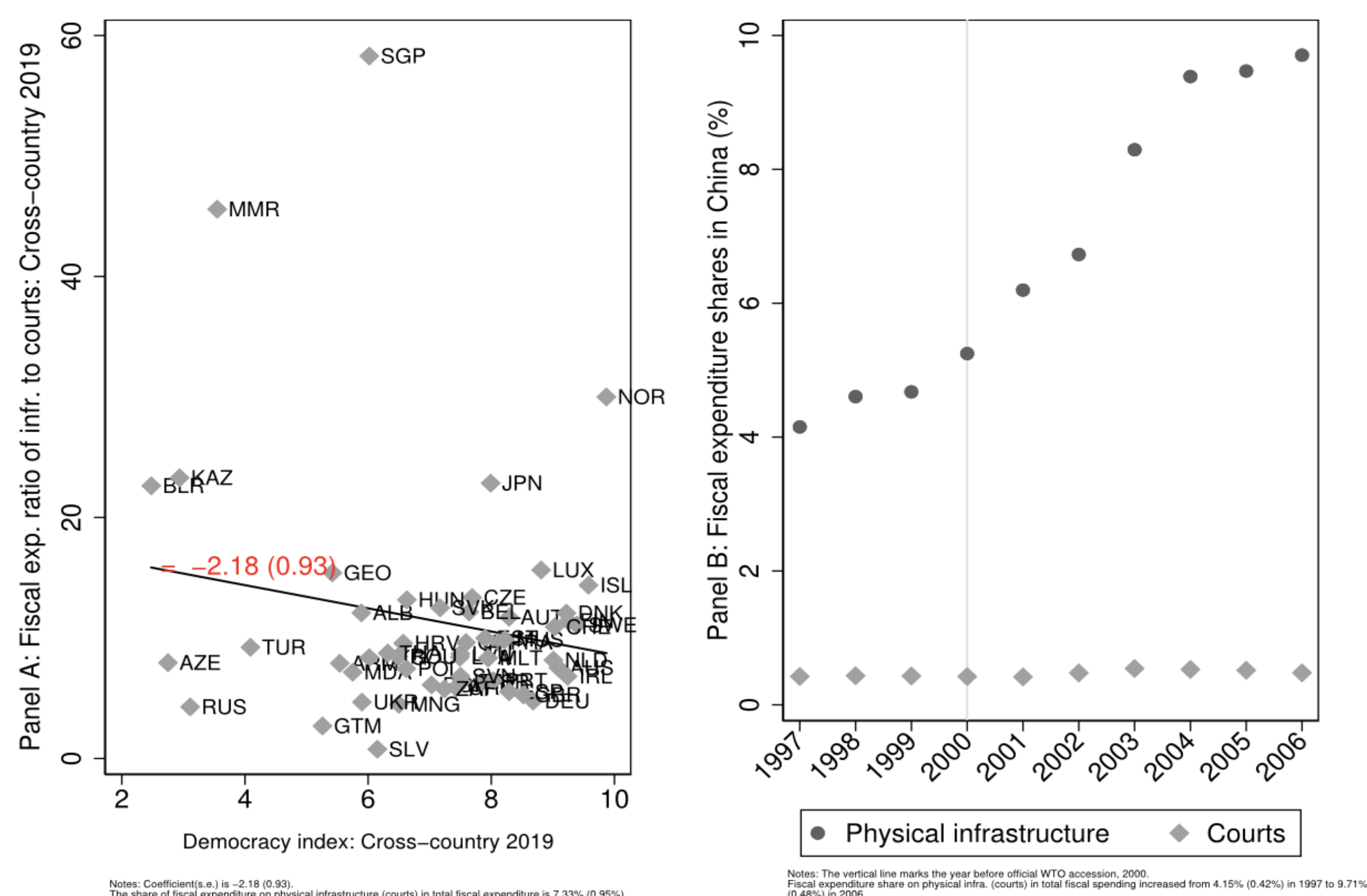


Abstract

This paper argues that political and market concentration levels explain why developing economies often underinvest in institutional infrastructure and legal capacity. Economic growth challenges this equilibrium, incentivizing rulers to invest in institutional infrastructure complementary to physical infrastructure. Rulers jointly invest to expand market entry and size only if they can secure higher rents and preserve institutions favoring concentration. The theoretical model predicts that physical infrastructure investment grows faster than institutional investment as market concentration rises. Using provincial coal reserve shares as an instrument for market concentration, a difference-in-differences analysis of Chinese data from 1997–2006 shows that the fiscal expenditure ratio of physical to institutional infrastructure increased 78% faster in provinces within the top market concentration quartile in 2000—the year before China joined the WTO.

Introduction: A Puzzle

Why do countries with high levels of political concentration invest more in physical infrastructure (e.g., roads) than institutional infrastructure (e.g., courts) compared with countries with low levels of political concentration, even though both are public goods and both need their collective action?



Theory: A Coordination Game

The production function:

$$f(e, T_i, T_p) = [(1 - \alpha_i - \alpha_p)e^\gamma + \alpha_i T_i^\gamma + \alpha_p T_p^\gamma]^{\frac{1}{\gamma}}$$

in which e , T_i , and T_p is private investment, institutional infrastructure and physical infrastructure respectively.

The model is an infinitely repeated coordination game. In each period, the ruling group allocates resources between physical and institutional infrastructure, anticipating the non-ruling group's investment response, while the non-ruling group chooses private investment to maximize its value function given the ruling group's investments in physical and institutional infrastructure:

$$\max_e V_n(e, T_i, T_p) = \{1 - [(1 - \alpha_p)\delta + \alpha_p]\} f(e, T_i, T_p) - k(e) \quad \max_{T_i, T_p} V_r(e, T_i, T_p) = [(1 - \alpha_p)\delta + \alpha_p] f(e, T_i, T_p) - T_i - T_p$$

$$s.t. V_n \geq \hat{V}_n$$

$$s.t. V_r \geq \hat{V}_r$$

Pareto-ranked equilibria exist when each player's payoff is a non-decreasing function of the other's strategy, indicating strategic complementarity. At the highest Pareto-ranked equilibrium, the main proposition follows:

Proxing market concentration as $c = \frac{\alpha_p}{\alpha_i}$, we have:

Proposition

Investment in physical infrastructure increases faster than institutional infrastructure

as market concentration rises, as shown in $\frac{d}{dc} \left(\frac{a(\frac{T_p}{T_i})}{\frac{dc}{dc}} \right) > 0$ when $\frac{dc}{dt} > 0$ and $\frac{d^2 c}{dt^2} > -\frac{c(1-\gamma)}{\gamma} \left(\frac{dc}{dt} \right)^2$.

Testable Hypothesis

Following the WTO shock, higher market concentration leads to faster rise in fiscal expenditure ratio on physical to institutional infrastructure in China.

Results

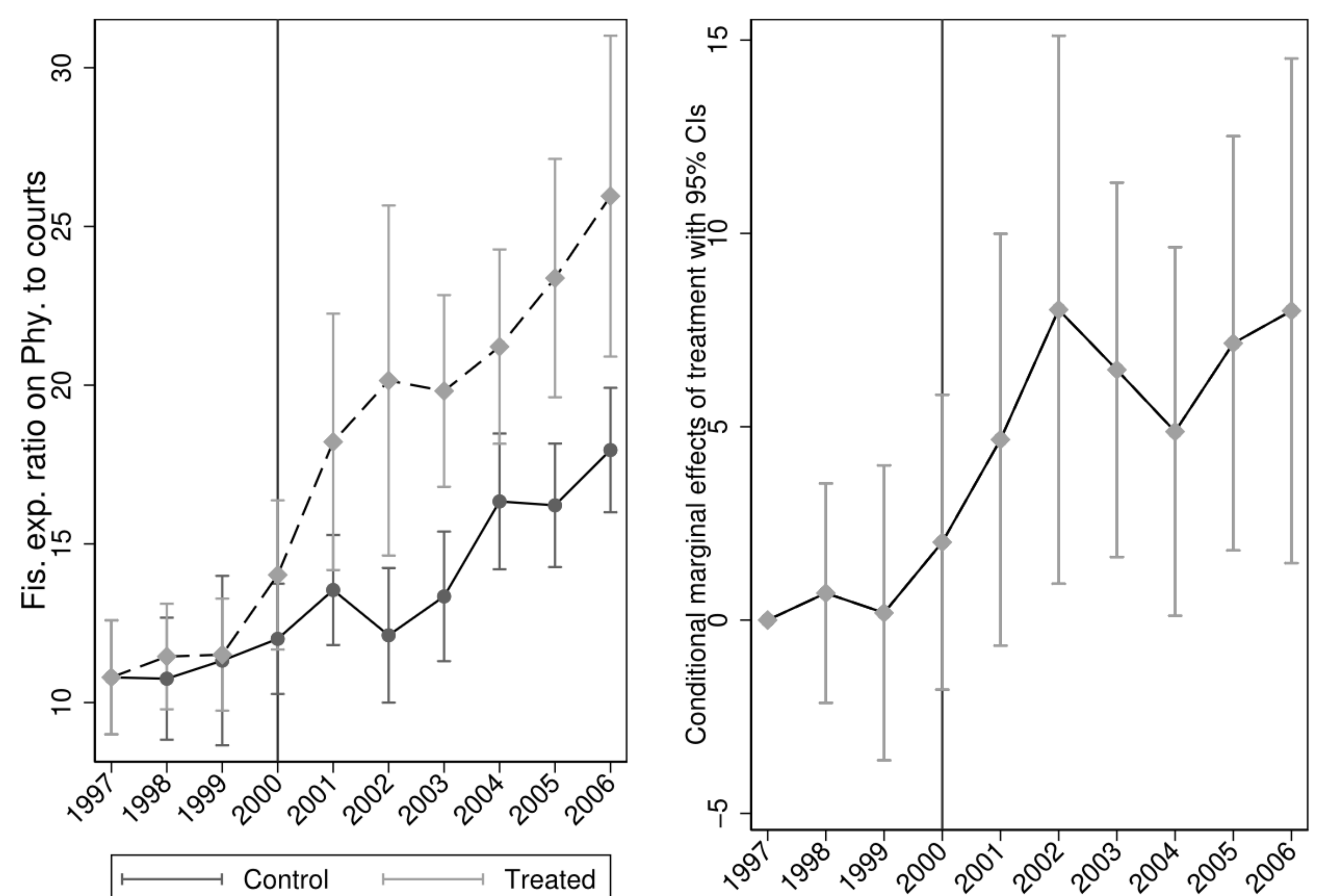
After the WTO accession, provinces with prior higher market concentration levels shifted 78% more public funds away from investing in courts toward physical infrastructure compared with their counterparts with lower market concentration levels.

Identification: Instrumented DiD

The baseline regression specification is:

$$FiscalRatio_{it} = \beta Concentration_{i2000} \times Post01_t + X'_{it}\gamma + \alpha_i + \lambda_t + \epsilon_{it} \quad (4.1)$$

in which $i \in [1, 30]$, $t \in [1997, 2006]$ respectively denotes province and year. $FiscalRatio_{it}$ represents either the fiscal expenditure ratio of physical infrastructure to courts or courts to physical infrastructure. $Concentration_{i2000}$ is a dummy variable equal to 1 for provinces in the treatment group and 0 for the control group. The treatment group includes provinces meeting at least one of these criteria in 2000 (pre-WTO accession): 1) market concentration levels (Zipf index) in the top quartile; or 2) coal mining industry share in local industrial output among the top five nationally. The second criterion includes Inner Mongolia, Anhui, and Henan, with Inner Mongolia and Anhui having Zipf indices in the top 30th percentile and Henan in the top 40th percentile. $Post01_t$ equals 1 for year 2001 and after, 0 otherwise. X_{it} represents control variables including population density, foreign direct investment (FDI) per capita, night light density, and the interaction of land ruggedness and year dummy. α_i and λ_t denote province and year fixed effects respectively. ϵ_{it} is the error term. The regressions use the full sample, as Table 10 in Appendix D shows no significant outliers in the data.



Pre-Treatment Trend and Treatment Effect: Fiscal Expenditure Ratio of Physical Infrastructure to Courts.

Trade shock, market concentration, and public goods provision.

The First Panel: Phy./Courts as the Second-Stage Dependent Variable				
Panel A: Second Stage		Panel B: First Stage		
Dependent Variable: Phy./Courts		Dependent Variable: Treated × PostWTO		
	(1)	(2)	(3)	(4)
Treated × PostWTO	11.180** (5.557)	11.732** (5.699)	Coal Reserve Share × PostWTO	2.866*** (.471)
Controls	N	Y	Controls	N
Province & Year FE	Y	Y	Province & Year FE	Y
Obs.#	300	300	Obs.#	300
Centered R ²	0.0206	0.0955	Centered R ²	0.1579
Mean of Y	14.984		KP Wald F test	36.432
The Second Panel: Courts/Phy. as the Second-Stage Dependent Variable				
Panel A: Second Stage		Panel B: First Stage		
Dependent Variable: Courts/Phy.		Dependent Variable: Treated × PostWTO		
	(1)	(2)	(3)	(4)
Treated × PostWTO	-.046* (.024)	-.048* (.025)	Coal reserve share × PostWTO	2.866*** (.471)
Controls	N	Y	Controls	N
Province & Year FE	Y	Y	Province & Year FE	Y
Obs.#	300	300	Obs.#	300
Centered R ²	0.0390	0.0884	Centered R ²	0.1579
Mean of Y	.082		KP Wald F test	36.432

Notes: Phy./Courts denotes the fiscal expenditure ratio of physical infrastructure to courts, while Courts/Phy. represents the inverse ratio. Control variables include population density, log real FDI per capita (1995 price), log nightlight intensity, and ruggedness-year dummy interactions. Fisher tests confirm no unit root in the fiscal expenditure ratio. Standard errors in parentheses are spatial and temporal autocorrelation-robust with province and year fixed effects, correcting for heteroskedasticity. A 259km distance cutoff (China's average provincial radius) assumes zero spatial correlation beyond this threshold, with a 9-period lag cutoff. The significance level indicators are * $p < .10$, ** $p < .05$, and *** $p < .01$.

Conclusions

The evidence highlight how political and market concentration shape underinvest in institutional infrastructure and legal capacity in nondemocracies. When market development generates sufficient returns, rulers may invest in institutional infrastructure complementary to physical infrastructure. Rulers make optimal investments in physical and institutional infrastructure to facilitate market expansion when they can secure greater rents while preserving concentration-favoring arrangements.

In the context of modern highly scalable technology, concentrated political power may extend limited rule-of-law protections for non-ruling groups even before within ruling groups when trade opportunities emerge and industrialization accelerates. This contrasts with the historical pattern under slower technological progress, where legal protections were first broadened within ruling groups and only later extended to non-ruling groups.

A more nuanced understanding of physical and institutional public goods provision (i.e., the coevolution of legal and fiscal capacity) is thus needed.

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References

- North, D.C., Wallis, J.J., Weingast, B.R., 2009. Violence and social orders: A conceptual framework for interpreting recorded human history. Cambridge University Press.
- Olson, M., 1965. The logic of collective action. Harvard University Press.
- Xu, C., 2011. The fundamental institutions of China's reforms and development. J. Econ. Lit. 49 (4), 1076–1151.
- Johnson, N.D., Koyama, M., 2017. States and economic growth: Capacity and constraints. Explor. Econ. Hist. 64, 1–20.