from both sides, it locates its base in the middle in order to deal with both at once.
 - If a decentralized state faces serious threats from both sides, it locates its bases near each border in order to deal with both at once, each from a separate base.
 - So: with a serious one-sided threat, centralization is more resilient than decentralization. But with serious threats from both sides, political decentralization may be more resilient.
 - In a large and decentralized territory, investing in reform in response to two-sided threats may be too costly.
- *Importance:* This model helps explain:
 - Why China's capital was in the North when its main threat came from nomads in the North, even though most of the population was in the South.
 - Why China devolved authority to provincial administrators in the nineteenth century.
 - Why lack of state capacity at the local level made reform difficult.

Question & Method: Shiue

$$Education_i = \beta_0 + \beta_1 Brothers_i + X_i' \beta + \epsilon_i$$

- *Question*: Was there a child quantity-quality trade-off in imperial China?
- *Method*: Shiu gathers data from the Tongcheng genealogies. These cover on 43,000 adult men who lived in Anhui province between 1300 and 1900.
- Shiu codes a man as “educated” if he passed one or more levels of the official state examinations. This includes official students, *sheng-yuan* (minor civil officials), *juren* (those who passed the provincial examination), and *jinshi* (those who passed the highest exam).
- She runs Ordinary Least Squares and probit regressions.
 - The outcome variable for individual i , $Education_i$, is defined above.
 - The right-hand-side variable is $Brothers_i$: a man's number of brothers.
 - Quality-Quantity tradeoff: $\hat{\beta}_1 < 0$.
 - The controls (X) include (*inter alia*) a time trend, education of father and grandfather, ages at birth and death of the mother and father, birth order fixed effects, and lineage fixed effects.
 - Standard errors are clustered by household (i.e. father).
 - What about omitted variables bias? Control in X for plausible determinants of fertility. Show $\hat{\beta}_1$ is different in time periods when the returns to education are different.

Answer & Importance: Shiue

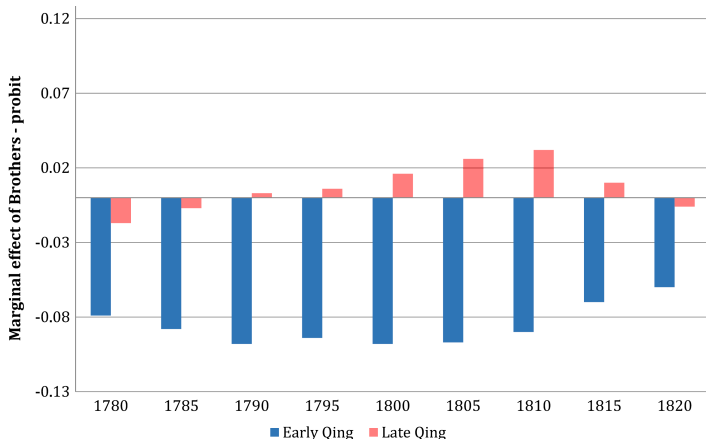


Fig. 3 Early versus late Qing quantity-quality relationship for alternative time breakpoints

- *Answer:* $\hat{\beta}_1 < 0$. In elite families in which both the father and grandfather was educated, an additional brother reduced a man's probability of education by 4 percentage points relative to a mean of 30%.
- *But:* this was only when the returns to education were high.
 - It was only under the first Qing emperor Shun-zhi (1644-1661) that non-examination routes into the civil service were reduced (e.g. personal recommendation, purchased degrees, purchased titles...). The quality-quantity tradeoff is not apparent earlier.
 - Population rose from 145m in 1700 to 425m in the late Qing period, while the number of high-ranking officials had remained ~ 1400 . This competition reduced the odds of success, and hence the return to investment in human capital. Further, wages of teachers (those who passed lower-level exams but failed higher-level exams) fell by the late Qing. The quality-quantity tradeoff disappeared in the 19th century.
- *Importance:* These results provide evidence:
 - That fertility control existed in pre-modern China, despite early and universal female marriage: families would have fewer sons to achieve educational investments.
 - That returns to education shaped fertility decisions.
 - That the quality-quantity tradeoff is not a modern phenomenon that requires "modern" western institutions.

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- Chen, T., & Kung, J. K. S. (2018). Busting the "Princelings": The campaign against corruption in China's primary land market. *The Quarterly Journal of Economics*, 134(1), 185-226.
- Qian, N. (2008). Missing women and the price of tea in China: The effect of sex-specific earnings on sex imbalance. *The Quarterly Journal of Economics*, 123(3), 1251-1285.

Socialist Planning: 1949-76

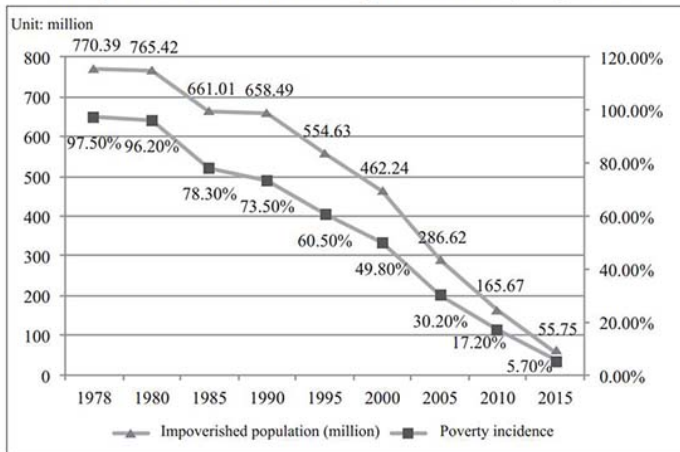


Source: www.posterazzi.com

- Brandt et al.: CCP create a vertical administrative structure that, for the first time, reaches the village.
- New government begins with orthodox fiscal and monetary policies in order to end hyperinflation and assist postwar recovery.
- Beginning in 1953, CCP implemented socialist planning based loosely on the Soviet model. Goal: create self-sustaining military industrial complex.
- Extraction through low prices paid to farmers and high prices charged to consumers; aided by collectivization, strict controls on mobility through the *hukou* system.
- Mixed outcomes: expansion of industry and technological capability, expansion of literacy, improved school attendance, maternal and infant survival, and life expectancy. GDPpc growth of 4%.
- But: assault on incentives for individuals and firms, persecution of intellectuals and educators, forced collectivization, unsuitable technology, and restricted flows of trade, people, and information.
- Per capita calorie availability falls below World Bank standards during Great Leap Famine, does not recover until 1980. Rural-urban gaps widen in living standards.

The Reform Era Since the Late 1970s

Poverty levels in China's rural areas according to the current rural poverty standard



- Brandt et al.: After the death of Mao, CCP objectives move towards economic growth and away from ideological correctness, persecution of descendants of landlords, businessmen, and noncommunist politicians. Elite recruitment came to include entrepreneurs.
- Officials evaluated in part on local GDP growth: leads to tournament-like competition and local experimentation.
- De-collectivization of agriculture. Household Responsibility System: households pay rent to local government, keep remaining profits; procurement prices raised, relaxed controls over rural markets.
- Other reforms to 1995: fiscal decentralization, establishment of Special Economic Zones and encouragement of foreign direct investment in labor-intensive export production.
- State enterprises enlivened through more autonomy for managers, loans from state banks, permitting firms to keep a share of their profits and sell output in excess of quotas.
- Further reforms since 1995: fiscal re-centralization; dismissal of millions of state employees, privatization, fiscal reorganization that reduced local officials' power to direct loans, reduced trade barriers and entry into the WTO, reduced state control of pricing, and increase in share of private business in output.

Question & Method: Chen and Kung

$$Price_{ickst} = \beta_0 + \beta_1 PrincelingPurchase_{ikjt} + \gamma X_i + T_{cst} + \nu_{ickst}$$

- *Question*: Do local officials charge less for land to firms connected to Politburo and Standing Committee members? Does this help them get promoted? Have Xi Jinping's anti-corruption efforts reduced this discount?
- *Method*: In a sample of over a million land sales from 2004-2016, Chen and Kung run a regression.
 - $Price_{ickst}$ is the log price in yuan per square meter for parcel i sold by municipal government c to firm k for usage s (e.g. commercial) in month-year t .
 - $PrincelingPurchase_{ikjt}$ is a dummy equal to 1 if the firm is connected to princeling j .
 - A "princeling" here is one of 134 offspring and extended family members of the Politburo and its Standing Committee.
 - A "connection" can include ownership or investment. There are 3,560 firms with at least one connection
 - X_i includes (*inter alia*) log area sold, land quality, firm size ...
 - T_{cst} includes fixed effects for city \times year \times usage, month, and industry.
 - Critically, Chen and Kung show results limiting their sample to sales within 500 metres of a "princeling" sale.

Answer & Importance: Chen and Kung

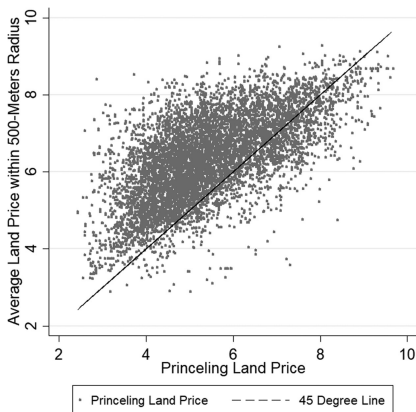


FIGURE IV
Land Prices within the 500-Meter Radius, Princeling and (Average)
Nonprinceling Prices Compared

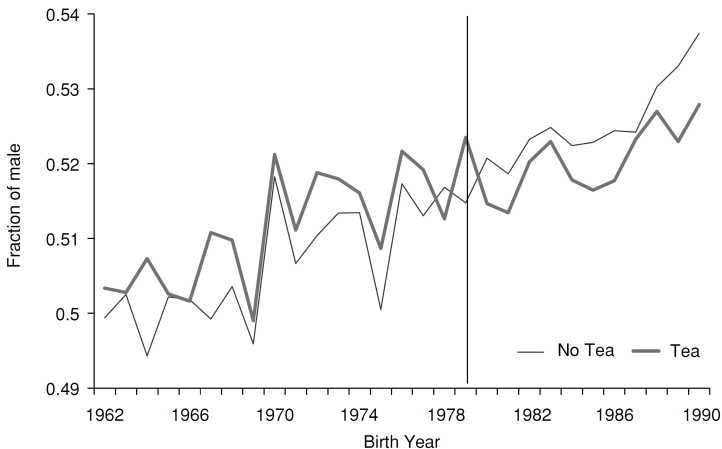
- *Answer:* Firms connected to princelings pay 57% less for land.
- Provincial party secretaries who give these discounts are 23% more likely to be promoted to national leadership positions.
- Three measures of Xi's anti-corruption efforts (transactions after 2012; central inspections; party secretaries appointed by Xi directly after 2012) all reduce the discount received by connected firms.
- Note: as a required reading, there are many more results in the paper that you should know but that I won't cover here.
- *Importance:* The results show that cronyism does not need to work through bribes.
- The nature of corruption in this case comes directly from the combination of decentralized control of state assets and personnel.
- The results demonstrate the importance of the design of institutions in tackling corruption.

Question & Method: Qian

$$\begin{aligned}sex_{ic} = & \beta Tea_i \times Post_c + \delta Orchard_i \times Post_c + \rho CashCrop_i \times Post_c \\ & + \zeta Han_{ic} + \alpha + \psi_i + \gamma_c + \epsilon_{ic}\end{aligned}$$

- *Question*: When the Household Responsibility System raised the returns to tea production, a crop in which women have comparative advantage, did this lead to greater survival of girls?
- *Method*: Qian runs a difference-in-difference regression:
 - sex_{ic} is the fraction of males in county i in birth cohort c .
 - Tea_i is the amount of tea planted in county i .
 - $Post_c$ is a dummy for individuals born after 1979.
 - $Orchard_i$ and $CashCrop_i$ are defined like Tea_i , and included so that we know the results are about female-specific crops, not commercialization in general. Boys have a comparative advantage in orchard production.
 - Han_{ic} is the fraction ethnically Han.
 - α is a constant; ψ_i and γ_c are county and cohort fixed effects.
 - Qian also instruments for $Tea_i \times Post_c$ with $Slope_i \times Post_c$: tea grows better on hills.

Answer & Importance: Qian



Source: Qian

- *Answer*: One additional *mu* of tea per household increased the fraction female in a cohort by 1.2 percentage points. Increasing the amount of tea planted also increased education of both boys and girls.
- Increasing orchard production decreases survival rates and educational attainment for girls.
- *Importance*: Prior studies of the effect of relative income on “missing women” struggled with problems of causal inference. Female income may be higher because women’s status is greater for unobserved reasons. The context allows Qian to rule out confounding effects of migration, technological change, or the ability to detect sex in utero.
- The results help us understand household decisions: it is difficult to explain the results using a “unitary” model in which parents view children as investments. Contrast this with the paper for student activity (Almond et al.).
- “The implication for policy makers is straightforward: factors that increase the economic value of women are also likely to increase the survival rates of girls and to increase education investment in all children.”