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Laying Off Old Guards to Rebuild State Capacity: Deng Xiaoping's Bloodless *Coup D'etat* in post-Mao China, 1980-2000

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Laying Off Old Guards to Rebuild State Capacity: Deng Xiaoping's Bloodless *Coup D'état* in post-Mao China, 1980-2000

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Abstract

This paper explores how changes in state capacity facilitates economic growth in an authoritarian system. This is the case of Deng Xiaoping's systematic replacement of government officials with a new army of better-educated technocrats which uprooted Maoist revolutionary cadres. Our assumption is that post-Mao economic growth can be taken as a proxy for state capacity improvement.

With a continuous treatment difference-in-differences strategy, this paper reveals that one percent increase in officials' replacement intensity results in 1.3 percent increase in GDP in post-Mao China. Moreover, effects are robust across various technical concerns and maintain stable over a period of four decades. Furthermore, our results explain 18.05 percent of the contemporary economic disparity between China's provinces (with intensity above and below the median).

These effects can be associated with improvements in officials' human capital which in turn rebuilt China's fiscal capability, re-started a market-friendly industrialization, and resumed grassroots self-governing institutions. All these have been achieved without a regime change in the People's Republic of China, hence, a 'bloodless *coup d'état*'.

1. Introduction

The state and state capacity are commonly considered crucial to economic growth.³

&⁴ But unlike in their developed counterparts, where states are efficient and

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³ E.g. Alexander Gerschenkron, *Economic Backwardness in Historical Perspective* (1962)' (Cambridge [MA] Harvard University Press, 1962); Lars Magnusson, *Nation, State And The Industrial Revolution: The Visible Hand* (London: Routledge Press, 2009).

⁴ Numerous works on state capacity, e.g. Douglass North, and Barry R. Weingast, 'Constitutions

accountable, developing countries often find their states manned by privileged officials and dogged by problems of law and order, tax collection, and public goods provision for social welfare, and so forth.⁵ State incapability can lead to ‘state

and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth-Century England’, *Journal of Economic History*, 49/4 (1989): 803-32; Douglass North, *Institutions, Institutional Change and Economic Performance* (Cambridge: Cambridge University Press, 1990); Hillel Soifer and Matthias Vom Hau, ‘Unpacking the Strength of the State: The Utility of State Infrastructural Power’, *Studies in Comparative International Development*, 43 (2008): 219-30; Cullen S. Hendrix, ‘Measuring State Capacity: Theoretical and Empirical Implications for the Study of Civil Conflict’, *Journal of Peace Research*, 47/3 (2010): 273-85; Francis Fukuyama, ‘What Is Governance?’, *Governance*, 26/3 (2013): 347-68; Jonathan K. Hanson, ‘Forging then Taming Leviathan: State Capacity, Constraints on Rulers, and Development’, *International Studies Quarterly*, 58/2 (2014): 380-92; Daron Acemoglu, Camilo García-Jimeno, and James A. Robinson, ‘State Capacity and Economic Development: A Network Approach’, *American Economic Review*, 105/8 (2015): 2364-2409; Daron Acemoglu, Jacob Moscona, and James A. Robinson, ‘State Capacity and American Technology: Evidence from the Nineteenth Century’, *American Economic Review*, 106/5 (2016): 61-7; Matt Andrews, Lant Pritchett, and Michael Woolcock, *Building State Capability: Evidence, Analysis, Action* (Oxford: Oxford University Press, 2017); Elissa Berwick and Fotini Christia, ‘State Capacity Redux: Integrating Classical and Experimental Contributions to an Enduring Debate’, *Annual Review of Political Science*, 21/1 (2018): 71-9; Luciana Cingolani, ‘The Role of State Capacity in Development Studies’, *Journal of Development Perspectives*, 2.1/2 (2018): 88-114; Stuti Khemani, ‘What Is State Capacity?’, *World Bank Policy Research Working Paper*, 8734 (2019); Pavithra Suryanarayan, ‘Endogenous State Capacity’, *Annual Review of Political Science*, 27 (2024).

⁵ José Antonio Cheibub, ‘Political Regimes and the Extractive Capacity of Governments: Taxation in Democracies and Dictatorships’, *World Politics*, 50/3 (1998): 349-76; Peter Evans and James E. Rauch, ‘Bureaucracy and Growth: A Cross-National Analysis of the Effects of ‘Weberian’ State Structures on Economic Growth’, *American Sociological Review*, 64/5 (1999): 748-65; Timothy Besley and Torsten Persson, ‘The Origins of State Capacity: Property Rights, Taxation, and Politics’, *American Economic Review*, 99/4 (2009): 1218-1244; Jan Luiten Van Zanden, *The Long Road to the Industrial Revolution: The European Economy in a Global Perspective, 1000-1800* (Leiden: Brill Press, 2009), vol. 1; Timothy Besley and Torsten Persson, ‘State Capacity, Conflict, and Development’, *Econometrica*, 78/1 (2010): 1-34; Luz M. Arias, ‘Building Fiscal Capacity in Colonial Mexico: From Fragmentation to Centralization’, *Journal of Economic History*, 73/3 (2013): 662-93; Noel D. Johnson and Mark Koyama, ‘Tax Farming and the Origins of State Capacity in England and France’, *Explorations in Economic History*, 51 (2014): 1-20; Tuan-Hwee Sng and Chiaki Moriguchi, ‘Asia’s Little Divergence: State Capacity in China And Japan before 1850’, *Journal of Economic Growth*, 19 (2014): 439-70; Nicola Gennaioli, and Hans-Joachim Voth, ‘State Capacity and Military Conflict’, *Review of Economic Studies*, 82/4 (2015): 1409-1448; Nafisa Akbar and Susan L. Ostermann, ‘Understanding, Defining, and Measuring State Capacity in India: Traditional, Modern, and Everything in Between An Asian Survey Special Issue on India’, *Asian Survey*, 55/5 (2015): 845-61; Didac Queralt, ‘From Mercantilism to Free Trade: A History of Fiscal Capacity Building’, *Quarterly Journal of Political Science*, 10/2 (2015): 221-73; Mark Dincecco and Gabriel Katz, ‘State Capacity and Long-Run Economic Performance’, *Economic Journal*, 126/590 (2016): 189-218; Noel D. Johnson and Mark Koyama, ‘States and Economic Growth: Capacity and Constraints’, *Explorations in Economic History*, 64 (2017): 1-20; María Franco Chuaire, Carlos Scartascini, and Mariano Tommasi, ‘State Capacity and the Quality of Policies. Revisiting the Relationship between Openness and Government Size’, *Economics & Politics*, 29/2 (2017): 133-56; Mark Dincecco, *State Capacity and Economic Development: Present and Past* (Cambridge: Cambridge University Press, 2017); Francisco Garfias, ‘Elite Competition and State Capacity Development: Theory and Evidence from Post-Revolutionary Mexico’, *American Political Science Review*, 112/2 (2018): 339-57; Laszlo Bruszt and Nauro F. Campos, ‘Economic Integration and State Capacity’, *Journal of Institutional Economics*, 15/3 (2019): 449-68; Thomas Brambor, Agustín Goenuga, and Jan Teorell, ‘The Lay of the Land: Information Capacity and the Modern State’, *Comparative Political Studies*, 53/2 (2020): 175-213; Timothy Besley, Robin Gurgess, Adnan Khan,

failures', as commonly recognized.⁶ In most cases, a democracy is absent, meaning that citizens in these countries are unable to choose state power-holders to stop bad policies. So, the economy may be trapped in a developmental *cul-de-sac*.

Conceptually, however, if a non-democratic but benevolent and enlightened state decides to escape from a developmental *cul-de-sac*, it may replace its loyal old guards entrenched in the state apparatus with a different type of bureaucrats through officials' replacement schemes and gains a new lease of life. This was the case of administrative reforms under Deng Xiaoping in 1980s: The Maoist revolutionary cadres, many of whom were promoted during Cultural Revolution and before and had been in leadership since then, were systematically replaced between 1982 and 1984.⁷ Younger and more educated officials, new technocrats,

and Guo Xu, 'Bureaucracy and Development', *Annual Review of Economics*, 14/1 (2022): 397-424; Mark Dincecco and Yuhua Wang, 'State Capacity in Historical Political Economy', *Oxford Handbook of Historical Political Economy*, C13-P1 (2022).

⁶ Jean-Germain Gros, 'A Taxonomy of Failed States in the New World Order: Decaying Somalia, Liberia, Rwanda and Haiti', *Third World Quarterly*, 17/3 (1996): 455-72; Daron Acemoglu, Simon Johnson, and James Robinson, 'The Rise of Europe: Atlantic Trade, Institutional Change, and Economic Growth', *American Economic Review*, 95/3 (2005): 546-79; Morten Bøås and Kathleen M. Jennings, 'Insecurity and Development: The Rhetoric of the "Failed State"', *European Journal of Development Research*, 17/3 (2005): 385-95; Jean-Germain Gros, 'Towards Morten Bøås and Kathleen M. Jennings' "Failed States" and "State Failure": Threats or Opportunities?' *Globalizations*, 4/4 (2007): 475-85; Shahar Hameiri, 'Failed States or a Failed Paradigm? State Capacity and the Limits of Institutionalism', *Journal of International Relations and Development*, 10 (2007): 122-49; Stewart Patrick, '"Failed" States and Global Security: Empirical Questions and Policy Dilemmas', *International Studies Review*, 9/4 (2007): 644-62; Charles T. Call, 'The Fallacy of the "Failed State"', *Third World Quarterly*, 29/8 (2008): 1491-1507; James A. Piazza, 'Incubators of Terror: Do Failed and Failing States Promote Transnational Terrorism?', *International Studies Quarterly*, 52/3 (2008): 469-88; Neil A. Englehart, 'State Capacity, State Failure, and Human Rights', *Journal of Peace Research*, 46/2 (2009): 163-80; Robert I. Rotberg (ed.), *When States Fail: Causes and Consequences* (Princeton: Princeton University Press, 2010); Priyanka Pandey, 'Service Delivery and Corruption In Public Services: How Does History Matter?', *American Economic Journal: Applied Economics*, 2/3 (2010): 190-204; Benjamin A. Olken and Rohini Pande, 'Corruption in developing countries', *Annual Review Economics*, 4/1 (2012): 479-509; Lant Pritchett, Michael Woolcock, and Matt Andrews, 'Looking Like a State: Techniques of Persistent Failure in State Capability for Implementation', *Journal of Development Studies*, 49/1 (2013): 1-18; Daron Acemoglu and James A. Robinson, *Why Nations Fail: The Origins of Power, Prosperity, and Poverty* (New York: Crown Business Press, 2013); Xin Meng, Nancy Qian, and Pierre Yared, 'The Institutional Causes Of China's Great Famine, 1959-1961', *Review of Economic Studies*, 82/4 (2015): 1568-1611; Francisco Garfias and Emily A. Sellars, 'When State Building Backfires: Elite Divisions and Collective Action in Rebellion', *American Journal of Political Science*, 66/4 (2021): 977-92; Jonathan K. Hanson and Rachel Sigman, 'Leviathan's Latent Dimensions: Measuring State Capacity for Comparative Political Research', *Journal of Politics*, 83/4 (2021): 1495-1510.

⁷ We define the Maoist cadres as officials who are promoted and still employed between the Cultural Revolution and Deng's replacement shock (1966-82), a criterion which may be subjective. However, historically Mao's loyal 'revolutionary cadres' of different age groups controlled China's state power successfully during the Cultural Revolution. They replaced the previously functional government departments ultra-left revolutionary committees (as detailed in Section 2). We thus

took up key positions in the state. We take Deng Xiaoping’s officials’ replacement scheme as an opportunity to examine whether or not qualities of government officials matter for economic growth and through what mechanisms (e.g. state capacity)?

This study takes up two steps. First, we summarize key historical facts related to Deng’s government officials’ replacement scheme and establish correlations between officials’ replacement and economic growth. A rise of the new government personnel served as a one-off shock in 1982-84 with a 30 to 45 percent replacement rate at the provincial level, four times greater than the norm *hitherto*. This change added 2.5-years on the average schooling of officials (a 20-percent increase). China’s afresh economic growth followed thereafter. The rest is history.

We thus call Deng’s officials’ replacement scheme a ‘bloodless *coup d’état*’, simply because a Leninist party-state does not distinguish the state from the ruling party, nor does it distinguish bureaucrats from politicians. Consequently, an army of ‘poli-bureaucrats’ run a party-state. Thus, any sudden change in policy direction depends on the make of ‘poli-bureaucrats’ who run the party-state. In other words, only when the post-Mao government was manned by a different breed of ‘poli-bureaucrats’, did different political and economic agendas and goals become possible.

Second, this study undertakes a rigorous econometric exercise with a continuous treatment difference-in-differences (DiD) strategy.⁸ We leverage the plausibly exogenous variation in officials’ replacement magnitude across provinces, determined by political factors, as our treatment intensity.

choose this cohort as an index of Maoist cadres (see Section 4).

⁸ Despite a uniform façade of China’s political system, local (provincial) leadership officials often have the discretionary power to decide whether or to what extent a certain policy is implemented. This is often deliberate for the purpose of ‘testing the water’ which in turn grants the significance of officials’ role more than non-party-states. The best example was the creation of ‘special economic zones’ (*jingji tequ*) to allow capitalist market economy to operate on China’s communist soil, see Yi Lu, Jin Wang and Lianming Zhu, ‘Place-Based Policies, Creation, and Agglomeration Economies: Evidence from China’s Economic Zone Program’, *American Economic Journal: Economic Policy*, 11/3 (2019): 325-60.

Our assumption is that post-Mao economic growth can be taken as a proxy for state capacity improvement. Our first finding is that replacing Maoist cadres with technocrats did indeed facilitate China's economic growth. On average, one percent increase in officials' replacement magnitude leads to 1.3 percent increase in GDP. The estimates remain positive and significant with controls for resource endowment, transportation cost, foreign trade, Maoist political legacy, human capital, urbanization, and climate. In a nutshell, by reversing Mao's state failures, Deng's China not only avoided economic collapse but also achieved an economic miracle. Findings from this study thus provides a different aspect regarding China's reforms for better economic performances.⁹

Regarding whether or not high replacement-density and low replacement-density provinces are comparable with one another, we control for the pretreatment covariates interacted with time (year) dummies, together with several independent approaches. Firstly, our dynamic estimates imply no statistically significant pre-trends between high- and low-replacement provinces before the replacement shock. The effects were persistent over four decades and account for 18.05 percent of the contemporary economic disparity between high- and low-replacement provinces. Thus, the government officials' replacement scheme was unlikely driven by other potential unobservables or shocks. Secondly, our estimates satisfy the 'average treatment effect function' assumption, with which the officials' replacement intensity was not driven by observables and hence, low-replacement provinces could serve as a counterfactual for high-replacement provinces. Thirdly, our findings are robust to the standard two-way fixed effects (TWFE) DiD estimator and several recently developed robust DiD estimators. Fourthly, our estimates pass a falsification test (where we randomly assign replacement intensity to each province and generate a simulated distribution). As our true estimate lies outside of the simulated distribution, it indicates that the other estimates were unlikely to be driven by unobservables. Fifthly, we examine different measures of economic growth and the inverse hyperbolic sine (IHS)

⁹ Dwight H. Perkins, 'Reforming China's Economic System', *Journal of Economic Literature*, 26/2 (1988): 601-45; Chenggang Xu, 'The Fundamental Institutions of China's Reforms and Development', *Journal of Economic Literature*, 49/4 (2011): 1076-1151.

transformation, with which our estimates remain significant. Finally, the observed effects are not driven by the arbitrary choice of a baseline year (for the calculation of replacement magnitude). These results collectively support a causal interpretation of our findings that the intensive government officials' replacement in 1982-84 was likely to contribute to China's economic growth in the following decades.

Mechanisms through which the government officials' replacement might facilitate economic growth are multi-fold: First, the replacement scheme significantly increased officials' average educational level. Second, the replacement scheme improved government revenue and expenditure. Third, the replacement scheme deregulated the Maoist *extra-economic coercion* and promoted market-friendly industrialization. Finally, Deng's technocrats might tolerate pluralistic institutions in society.

This paper contributes to the existing literature in three ways. Firstly, it adds the debate on economic impact of politically officials' replacement.¹⁰ Most existing works examine how officials' replacement changes government performance in a *democratic* context.¹¹ At best, they link patronage to personnel establishment,¹²

¹⁰ Frederico Finan, Benjamin A. Olken, and Rohini Pande, 'The Personnel Economics of the Developing State', *Handbook of Economic Field Experiments*, 2 (2017): 467-514; see also Besley, et al., 'Bureaucracy and Development'.

¹¹ Sam Asher and Paul Novosad, 'Politics and Local Economic Growth: Evidence from India', *American Economic Journal: Applied Economics*, 9/1 (2017): 229-73; Ernesto Dal Bó, Frederico Finan, Olle Folke, Torsten Persson and Johanna Rickne, 'Who Becomes a Politician?' *Quarterly Journal of Economics*, 132/4 (2017): 1877-1914; Fernanda Brollo, Pedro Forquesato, and Juan Carlos Gozzi, 'To the Victor Belongs the Spoils? Party Membership and Public Sector Employment in Brazil', *Working Paper* (2017), available on 1st October, 2024, *vide*: <https://www.semanticscholar.org/paper/To-the-Victor-Belongs-the-Spoils-Party-Membership-Brollo-Forquesato/02a48336f32a0b6e40c63465ec5e971ef59ed528>; Fernanda Brollo, Katja Kaufmann, and Eliana La Ferrara, 'The Political Economy of Program Enforcement: Evidence from Brazil', *Journal of the European Economic Association*, 18/2 (2020): 750-91; Emanuele Colonnelli, Mounu Prem, and Edoardo Teso, 'Patronage and Selection in Public Sector Organizations', *American Economic Review*, 110/10 (2020): 3071-3099; Mitra Akhtari, Diana Moreira, and Laura Trucco, 'Political Turnover, Bureaucratic Turnover, and the Quality of Public Services', *American Economic Review*, 112/2 (2022): 442-93; Klenio Barbosa and Fernando Ferreira, 'Occupy Government: Democracy and the Dynamics of Personnel Decisions and Public Finances', *Journal of Public Economics*, 221 (2023): 104856.

¹² Guo Xu, 'The Costs of Patronage: Evidence from the British Empire', *American Economic Review*, 108/11 (2018): 3170-3198; Emanuele Colonnelli, Mounu Prem, and Edoardo Teso, 'Patronage and Selection in Public Sector Organizations', *American Economic Review*, 110/10 (2020): 3071-3099.

and how personal connections dictate officials' behaviour.¹³ This paper is the first to study officials' replacement in an authoritarian system in a wholesale fashion with magnitude beyond personal patronages.

Secondly, this paper contributes to the literature on the evolution in relationship between the state and economic performance. Various studies have investigated roles of the fiscal state which had incentives in promoting private property rights, trade, and more generally, inclusive institutions.¹⁴ Rather than an evolution, this paper shows a sudden break-away in a well-defined state agendas and momentum (known as Maoism) with which the state and state capacity were rebuilt through the replacement of officials with whom the state agendas and momentum were altered beyond recognition.

Thirdly, this paper provides a new insight for China's economic miracle in during the recent decades without a regime change,¹⁵ an important factor which has been touched upon by a recent inspiring textual study.¹⁶ We make one step further to provide a rigorous econometric analysis for a causal link between an overhaul of government officials and economic growth success in a non-democratic context.

The rest of the paper is organized as follows. Section 2 illustrates the historical background of Maoism, state failures, and post-Mao government officials' replacement scheme in 1982-84 under Deng Xiaoping. Section 3 describes data. Section 4 reports the effects of government officials' replacement on economic

¹³ Brollo, et al., 'To the Victor Belongs the Spoils?'; Barbosa and Ferreira, 'Occupy Government'; Colonnelli, et al., 'Patronage and Selection'.

¹⁴ Robert E. Hall and Charles I. Jones., 'Why Do Some Countries Produce So Much More Output per Worker Than Others?' *Quarterly Journal of Economics*, 114/1 (1999): 83-116; Abhijit Banerjee and Lakshmi Iyer, 'History, Institutions, and Economic Performance: The Legacy of Colonial Land Tenure Systems in India', *American Economic Review*, 95/4 (2005): 1190-1213; Mark Dincecco and Gabriel Katz, 'State Capacity and Long-Run Economic Performance', *Economic Journal* 126/590 (2016): 189-218; Daron Acemoglu, Simon Johnson, and James Robinson, 'Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution', *Quarterly Journal of Economics*, 117/4 (2002): 1231-1294; Acemoglu, et al., 'The Rise of Europe'; Acemoglu, and Robinson, *Why Nations Fail*.

¹⁵ Xu, 'Fundamental Institutions'; Perkins, 'Reforming China's Economic System'.

¹⁶ Chen Hao, Saul Wilson, Changxin P. Xu, Cheng Cheng and Yuhua Wang, 'Dethroning the Mao-era Elite, Clearing the Way for Reform', *China Quarterly*, 258 (2024): 346-66.

growth. Section 5 discusses potential mechanisms. Section 6 draws final conclusions.

2. Historical background

China's history in the second half of the twentieth century serves an invaluable case study for state failure and its revival. Simply put, Mao's China from 1949 to 1976 was littered with political and economic disasters. Remarkably, after Mao died in 1976, Deng Xiaoping, a different leader of Mao's generation, managed to turn China's misfortune around without a regime change.

2.1. State failures under Mao's rule

To highlight Mao's state failures, one only needs to look at four nation-wide campaigns: (1) the 1957-58 Anti-Rightist Purge affecting society, (2) the 1958-61 Great Leap Forward affecting society, (3) the 1959 purging the military throughout the 1964-65 purging grassroots party organisation, affecting the party-state government, (4) the following 1966-76 Cultural Revolution, purging both society and the party-state. Each purge campaign incurred astronomical accounting and opportunity costs to the economy and society.

Firstly, it was the anti-rightist purge which systematically persecuted over half a million intellectuals (or 10 percent of the educated), the *crème dela crème* for a new regime allegedly aiming to achieve modernity. Western educated intellectuals – typically university professors and top engineers and administrators were particularly vulnerable and purposely targeted.¹⁷ Many were ended in China's gulag camps after being falsely accused.¹⁸ It is commonly agreed that after this purge the door for free speech in Mainland China was firmly shut.

¹⁷ For official figures, see Cong Jin, *Quzhe Fazhande Suiyue (Period of Tortuous Development)* (Zhengzhou: Henan People's Press, 1989), p. 61; see also Li, *Memoir on Mao*, p. 132.

¹⁸ For a case called 'The Narrow Valley' (*Jiabian Gou*) in the Gobi Desert in remote Gansu, see survivors' accounts: He Fengming, *Jingli – Wode 1957 Nian (The Year 1957 When A Disaster Struck on Me)* (Lanzhou: Dunhuang Literature and Art Press, 2001); Yang Xianhui, *Jiabian Gou Jishi (Diary in the Narrow Valley)* (Shanghai: Shanghai Literature and Art Press, 2003).

Secondly, it was the Great Leap Forward. In August 1958, Mao set the target for his Politburo to catch up with Britain by saying that 'Even by trial and error [*qigao bagao*] we only need fifteen years to catch up or surpass Britain in iron output.'¹⁹ He also set his eye on the Soviet Union, saying that 'It won't take us so long to get 51 million tons of iron.'²⁰ The project, commonly called 'Big Push for Iron and Steel Output' (*dalian gangtie*), draughted 90-100 million rural labourers (or one labourer per rural family of five) to produce iron and steel in backyard furnaces (*tutie, tugang*). By denying peasant right to grow their own food, Mao's campaign was directly responsible for the largest peace-time and good-weather famine in human history.²¹ In the course of the following three years, 30-40 million people died of starvation (on average one victim in every 2.3-3.0 rural households).²² The rural hungry were forbidden to beg for food in cities on the one hand; Mao's state provided no sizeable famine relief on the other. The exposure of the scale and scope of this famine within the party-state apparatus forced Mao to step down in a party conference of 7,000 top officials (*qiqianren dahui*) in 1962.²³ Regarding Mao's iron and steel campaign, the verdict of the conference was '30 percent natural disasters and 70 percent of human errors' (*sanfen tianzai, qifen renhuo*).²⁴ Mao's 'human errors' were further defined identified as 'left-wing adventurism',²⁵ a post-mortem notoriety that stuck to Mao personally.²⁶

¹⁹ Li Rui, *Dayuejin Qinli Ji (Personal Experience of the Great Leap Forward)* (Shanghai: Far East Press, 1996), p. 292.

²⁰ Song Haiqing, *Renmin Gongshe Xingwang Lu (Rise and Fall of the People's Commune)* (Urumqi: Xinjiang Youth Press, 2000), vol. 2, pp. 403-4.

²¹ In 1958, the weather was extremely favourable for farming; see Wang Hong, 'Yueru Gongchang Zhuyide Beizhuan Shijian' (Sad Practice of Communism), *Yanhuang Chunqiu (History of the Chinese)*, 1 (2006): 26.

²² This is the generally agreed range; see Becker, *Hungry Ghost*, ch. 18; Jin, 'Three Years of Natural Disasters'; Cao, *Great Famine and China's Population*. See also He Shu, 'Lun Zaofanpai' (A Study of the 'Cultural Revolutionaries'), in Song Yongyi (ed.), *Wenhua Dageming: Lishide Zhenxiang He Jiti Jiyi (The Cultural Revolution: Historical Truth and Collective Memories)* (Hong Kong: Tianyuan Books, 2007), vol. 1, pp. 516-7; Li Jingyan, 'Qiqianren Dahuide Gongji Jiqi Juxianxing' (Merits and Limits of the '7,000 Party Official Conference'), *Yanhuang Chunqiu (History of the Chinese)*, 8 (2007): 4-5; Yang Jisheng's *Mubei – Zhongguo Liushi Niandai Dajihuang Jishi (Gravestone for the Great Leap Famine Victims, Evidence from History)* (Hong Kong: Tiandi Books, 2008).

²³ Li, 'Merit and Limit of the '7,000 Party Official Conference'.

²⁴ Zhang Suhua, *Bianju – Qiqianren Dahui Shimo (Turning Point - 7,000 Party Official Conference)* (Beijing: China's Youth Press, 2006), pp. 303-12.

²⁵ Zhang, *Turning Point*, ch. 9.

²⁶ See Chinese Communist Party Central Committee, 'Resolution on Certain Questions in the History of Our Party Since the Founding of the People's Republic of China', passed by the Sixth Plenary Session of the Eleventh Central Committee of the Chinese Communist Party in 1981,

Thirdly, it was the disastrous decade-long Cultural Revolution which began with a seven-year long prelude back to the said 1959 and 1964-65 inner-party purges. This time, the purge was set with two steps: Step One (1966-69) was marked by Mao's turning the gun outwards against the whole population in general, and the urban citizens in particular (*à la* the 1957 Anti-rightists); Step Two (1969-76) was characterised with Mao's turning the gun inwards against his own party-state apparatus *per se*.

During Step One (1966-69) schools, universities and factories were shut down to free masses who became street mobs for a revolution of 'exterminating the four olds' (*jiu sixiang, jiu wenhua, jiu fengsu, jiu xiguan* – 'old thought, old culture, old customs, and old habits'). Now, public order was in jeopardy, as Mao's loyalists went wild beating people and raiding their homes, known as 'torture, vandalism, and robbery' (*da za qiang*); unlawful imprisonment was rampant; large scale sectarian violence, called 'armed struggle for power between rebels' (*wu dou*), also broke out in all provinces.²⁷

Step One was a short pain comparing with Step Two (1969-76) which was staged with overthrowing 'capitalist roaders inside the communist party' (*dangnei zouzipai*). As a result, all levels of the communist party organisations and government departments were forcefully replaced by 'revolutionary committees' (*geweihui*), made of hand-picked local workers, peasants and army officers, and backed by martial law.²⁸ All such 'revolutionary committees' were answerable to

passim, available on 1st October, 2024, online *vide*: <https://digitalarchive.wilsoncenter.org/document/resolution-certain-questions-history-our-party-founding-peoples-republic-china>.

²⁷ One case which is documented as 'December 1966, two rival workers' groups armed with 10,000 assault rifles in Chongqing (Sichuan) clashed. The fighting lasted for two years. In all, 10,000 cannon shells and a million rounds of bullets were fired. All the arsenals in the region were levelled to the ground.' See Pang Guoyi, 'Chongqing Wudou Yu Wenge Qunmu' (Military Clash in Chongqing and the Cultural Revolution Cemetery), *Yanhuang Chunqiu (History of Chinese)* 3 (2007): 52-4. Another high-profile case involved Wang Hongwen, a thug of Shanghai who was later hand-picked by Mao as Vice-Chairman of the Party. Wang was personally responsible for the 1967 bloodshed in the Shanghai Diesel Factory where his 100,000 followers attacked their rivals of the similar number and caused 2,000 deaths. See Jin Feng, 'Wang Hongwen Wang Xiaoyu Caifang Zhuiji' (Recollection of Interviews with Wang Hongwen and Wang Xiaoyu in the Heat of the Cultural Revolution), *Yanhuang Chunqiu (History of Chinese)*, 5 (2006): 40-2.

²⁸ This is less known part of the Cultural Revolution; see Xiao Jiwen, 'Wengezhongde Sanzhi Lianjun' (The Army's Role in 'Supporting the Leftists, Workers and Peasants, and Implementing

Mao personally. So, after 1969 the ‘government’ in China was one that was of, by and for Mao in a perfect dictatorship.²⁹

It is now agreed that the lingering 1959-76 purges were constituted ‘an erroneous struggle against the so-called anti-Party clique of Peng Zhen, Luo Ruiqing, Lu Dingyi and Yang Shangkun and the so-called headquarters of Liu Shaoqi and Deng Xiaoping’,³⁰ and ‘led to domestic turmoil and brought catastrophe to the Party, the state and the whole people’,³¹ and Mao’s muddling with state affairs ‘did not turn “great disorder under heaven” into “great order under heaven”, nor could it conceivably have done so’.³²

Mao’s Cultural Revolution alone victimized 100 million citizens and cost the economy 800 billion *yuan*,³³ equivalent to the total capital stock of the state-owned enterprises in 1979.³⁴ On another count, it cost China 28 million tons of steel and 40-billion-*yuan* worth fiscal revenue, leaving the economy on the brink of collapse.³⁵

On the human capital front, the Cultural Revolution exacerbated a post-1957 trend of anti-education. On the eve of the Cultural Revolution when 0.6 percent of the population had tertiary education but 34 percent of the population in Mainland China still remained illiterate (1964 data).³⁶ But that was Mao’s best record. From

Military Training and the Martial Law’ during the Cultural Revolution), *Wenshi Jinghua (Essence of Culture and History)*, 5 (2003): 6-13; see also Deng Lifeng, ‘Sanzhi Lianjun Shulun’ (Supporting the Leftists, Workers and Peasants, and Implementing Military Training and Martial Law), *Dangdai Zhongguoshi Yanjiu (Research in Contemporary Chinese History)*, 6 (2001): 39-52.

²⁹ For the damning historic verdict, see Chinese Communist Party Central Committee, ‘Resolution on Certain Questions’, *passim*.

³⁰ Chinese Communist Party Central Committee, ‘Resolution on Certain Questions’, Section 21.1.

³¹ *Ibid.*, Section 20.4.

³² *Ibid.*, Section 20.4.

³³ Jiang Yuanming, *Wangshi 1966 Xiezhen (Memory of 1966)* (Tianjin: Hundred-Flower Art Press, 1998), p. 3.

³⁴ For China’s 1953 GDP, see National Bureau of Statistics, *Statistical Year Book, 2002*, p. 51. For the state assets, see Xi Xuan and Jin Chunming, *Wenhua Dagemin Jianshi (A Short History of the Great Cultural Revolution)* (Beijing: Central Party History Press, 1996), pp. 349, 352.

³⁵ Hua Guofeng (Party Chairman of the time), ‘Tuanjie Qilai, Wei Jianshe Shehuizhuyide Xiandaihua Qianguo Er Fendou’ (United to Build a Socialist Modern Power), *Renmin Ribao (People’s Daily)*, 27th February 1978, p. 1.

³⁶ National Bureau of Statistics, *Zhongguo Nongcun Zhuhu Diancha Nianjian, 2002 (China’s Rural Households Survey Year Books, 2002)* (Beijing: China’s Statistics Press, 2002), p. 11; National Bureau of Statistics, *Statistical Year Book, 2003*, p. 99.

1966 to 1973, functional universities and tertiary students both stopped (see Table 1). It has been estimated that the close-down of the high education sector during the Cultural Revolution cost China at least one million university graduates and several million polytechnic qualifiers.³⁷

Table 1. Mao's Track Record of Higher Education

Year	Functional universities	Tertiary students
1960	1,289	961,623
1965	434	674,436
1960-65, annual %	-24.3	-7.4
1966-73	0	0
1965-73 annual %	0	0

Source: Liu Haifeng, 'Zhongguo Gaodengjiaoyu Fazhande Qifu Yu Jintui' (Fluctuations, Forward and Backward in China's Tertiary Education), *Xiandai Daxue Jiaoyu (Modern University Education)*, 2 (2001): 9.

In addition, drastic measures were imposed on China's schooling population, Mao sent them to the rural sector known as 'going up to mountains and down to the countryside' (*shangshan xiaxiang*). Towards the end of his rule, a total of 16 million urban teenagers were sent to the rural sector and were asked to stay there indefinitely. Mao sugar-coated his policy as 're-educating the urban youth'. In 1968, he explained his anti-education mentality as: 'In my view, there is not much difference in the basic training between senior high schools, junior high schools and senior primary schools on the one hand and universities on the other. The basic curricula are all but repetitious at the same level. University specialised courses are all run by professors who know nothing about their subjects.³⁸ ... The real universities are factories and farms.'³⁹

Now, three inter-linking state failures can be established from 1957 to 1976, which counted for 70 percent of Mao's rule of China. The impact of Mao's state failures can be seen in several areas. First of all, regardless of official GDP figures, China's economy remained agriculture dominated. China's economic structure was

³⁷ Tong Dalin and Hu Ping, *Zhongguode Kexue Jishu Shiye, 1977-1980 (China's Science and Technology, 1977-1980)* (Beijing: People's Press, 1982), p. 24.

³⁸ Anon., *Mao Zedong's Thought*, p. 693.

³⁹ *Ibid.*, p. 695.

compatible with Japan, Russia and India before their industrial take-off (Table 2). A genuine structural change of the economy occurred only after Deng's reforms. In 1997, for the first time the share of China's rural employment dropped to 50 percent of China's total workforce from Mao's track record of 77 percent.⁴⁰

Table 2. Employment Shares under Maoism, % Total Population

Case	All sectors	Agriculture	Non-agriculture
China, 1975	100	77	23
Japan, 1872	100	72	28
India, 1901	100	65	35
Russia, 1914	100	75	25

Sources: Li Jingwen, 'Lun Woguo Chanye Jiegoude Biandong Qushi' (Trend of Structural Change in China's Economy), *Xinhua Wenzhai (Xinhua Compilation)*, 12 (1995): 46-8; Zhang Zhuoyuan, 'Zhongguo Jingji Tizhi Gaigede Zongti Huigu Yu Zhanwang' (Review and Speculation of the Reform of China's Economic System), *Xinhua Wenzhai (Xinhua Compilation)*, 7 (1998): 48-50; N. Charlesworth, *British Rule and the Indian Economy, 1800-1914* (London: MacMillan, 1982), p. 20; A. Feuerwerker, 'The State and the Economy in Late Imperial China', *Theory and Society*, 13/3 (1984): 299, 302, 312-13; K. Chao, *Man and Land in Chinese History: An Economic Analysis* (Stanford: Stanford University Press, 1986): ch. 3; R. Minami, *The Economic Development of Japan* (London: MacMillan, 1986), p. 24; S. G. Wheatcroft, R. W. Davies, and J. M. Cooper, 'Soviet Industrialization Reconsidered: Some Preliminary Conclusions about Economic Development between 1926 and 1941', *Economic History Review*, 39/2 (1986): 273; P. Maitra, *Indian Economic Development. Population Growth and Technical Change* (New Delhi: Ashish, 1991), pp. 101, 132; P. Francks, *Japanese Economic Development: Theory and Practice* (London: Routledge, 1992), p. 29; R. W. Davies, M. Harrison, and S. G. Wheatcroft, *The Economic Transformation of the Soviet Union, 1913-1945* (Cambridge: Cambridge University Press, 1994), p. 112; P. R. Gregory, *Before Command: An Economic History of Russia from Emancipation to the First Five-Year Plan* (Princeton: Princeton University Press Gregory, 1994), pp. 21, 42; National Bureau of Statistics, *Statistical Year Book, 2003* (Beijing: China's Statics Press, 2003), p. 34.

Secondly, it was mass poverty that lays the blame for the Mao's mismanagement after the private ownership was systematically outlawed in the 1950s. In the 1960s to 70s, China's national Engel's coefficient stayed high at 0.7, meaning that 70 percent of ordinary people's income was spent on food.⁴¹ This was worse than China's own Republican Period record during the 1920s and 30s when Engel's coefficient in six poor northern provinces; while cities like Shanghai, Tianjin and Wuhan had a Engel's coefficient lower than 0.6,⁴² comparable with Britain, Japan

⁴⁰ National Bureau of Statistics, *Statistical Year Book, 2003*, p. 34.

⁴¹ He Bochuan, '2000 Nian Zhongguo Mubiao Xitongde 20 Ge Cuiruodian' (Twenty Weak Points in China's Targets for the Year 2000), *Xinhua Wenzhai (Xinhua Compilation)*, 5 (1994): 8.

⁴² Bureau of Social Affairs of Shanghai, *The Cost of Living Index Numbers of Laborers, Great Shanghai, January 1926 – December 1931* (Shanghai: Bureau of Social Affairs of Shanghai, 1932),

and India at the time.⁴³ China's high Engel's coefficient was compatible with its paucity in mass consumption (Table 3).

Table 3. Basic Human Consumption per Capita, 1937/49 vs 1978

Year	Grain (kg)	Meat (kg)	Urban Housing (M ² /person)
1937	307.0	13.6	—
1949	—	—	4.6
1978	195.5	1.2	3.6
Change (%)	-36.3	-91.2	-21.7

Note: Foods were in annual amounts per capita.

Sources: Based on Yu Guangyan (ed.), *China's Socialist Modernization* (Beijing: Foreign Language Press, 1984), p. 12; Zhao Deqin, 'Zhongguo Jingji Wushinian Fazhande Lujing Jieduan Yu Jiben Jingyan' (Path, Stages and Main Lessons from the 50-year Long Growth of the Chinese Economy), *Zhongguo Jingjishi Yanjiu (Study of Chinese Economic History)*, 1 (2000): 100. Data for 1937 and 1965 are based on Cao Shuji, *Zhongguo Renkoushi (A Demographic History of China)* (Shanghai: Fudan University Press, 2001), vol. 6, p. 561; and World Bank, *China, Socialist Economic Development* (Washington, D.C.: World Bank, 1983), vol. 1, p. 108. For housing, see Zhong Dajun, *Guomin Daiyu Bupingdeng Shenshi (Assessment of Unequal Entitlement amongst Citizens)* (Beijing: China's Workers' Press, 2002), p. 169. Data for 1978 is from: National Bureau of Statistics, *Zhongguo Tongji Nianjian, 2003 (China's Statistical Year Book, 2003)* (Beijing: China's Statistics Press, 2003), pp. 40, 378.

Thirdly, social security in terms of disaster relief was poor: The Maoist disaster relief took well under one percent in the aggregate government expenditure. In comparison, state-owned capital investment scheme received at least 26 times of the sum for disaster relief in any given year (Table 4). It explains partly why and how so many people died of the Great Leap Famine.

p. 18; Li Wenhui, Xia Mingfang and Huang Xingtao (eds), *Minguo Shiqi Shehui Diaocha Congbian, Chengshi Laogong Shenghuojuan (Selected Social Surveys of the Republican Period, Volume on Urban Workers)* (Fuzhou: Fujian Education Press, 2005), vol. 1, pp. 25, 26, 358; vol. 2, pp. 2, pp. 758, 827, 1225.

⁴³ Li *et al.*, *Social Surveys*, vol. 1, pp. 273, 359. For Meiji Japan's Engel's coefficient together with widespread poverty, see also S. B. Hanley, *Everyday things in Premodern Japan* (Berkeley: University of California Press, 1997), p. 171 and *passim*.

Table 4. Comparison between State Capital Investment and Disaster Relief*, 1952-75

Year	New investment (I)	Relief expenses (II)	Total expenditure (III)	I/III (II/III)
1952	4.7	0.1	17.6	0.27 (0.006)
1957	12.4	0.2	30.4	0.41 (0.007)
1960	35.4	0.4	65.4	0.54 (0.006)
1965	15.8	0.6	46.6	0.34 (0.013)
1975	32.7	0.6	82.0	0.40 (0.007)
Average				0.39 (0.008)

Note: * In billion *yuan*, constant prices.

Source: Ministry of Finance, *Zhongguo Caizheng Nianjian, 2000* (China's Financial Year Book, 2000) (Beijing: China's Finance Magazine Press, 2000), pp. 392-3, 402, 416-7.

Fourthly, the provision of public health service was minimal. In 1981, China had in total just two million hospital beds and 1.2 million registered medical doctors for a population of over one billion.⁴⁴ On average, there were five hospital beds and three doctors for every 10,000 population which ranks Mao's China with Afghanistan (four hospital beds/10,000, in 2001), Cambodia (six beds/10,000, in 2004), Guatemala (five beds/10,000, in 2003), Myanmar (six beds/10,000, in 2000), Somalia (four beds/10,000, in 1997), and Yemen (six beds/10,000, in 2003).⁴⁵ As a result, Mao's China had very high infant mortality rates: 165 per 1,000 births in 1965.⁴⁶ For obvious reasons, such a rate was unlikely to be maintained during the following decade of the Cultural Revolution. The same level of infant mortality (165/1,000 births) applied in 2004 only to the poorest countries on earth with low life expectancies of around 40: Afghanistan, Angola, Liberia, Niger, Sierra Leone and Somalia.⁴⁷ A large sample from the World Health Organization reveals that with an infant mortality rate of 100 per 1,000, a country's life expectancies cannot exceed 50.⁴⁸ Mao's medical provision did not support China's officially claimed life expectancies above 60.

⁴⁴ Yu Guangyuan (ed.), *China's Socialist Modernization* (Beijing: Foreign Language Press, 1984), p. 740.

⁴⁵ World Health Organization, *World Health Statistics 2006* (Geneva: WHO, 2006), pp. 59-61.

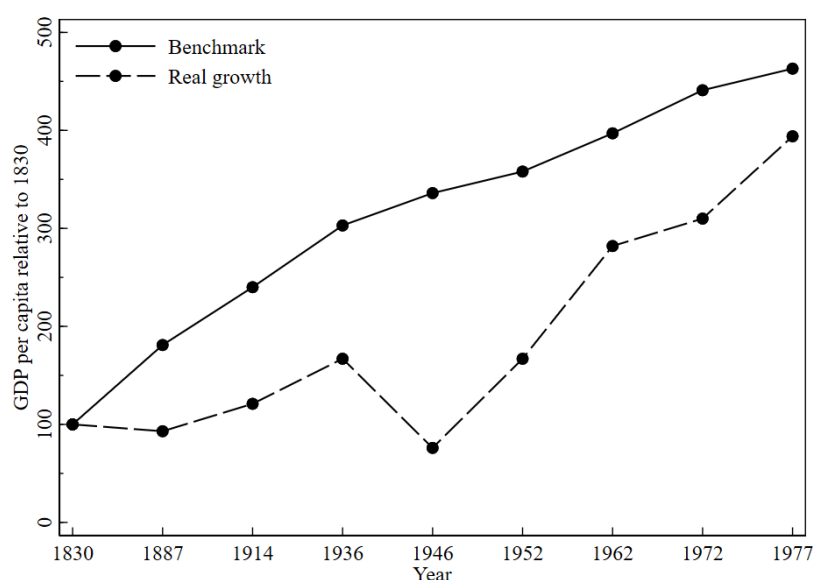
⁴⁶ Perkins, 'Reforming China's Economic System', pp. 638, 640.

⁴⁷ World Health Organization, *World Health Statistics 2006*, pp. 22-6.

⁴⁸ *Ibid.*, p. 28.

Finally, it was the per capita GDP performance. Figure 1 is comparison between a stylized Qing growth benchmark and China's real growth in per capita GDP with 1830 as a modest baseline, thanks to China's celebrated long history. The former is set at a modest annual rate of 1.23 percent which was actually achieved by China in the 1830s. So, conceptually, until the Qing benchmark was reached, China's economy underperformed. The latter is what really happened. China's per capita GDP recovered in 1952 from the 1936 pre-War World Two level and managed to grow 2.35 times by 1977. However, by 1977, China's per capita GDP level was still 15 percent lower than the Qing benchmark.

Figure 1. Benchmark vs Real Growth in per Capita GDP, 1830-1977



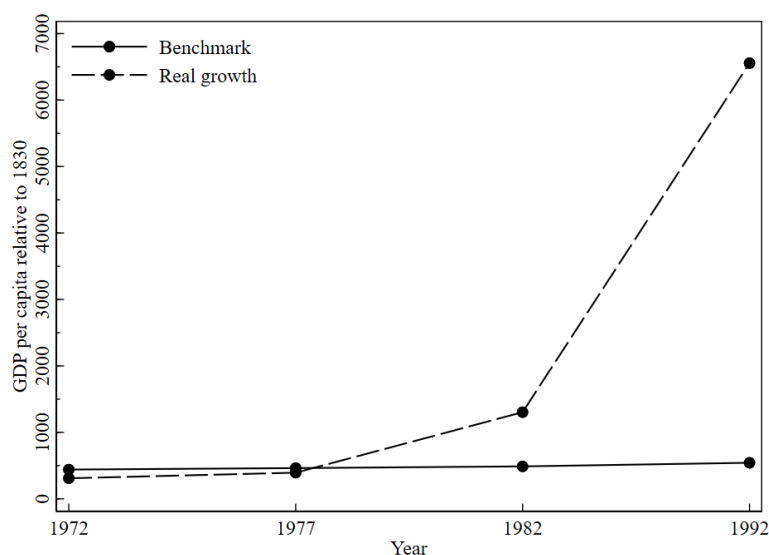
Note: Solid line – China's own premodern growth achieved during the late Qing Period as an indigenous growth benchmark at 1.23 % per year; dashed line – China's actual growth.

Sources: The Qing benchmark is based on Albert Feuerwerker, 'The State and the Economy in Late Imperial China', *Theory and Society*, 13/3 (1984): 297-326; Liu Ti, '1600–1840 Nian Zhongguo Guonei Shengchan Zongzhide Gusuan' (Estimation of China's GDP between 1600 and 1840), *Jingji Yanjiu (Economic Study)*, 10 (2009): 144-55. The actual growth is based Liu Foding and Wang Yuru, *Zhongguo Jindaide Shichang Fayu Yu Jingji Zengzhang (Market Development and Economic Growth in Early Modern China)* (Beijing: Tertiary Education Press, 1996), p. 44; Liu Foding, Wang Yuru and Zhao Jin, *Zhongguo Jindai Jingji Fazhan Shi (A History of Economic Development in Early Modern China)* (Beijing: Tertiary Education Press, 1999), p. 66; National Bureau of Statistics, *China's Statistical Year Book, 2002*, p. 51. Data for 1982 to 2010 in a constant price are based on China's National Bureau of Statistics, '2-3 Bubianjia Guonei Shengchan Zhongzhi' (GDP in Constant Prices); available on 1st October, 2024; online *vide*: China's National Bureau of Statistics website: <https://www.stats.gov.cn/sj/ndsj/2012/indexeh.htm>.

There is a stark contrast in per capita GDP between Mao and post-Mao eras measured by the same Qing benchmark. Deng's reforms were a real game-changer:

By 1992, China's per capita GDP was 16 times Mao's level and 12 times Qing benchmark, respectively.

Figure 2. Benchmark vs Real Growth in per Capita GDP, 1972-1992



Note: The same as Figure 1.

Sources: The same as Figure 1.

With all the above aspects, Mao's China ticked just about all the boxes of state failures, be they the economy, law and order, public goods provision for social welfare. In 1977, China was trapped in a developmental *cul-de-sac* and the country's future looked bleak.

2.2. Deng's 1982-84 administrative reform

There is a vast body of literature on Deng's reforms, much of which has discussed the nitty-gritty of the reforms.⁴⁹ For the current purpose, the real challenge faced

⁴⁹ See D. W. Chang, *China under Deng Xiaoping: Political and Economic Reform* (Basingstoke: Macmillan, 1988); Terry Cannon and Alan Jenkin, *The Geography of Contemporary China: the Impact of Deng Xiaoping's Decade* (London: Routledge, 1990); M. Ying-Mao Kau and S. H. Marsh (eds), *China in the Era of Deng Xiaoping: a Decade of Reform* (Armonk [NY]: M.E. Sharpe, 1993); Richard Evans, *Deng Xiaoping and the Making of Modern China* (London: Hamish Hamilton, 1993); D. S. Goodman, *Deng Xiaoping and the Chinese Revolution: A Political Biography* (New York: Routledge, 1994); Shao-chuan Leng, *Reform and Development in Deng's China* (Lanham: University Press of America, 1994); Weiwei Zhang, *Ideology and Economic Reform under Deng Xiaoping, 1978-1993* (London: Kegan Paul International, 1996); Maurice Meisner, *The Deng Xiaoping Era: an Inquiry into the Fate of Chinese Socialism, 1978-1994* (New York: Hill and Wang, 1996); R. F. Ash and Y. Y. Kueh (eds), *The Chinese Economy under Deng Xiaoping* (Oxford: Oxford University Press, 1996); M. E. Marti, *China and the Legacy of Deng Xiaoping: from Communist Revolution to Capitalist Evolution* (Washington, D.C.: The Brassey's, 2002).

by Deng and his fellow reformers was how to provide the population with an exit from the Mao's gross mismanagement for three long decades without a regime change.

Deng's idea was to abandon Mao's obsession with 'class struggle' and turn the party's attention to a 'socialist market economy',⁵⁰ an ideological oxymoron which was further defined open-endedly as 'socialism with Chinese characteristics'. Now, China's leadership was reconnected to the 'market' to rescue China's failed economy left by Mao. The modifiers of 'socialist' and 'Chinese characteristics' served an ambivalent purpose of keeping the rule of the party-state intact at the same time.⁵¹ Meanwhile, Deng announced that 'Modernisation is the key to solving our internal and external problems [associated with Maoism]. By the end of this century, we must try our best to reach a GDP at 1,000 American Dollars per head and live a reasonably comfortable life [*xiaokang*].'⁵² This was elaborated and summarized as 'four modernisations' (*sige xiandaihua*) of China's industry, agriculture, national defence, and science and technology. Here, the ideological dogma of communism simply vanished.⁵³

Deng's new approach contradicted the ideological stance of Maoist revolutionary cadres. Not only was the term 'market' considered derogatory in the Maoist vocabulary, but the use of the 'American dollars' as a benchmark for a 'comfortable material life' also led to serious repercussions under Mao's rule. Mao justified his

⁵⁰ '[The Party] firmly discarded the slogan "Take class struggle as the key link" which had become unsuitable in a socialist society and made the strategic decision to shift the focus of work to socialist modernization.' See Chinese Communist Party Central Committee, 'Resolution on Certain Questions', Section 26.

⁵¹ Gu Shutang, *Shehuizhuyi Shichang Jingji Lilun Yanjiu (A Model for Socialist Market Economy)* (Beijing: China's Audit Press, 2001), ch. 3, pp. 12, 17.

⁵² Li Li-an and Zheng Keyang (eds), *Deng Xiaoping Yu Gaige Kaifang Shisi Nian (Deng Xiaoping and Fourteen Years of Reforms and Opening Up)* (Beijing: Beijing Normal University Press, 1993), p. 14.

⁵³ In the party's jargon, it was officially announced as 'After socialist transformation was fundamentally completed, the principal contradiction our country has had to resolve is that between the growing material and cultural needs of the people and the backwardness of social production. It was imperative that the focus of Party and government work be shifted to socialist modernization centering on economic construction and that the people's material and cultural life be gradually improved by means of an immense expansion of the productive forces.' See, Chinese Communist Party Central Committee, 'Resolution on Certain Questions', Section 35.1. All these would make Mao turn in his grave.

life-long approach as ‘revolutionising people’s mind with an empty stomach’.⁵⁴ Fully aware of the controversy, Deng publicly announced that ‘Our officials have hesitated in reforms. They have feared of too much capitalism in China. The criterion to judge whether we are with capitalism or with socialism is to see whether we improve people’s living standards.’⁵⁵ This was a *coup* considering the stated mission of the party under Mao that was to engage solely with ‘class struggle’ rather than material well-being of the ordinary citizens.⁵⁶

Deng’s new roadmap required China’s state capacity to be overhauled. To ensure this, what came immediately after Deng coming into power was a tsunami of replacement of state officials: The generation of ‘old guards of Maoism’ was aggressively substituted by a new generation of *de facto* technocrats. Cleverly, Deng achieved his stated goal of ‘streamlining government departments to increase administrative efficiency’,⁵⁷ & ⁵⁸at same time making a large number of Maoist cadres redundant who otherwise would have continued Mao’s legacy of ultra-left ideology and policies. All this was done within a decade after Mao died.

⁵⁴ In 1958, Mao published a short essay (barely one page long) in which he openly praised mass poverty by saying that ‘China with its 600 million people is known for its poverty and zero achievements [*yiqiong erbai*]. ... But this is a good thing. Poverty makes you contemplate changes which means making a revolution.’ Mao Zedong, ‘Jieshao Yige Hezuoshe’ (Introducing a Rural Co-opt), *Hong Qi (Red Flag)*, 1 (1958): 2.

⁵⁵ Deng Xiaoping, ‘Zai Wuchang, Shenzhen, Zhuhai, Shanghai Dengdide Tanhua Yaodian’ (Outline of Talks in Wuchang, Shenzhen, Zhuhai, and Shanghai), in Deng Xiaoping, *Deng Xiaoping Wenxuan (Selected Works of Deng Xiaoping)* (Beijing: People’s Press, 1993), vol. 3, p. 372.

⁵⁶ The 1981 party verdict on this was two-fold: (1) ‘Comrade Mao Zedong widened and absolutized the class struggle, ... He went a step further and asserted that, throughout the historical period of socialism, the bourgeoisie would continue to exist and would attempt a comeback and become the source of revisionism inside the Party.’ See Chinese Communist Party Central Committee, ‘Resolution on Certain Questions’, Section 17. And (2) ‘[Mao’s] theoretical and practical mistakes concerning class struggle in a socialist society became increasingly serious, his personal arbitrariness gradually undermined democratic centralism in Party life and the personality cult grew graver and graver.’ See *ibid.*, Section 18. See also Zhang Hua and Su Caiqing (eds), *Huizhou Wedge, Zhongguo Simian Wedge Benxi Yu Fans (Recollection of the Decade of Cultural Revolution, Analyses and Soul-Researching)* (Beijing: Chinese Communist Party History Press, 2000), vol. 2, p. 1098.

⁵⁷ Figure A1 in Appendix shows a consistent pattern of streamlining government departments with a cut by 40 percent between 1982 and 1987. For detail, see: https://www.gov.cn/test/2009-01/16/content_1206981.htm.

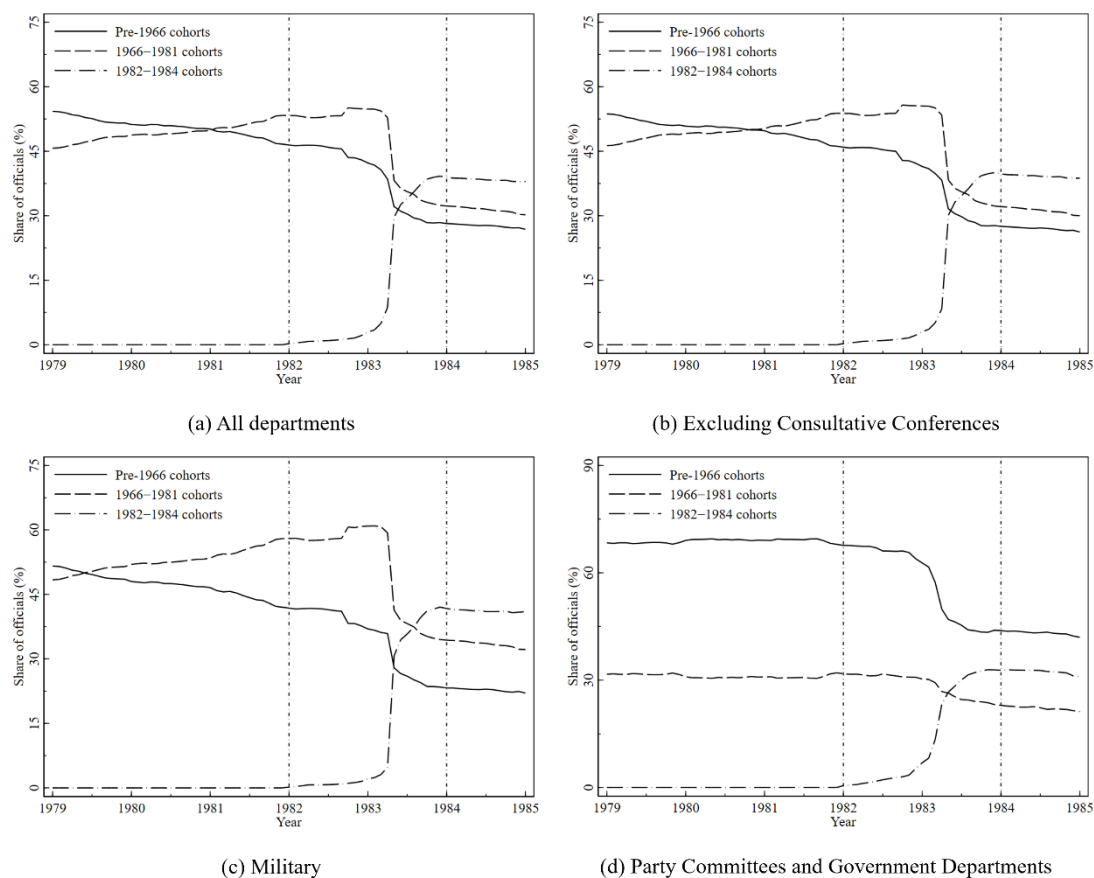
⁵⁸ China has a singular state with a vertical commanding structure, and Beijing’s policies can reach the grassroots level. Reshuffling ministries in the central government in Beijing usually creates either simultaneous or lagged impacts on corresponding branches in local governments. As a result, our identification strategy in Section 4 accounts for these common trends, ensuring that they are absorbed and do not bias our main estimates.

Evidence of Deng's government officials' replacement is shown in Figure 3. Overall, the Maoist cadres systematically stepped down in every state department.⁵⁹ Across all departments (Panel a), the share of a newly promoted cohort counted for 40 percent in two short years (1982-84), surpassing the number of Maoist cadres. This pattern is consistent when the 'consultative conferences' are excluded (Panel b).⁶⁰ The replacement rates varied across departments, ranging from 45 percent in military (Panel c) to 30 percent in civil services (Panel d). Replacement of government officials caused the decision-making power to shift (indexed by the share of officials). Overall, this replacement resulted in a reformist government which was manned by a new group of officials with a political commitment different from Maoism.

⁵⁹ See definition of Maoist cadres in Footnote 7.

⁶⁰ Consultative conferences had little decision-making power within the party-state, compared with (1) the military, (2) the higher-level policy-making party committees, and (3) the lower level policy-making government departments.

Figure 3. Officials' Replacement under Deng Xiaoping, 1982-84

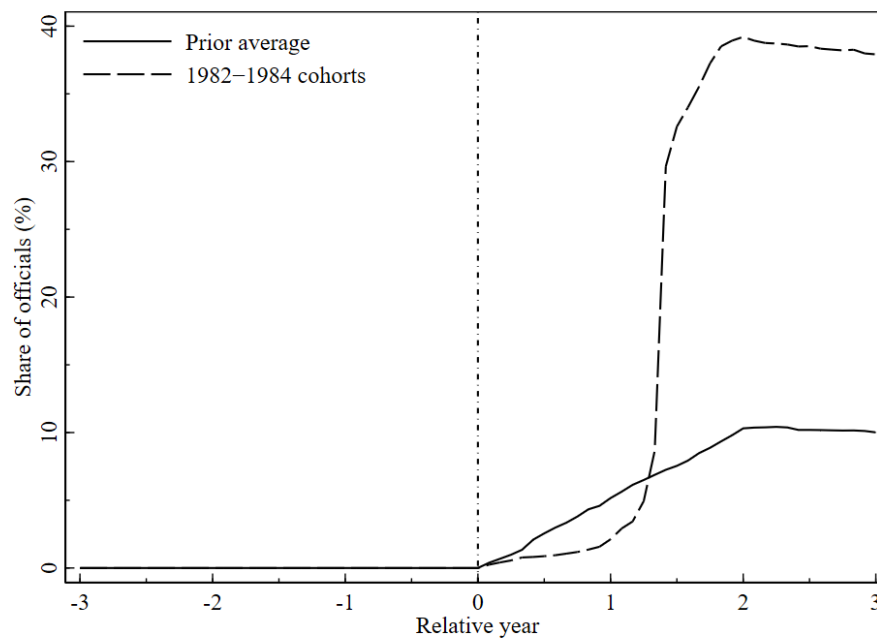


Note: We use province-year-level aggregates based on *China's Organizational History Dataset*. The x-axis represents time (in years). The outcome variables (y-axis) represent the share of certain cohorts of officials. Officials are assigned to a cohort based on the year they were first promoted to provincial leadership positions. Official are excluded if their positions were below or above the province-level as ineligible. Eligible officials are categorized into three groups: early Maoist officials (prior to 1966), late Maoist cadres (1966-81), and new Deng's technocrats (1982-84). Panel (a) includes all departments; Panel (b) takes out officials of Consultative Conferences (*zhengxie huiyi*); Panel (c) is for the military; Panel (d) is for party committees and government departments.

Source: Hao Chen, Saul Wilson, Changxin Patrick Xu, Cheng Cheng, and Yuhua Wang, *China's Organizational History Dataset*. First published in 2023; available on 1st October, 2024; online *vide*: <https://search.dataone.org/view/sha256:cf4bf78a46d725f9a9916180ce650a979f4e6cade2a4cc05f8491db46f79b332>.

This reform-cum-replacement exhibits two important features. The first is the shock nature of officials' replacement. Comparing the gradual increase in the prior group, the 1982-84 cohort had a sharp rise of 40 percent (See Figure 4).

Figure 4. Inter-Cohort Comparison of Official Promotion

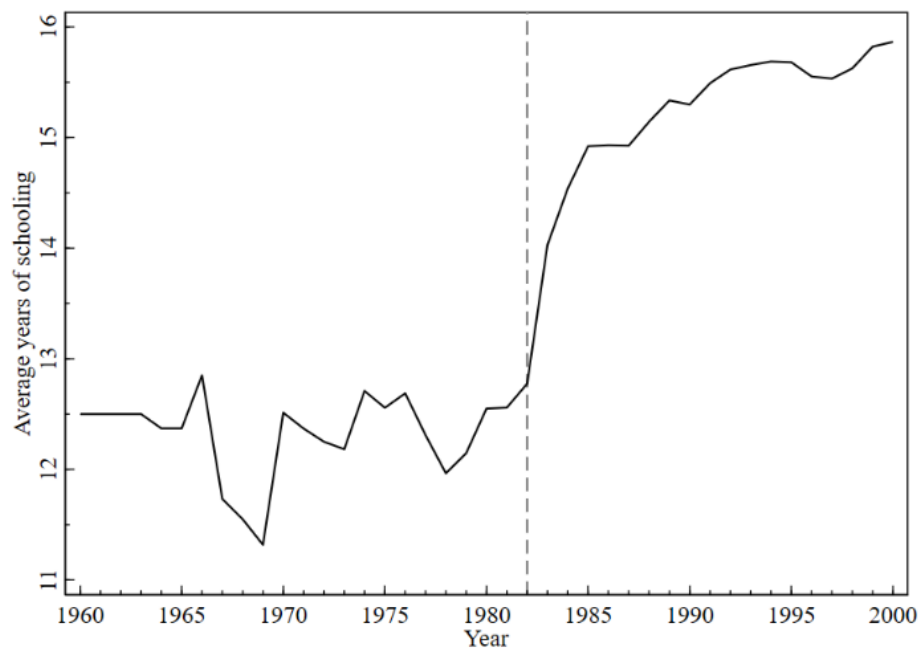


Note: Using cohort-relative year-level data, this figure compares the promotion of the replacement cohort with the average of the promotion of previous cohorts.

Source: Hao et al., *China's Organizational History Dataset*.

The second feature is the exogenous magnitude. The share of the new cohort is approximately four times larger than the average share of previous cohort, marking a significant discontinuity in the government personnel system (Figure 5). The combination of the sudden rise and the significant magnitude enabled Deng's reforms to go ahead smoothly.

Figure 5. Officials' Average Years of Schooling at the Replacement Shock

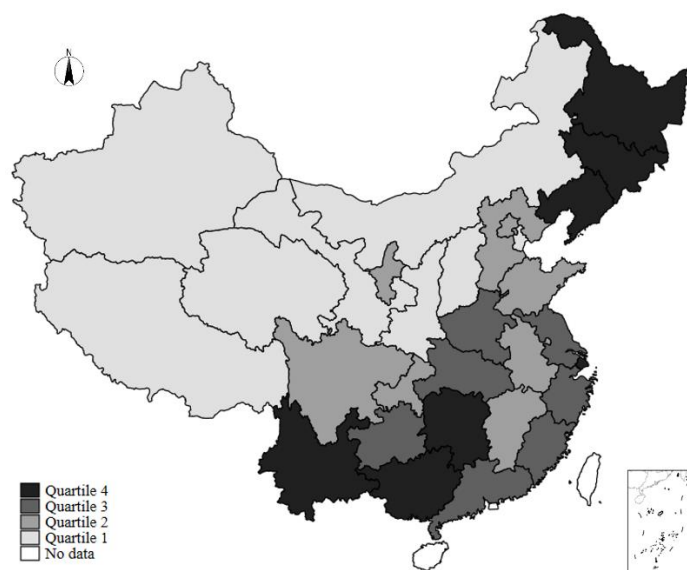


Note: Using year-level data, this figure draws the evolution of years of education for officials before and after Deng's officials' replacement shock.

Source: Junyan Jiang, 'China's Political Elite Dataset', available on 1st October 2024, online *vide*: <https://www.junyanjiang.com/data.html>

Geographically, however, Deng's officials' replacement took place disproportionately took place in east and south China (Figure 6).

Figure 6. Geographical Distribution of Replacement Magnitude across Provinces



Note: The definition of ‘replacement magnitude’ is made in Section 4: $100 \times (\text{Share of Maoist cadres in 1981} - \text{Share of Maoist cadres in 1984}) / \text{Share of Maoist officials in 1981}$.

Source: Hao et al., *China’s Organizational History Dataset*.

With the replacement shock, there was a sharp increase in years of schooling received by government officials. Before 1982, the average years of schooling was 12 years, with some periods showing a decline, particularly during the late 1960s and early 1970s due to the Cultural Revolution. The average years of schooling among government officials increased in 1982 by 2.5 years, or 20 percent. This trend continued steadily since then until they reached a plateau around 16 years (in the late 1990s). This upward trend in education levels suggests newly established meritocracy for technocrats of better human capital.⁶¹

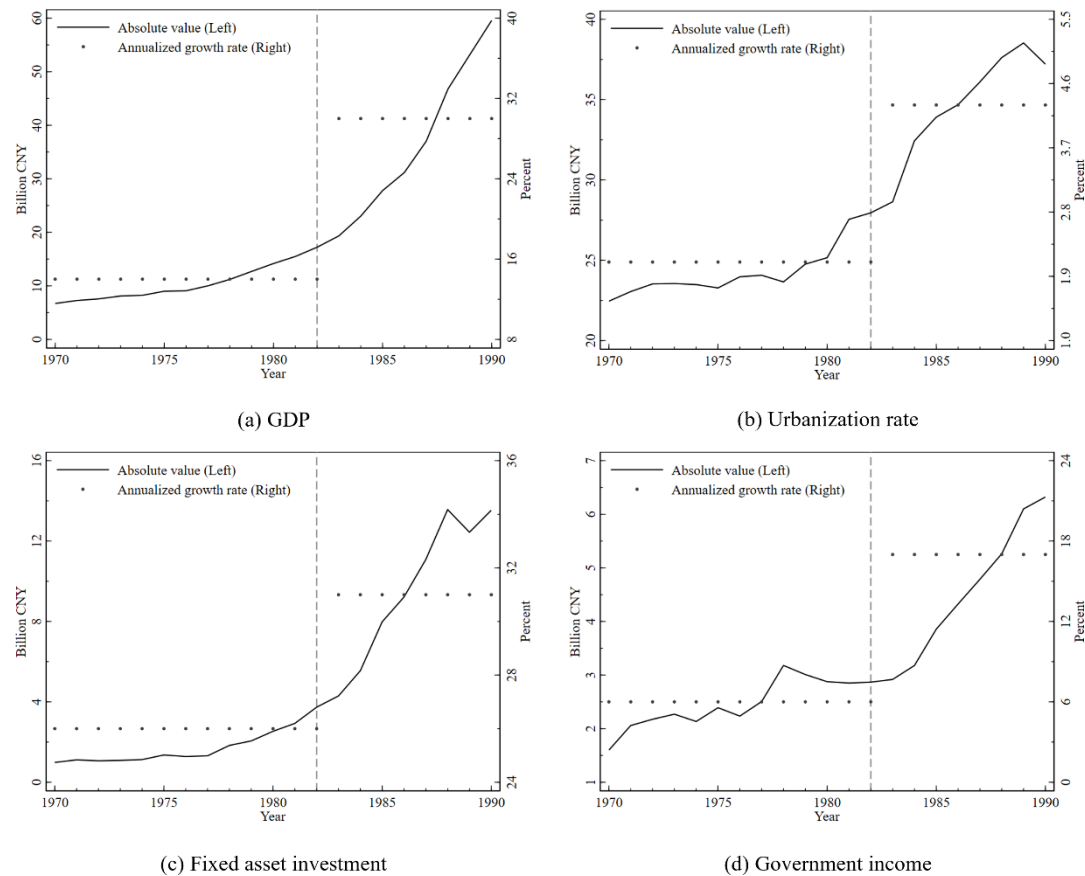
With revolutionary officials removed, China had for the first time a new group of educated technocrats in charge. As a result, the economy bounced back and forged ahead for fast industrialization and modernization at an unprecedented scale, scope and speed in Asia.

Figure 7 shows a rapid expansion of the economy after the replacement shock, measured in GDP (Panel a), urbanization rate (Panel b), fixed asset investment (Panel c), or government revenue (Panel d). The annual growth rate changed by a

⁶¹ For the human capital argument, see Hall and Jones, ‘Why Do Some Countries Produce So Much More Output per Worker Than Others?’

factor of 2: 14 percent vs. 30 percent for GDP, 2.1 percent vs. 4.3 percent for urbanization rate, and 6 percent vs. 17 percent for government revenue), leaving fixed asset investment more or less intact (26 percent vs. 31 percent for fixed asset investment).⁶²

Figure 7. Officials' Replacement Shock and Dynamics of the Economy, 1980-90



Note: Using province-year-level data aggregated based on 60 Years of New China, this figure draws the dynamics of main economic outcomes before and after Deng's replacement shock (1984). The x-axis represents time (in years). The outcome variables (y-axis) represent GDP in billion (Panel a), urbanization rate in percent (Panel b), fixed asset investment in billion (Panel c), and government revenue in billion (Panel d).

Sources: National Bureau of Statistics, *Xin Zhongguo 60-Nian Tongji Ziliao Huibian* (Compilation of Statics for 60 Years in the People's Republic of China) (Beijing: China's Statistics Press, 2010); National Bureau of Statistics, *Zhongguo Tongji Nianjian* (Statistical Year Book of China) (Beijing: China's Statistics Press, 1981-2023).

⁶² The trends (Figure 2) of GDP, urbanization rate and government revenue since the end of the Cultural Revolution echoed the official agenda of 'four moderations'. But the emphasis on fixed asset investment continued as was.

3. Preliminary observations and data

3.1. Preliminary observations

For preliminary analysis, we present two noticeable correlations between government officials' replacement and economic growth.

Table 5. Replacement of Officials and Economic Growth: Short-run Correlations

Dep. Var.	ln(<i>GDP</i>)		
	(1)	(2)	(3)
<i>ShareDeng_{p,t}</i>	0.009*** (0.003)	0.009*** (0.002)	0.003** (0.002)
Province FE	No	Yes	Yes
Year FE	No	No	Yes
MDV	23.688	23.688	23.688
Observations	180	180	180
Adjusted R^2	0.017	0.933	0.998

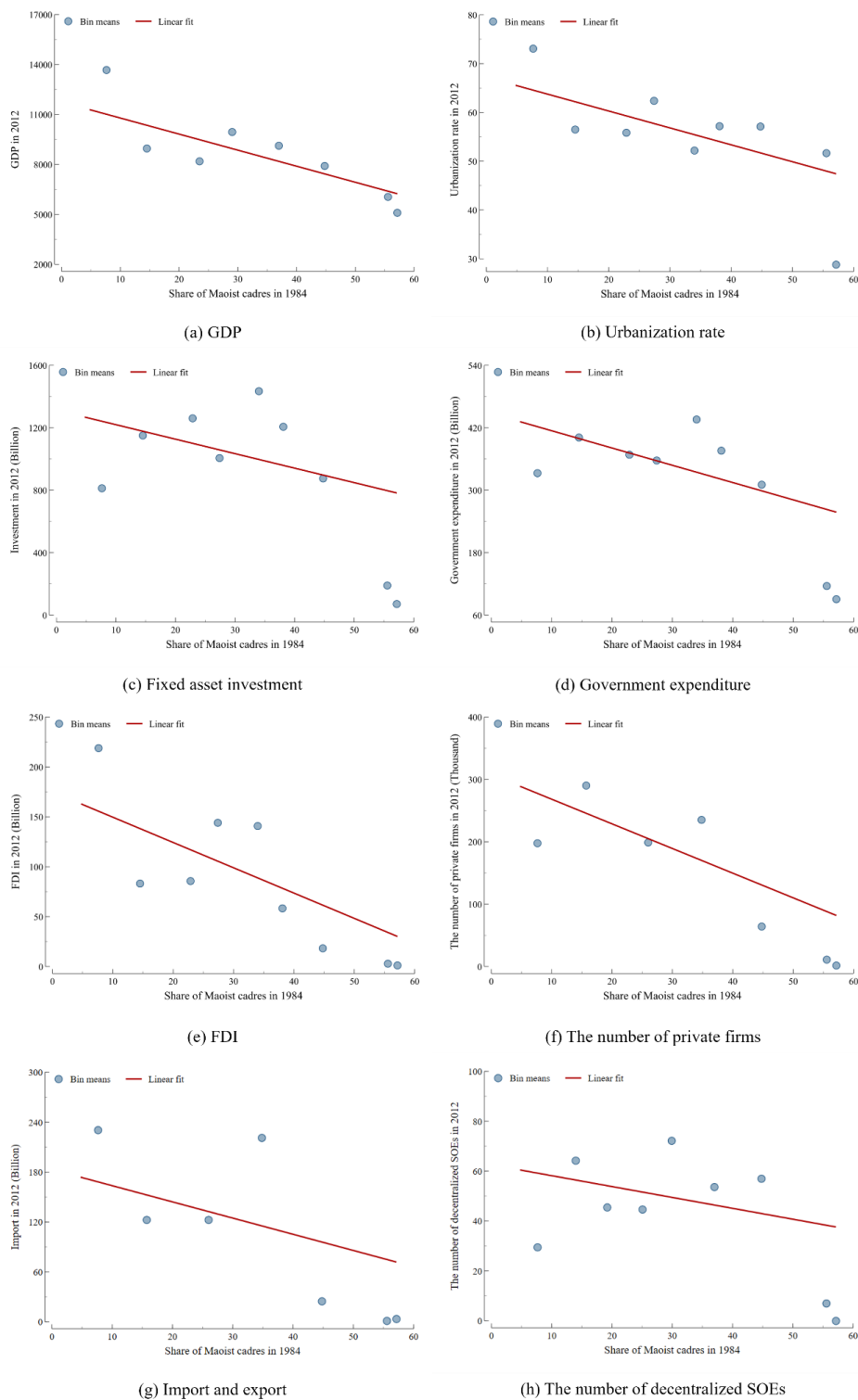
Note: Using province-year-level data, this table reports the correlation between the share of Deng's technocrats and economic growth. The specification follows: $\ln GDP_{p,t} = \alpha ShareDeng_{p,t} + \delta_p + \gamma_t + \varepsilon_{p,t}$, where p indexes provinces and t indexes year. $\ln GDP_{p,t}$ is logarithmic GDP. $ShareDeng_{p,t}$ denotes the share of newly promoted technocrats between 1982 and 1984. δ_p and γ_t denote province and year fixed effects respectively. $\varepsilon_{p,t}$ is the error term. The sample is restricted between 1982 (the beginning of the replacement scheme) and 1987 (the last year that COHD is available). We control for province fixed effects and year fixed effects. MDV= Mean of the dependent variable. Robust standard errors are in parentheses and are clustered at the province level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The first is the short run correlation (see Table 5) from the province-year panel data for 1982 and 1987 (due to data availability), which is regressed on logarithmic GDP against the share of newly promoted technocrats between 1982 and 1984. Column 1 of Table 5 shows estimates without controls. The share of Deng's newly promoted technocrats is positively correlated with GDP: One percent increase in technocrats is correlated to 0.9 percent increase in GDP. The estimates remain positive and significant with province effects (Column 2) and year fixed effect (Column 3). Our specification explains 99.8 percent of the variation in GDP (adjusted $R^2 = 0.998$). These results suggest that the government officials' replacement is likely to impact economic growth in the short run.

The second evidence pertains to long-run correlations. Figure 8 plots economic indicators in 2012 against the share of Maoist cadres in 1984 with a strong and

negative relationship with economic outcomes: GDP, urbanization rate, number of private firms, etc. Provinces with a higher number of Maoist cadres in power had a poor economic performance thirty years down the track after the replacement shock: Less foreign direct investment (FDI), less private sector growth, and weaker integration into the global economy.

Figure 8. Replacement of Officials and Economic Growth: Scatter Plots



Note: Using province-level data, this figure draws the correlation between the share of Maoist officials in 1984 (immediately after Deng's replacement shock) and economic outcomes in 2012 (i.e. 40 years after Deng's replacement shock). Economic outcomes include the GDP per capita (*yuan*), urbanization rate, fixed asset investment (in billion *yuan*), government expenditure (in billion *yuan*), foreign direct investment (in billion *yuan*), the number of private firms (x 1000), import+ export (in billion USD), and the number of decentralized SOEs.

Sources: Hao et al., *China's Organizational History Dataset*; National Bureau of Statistics, *60 Years of New China*; National Bureau of Statistics, *Statistical Year Book*.

3.2. Source data

For our purpose, we use the most recent digitalized dataset *China's Organizational History Dataset* (COHD) which covers the government officials' replacement of all provincial political leaders across all departments (i.e., military, party, government, and the consultative conference) up to 1987.⁶³ We supplement official information with *China Political Elite Database*.⁶⁴ For our purpose, we drop off unclear or missing officials from COHD and adjust administrative units to the current province level in China. Summary statistics are listed in Table 6.

Table 6. Summary Statistics

	N	Mean	S. D.
Government officials' replacement intensity	31	43.190*	6.996
GDP (Billion <i>yuan</i>)	2,200	586.184	1379.342
Government revenue (Billion <i>yuan</i>)	2,126	60.484	145.667
Government expenditure (Billion <i>yuan</i>)	2,193	109.048	234.843
Industrial output value (Billion <i>yuan</i>)	2,147	238.791	516.847
Urbanization rate	1,848	37.732	23.469
Average years of education	2,003	14.730	2.272
Share of officials with a bachelor's degree or above	2,003	69.404	21.923
Number of decentralized SOEs (x 1000)	2,200	0.014	0.028
Number of private industrial enterprises (x 1000)	1,989	9.704	45.424
Number of state-owned industrial enterprises (x 1000)	1,989	8.515	16.186
Village elections	2,166	0.504	0.500
Share of village elections	2,166	45.114	47.514

Note: * On average, 43.19 percent of Maoist officials were replaced in the 1982 replacement shock.⁶⁵

Source: Hao Chen, Saul Wilson, Changxin Patrick Xu, Cheng Cheng, and Yuhua Wang, *China's Organizational History Dataset*. First published in 2023; available online *vide*: <https://search.dataone.org/view/sha256:cf4bf78a46d725f9a9916180ce650a979f4e6cade2a4cc05f8491db46f79b332>. It contains the party personnel over time with a high level of consistency. Due to data availability, this study stops on the province level.

We take on board province-year level economic growth between 1950 and 2022, together with indicators for public service, industrial investment, and other

⁶³ Hao Chen, Saul Wilson, Changxin Patrick Xu, Cheng Cheng, and Yuhua Wang, *China's Organizational History Dataset*. First published in 2023; available online *vide*: <https://search.dataone.org/view/sha256:cf4bf78a46d725f9a9916180ce650a979f4e6cade2a4cc05f8491db46f79b332>.

⁶⁴ Junyan Jiang, *China Political Elite Database*. First published in 2018; available online *vide*: <https://www.junyanjiang.com/data.html>.

⁶⁵ Maoist officials refer to the ones promoted and still employed between the Cultural Revolution (1966) and Deng's replacement shock (1981).

relevant socio-economic outcomes. To construct these variables, we rely on two sources: (1) *60 Years of New China*, and (2) *China's Statistical Year Books*.⁶⁶ Recent studies have checked their reliability.⁶⁷

Other available preliminary data included those for SOE decentralization (*Annual Statistics for Industrial Firms*).⁶⁸ We aggregate the original firm-level data to construct province-level statistics for accumulated decentralization rate of SOEs as an important variable.

We also use 'Village Democracy Survey' (VDS) of the Ministry of Agriculture.⁶⁹ It contains data for elections held in 217 villages, which allows us to construct province-level data for pluralistic institutions on the grassroots level.

4. Empirical analysis

4.1. Identification strategy

Intuitively, to measure the impact of Deng's officials' replacement shock difference-in-differences (DiD) is well-suited. However, the conventional DiD with a discontinuous treatment is not applicable to our case. The alternative is a continuous treatment DiD strategy (i.e., the assignment of treatment is now continuous rather than discrete),⁷⁰ and hence our estimation Equation (1):

⁶⁶ National Bureau of Statistics, *Xin Zhongguo 60-Nian Tongji Ziliao Huibian (Compilation of Statics for 60 Years in the People's Republic of China)* (Beijing: China's Statistics Press, 2010); National Bureau of Statistics, *Zhongguo Tongji Nianjian (Statistical Year Book of China)* (Beijing: China's Statistics Press, 1981-2023).

⁶⁷ Anton Cheremukhin, Mikhail Golosov, Sergei Guriev, and Aleh Tsyvinski, 'The Political Development Cycle: The Right and the Left in People's Republic of China from 1953', *American Economic Review*, 114/4 (2024): 1107-1139; Gregory Chow, 'Are Chinese Official Statistics Reliable?' *CESifo Economic Studies*, 52/2 (2006): 396-414; Carsten A. Holz, "Fast, Clear and Accurate": How Reliable Are Chinese Output and Economic Growth Statistics? *China Quarterly*, 173 (2003): 122-63.

⁶⁸ Zhangkai Huang, Lixing Li, Guangrong Ma, Lixin C. Xu, 'Hayek, Local Information, and Commanding Heights: Decentralizing State-Owned Enterprises in China', *American Economic Review*, 107/8 (2017): 2455-2478. National Bureau of Statistics, *Zhongguo Gongye Jingji Tongji Nianjian (Annual Statistics for Industrial Firms)* (Beijing: China's Statistical Press, 1998-now).

⁶⁹ Monica Martinez-Bravo, Gerard P. Miquel, Nancy Qian, and Yang Yao, 'The Rise and Fall of Local Elections in China', *American Economic Review*, 112/9 (2022): 2921-2958.

⁷⁰ Nathan Nunn and Nancy Qian, 'The Potato's Contribution to Population and Urbanization: Evidence from a Historical Experiment', *Quarterly Journal of Economics*, 126/2 (2011): 593-650; Lisa D. Cook, Maggie Jones, Trevon Logan and David Rose, 'The Evolution of Access to Public Accommodations in the United States', *Quarterly Journal of Economics*, 138/1 (2023): 37-102.

$$Y_{p,t} = \beta Share_p \times Replace_t + \delta_p + \gamma_t + X_p \times \gamma_t + \varepsilon_{p,t} \quad (1)$$

Where p indexes provinces and t indexes time (year). $Y_{p,t}$ is the outcome variable (such as logarithmic GDP). To capture the magnitude of Deng's government officials' replacement on the provincial level, $Share_p$ is defined as: $100 \times (\text{Share of Maoist cadres in 1981} - \text{Share of Maoist cadres in 1984}) / \text{Share of Maoist officials in 1981}$, therefore between 0 and 100. $Replace_t$ is a dummy variable that equals one if the year is larger than or equal to 1984; otherwise, zero.

However, some underlying factors may affect simultaneously the implementation of government officials' replacement and future economic growth and cause bias in our estimates. To alleviate such concerns, Equation (1) includes province fixed effects (δ_p) and year fixed effects (γ_t). Province fixed effects control for all time invariant factors that differed between provinces. Year fixed effects control for any secular patterns of economic outcomes that affect all regions similarly. Also, Equation (1) includes a large set of province-specific pre-replacement characteristics interacted with year fixed effects ($X_p \times \gamma_t$). These include resource endowment, transportation cost, foreign trade, Maoist political legacy, human capital, urbanization, and climate. They are described in more details when introduced in the analysis.

The coefficient of interest β is the estimated impact of government officials' replacement on economic outcomes. For the sake of concreteness, we take logarithmic GDP as a dependent variable. The estimated $\hat{\beta}$ measures the additional growth in GDP in provinces where officials are replaced more aggressively (relative to those where are not) after 1984. A positive coefficient indicates that provinces with a more aggressive government officials' replacement had a greater increase in GDP after 1984.

Our continuous treatment DiD strategy has both advantages and pitfalls of standard DiD estimators. The identification relies on the assumption that there

are no other factors or events beyond what we control affecting the outcome variables and the treatment, that means conditional randomness of the treatment assignment. As this should not be taken for granted, we construct flexible empirical specification to lend support to the creditability of the assumption:

$$Y_{p,t} = \sum_{k=-4}^3 \beta_k \text{Share}_p \times D_{1984+10k} + \delta_p + \gamma_t + X_p \times \gamma_t + \varepsilon_{p,t} \quad (2)$$

Where all the variables are defined the same as in Equation (1). The only difference in Equation (2) is $\sum_{k=-4}^3 \beta_k \text{Share}_p \times D_{1984+10k}$ which represents a time span of 40 years before and after the replacement shock ($k = -4, -3, -2, -1, 0, 1, 2, 3$). $D_{1984+10k}$ equals one if year t is equal or greater than $1984 + 10k$ and less than $1984 + 10(k + 1)$; otherwise, zero. We leave $k = -1$ out so that all coefficients are measured with respect to the first decade before Deng's replacement shock. If there are no differential pre-trends in outcome variables from provinces with either a high or low replacement intensity, the coefficient estimates on the interaction terms in the pre-replacement period should not be statistically different from zero.

4.2. Baseline results

The results from Equation (1) are displayed in Table 7. Our specification includes province fixed effects, year fixed effects, and economic area-year fixed effects only (Column 1).⁷¹ The treatment effect of 0.013 can be interpreted as a 1.3 percent increase in GDP after one-percent increase in intensity in Deng's government officials' replacement shock.

⁷¹ The economic area-year fixed effects accounts for the province-year variation that is contributed by the geography of China. All provinces are divided into four economic areas, including Eastern China (Beijing, Tianjin, Hebei, Shandong, Jiangsu, Shanghai, Zhejiang, Fujian, Guangdong, and Hainan), Central China (Shanxi, Henan, Anhui, Hubei, Jiangxi, and Hunan), Western China (Chongqing, Sichuan, Yunnan, Guizhou, Guangxi, Tibet, Shaanxi, Gansu, Ningxia, Qinghai, Xinjiang, and Inner Mongolia), and Northeastern China (Liaoning, Jilin, and Heilongjiang).

Table 7. Replacement Shock and Economic Growth: DiD Estimates

Dep. Var.	ln(GDP)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$Share_p \times Replace_t$	0.013** (0.006)	0.017*** (0.005)	0.016*** (0.006)	0.018*** (0.005)	0.018** (0.007)	0.018** (0.007)	0.018** (0.009)
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Eco area×Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Transportation cost×Year	No	Yes	Yes	Yes	Yes	Yes	Yes
Foreign trade×Year	No	No	Yes	Yes	Yes	Yes	Yes
Maoist political legacy×Year	No	No	No	Yes	Yes	Yes	Yes
Human capital×Year	No	No	No	No	Yes	Yes	Yes
Urbanization×Year	No	No	No	No	No	Yes	Yes
Climate×Year	No	No	No	No	No	No	Yes
MDV	24.521	24.521	24.521	24.521	24.521	24.521	24.521
Observations	2,200	2,200	2,200	2,200	2,200	2,200	2,200
Adjusted R^2	0.996	0.996	0.997	0.997	0.997	0.997	0.998

Note: The dependent variable is logarithmic GDP. The independent variable is $Share_p \times Replace_t$. $Share_p$ is defined as (share of Maoist officials in 1981 – share of Maoist officials in 1984) / share of Maoist officials in 1981, which is the treatment intensity by provinces. Maoist officials here are the officials promoted to leadership positions between the Cultural Revolution and Deng’s replacement shock and still employed at that time. $Replace_t$ is a dummy variable that equals one if the year is larger than or equal to 1984; otherwise, zero. We control for province fixed effects, year fixed effects, and economic region × year fixed effects in all our specifications. Economic region is a set of dummy variables that equal one if the province belongs to any one of the four economic areas, including Eastern China (Beijing, Tianjin, Hebei, Shandong, Jiangsu, Shanghai, Zhejiang, Fujian, Guangdong, and Hainan), Central China (Shanxi, Henan, Anhui, Hubei, Jiangxi, and Hunan), Western China (Chongqing, Sichuan, Yunnan, Guizhou, Guangxi, Tibet, Shaanxi, Gansu, Ningxia, Qinghai, Xinjiang, and Inner Mongolia), and Northeastern China (Liaoning, Jilin, and Heilongjiang). We also control for transportation cost, foreign trade, Maoist political legacy, human capital before Deng’s replacement shock, urbanization before Deng’s replacement shock, and climate. Transportation cost is indexed by coastal area × year, and Yangtze area × year. Coastal area is a dummy variable that equals one if a province is adjacent to the sea. Yangtze area is a dummy variable that equals one if a province is in the Yangtze River Basin. Foreign trade is indexed by the total amount of import and export in 1981×year and the proportion of imports and exports in GDP in 1981 × year. Maoist political legacy is indexed by the number of political leaders in 1981 × year, the share of Maoist officials in 1981 × year, and the number of people’s communes in 1981×year. Human capital before Deng’s replacement shock is indexed by the number of university faculties in 1981 × year, the number of health institutions in 1981 × year, and the number of university enrollments in 1981 × year. Urbanization before Deng’s replacement shock is indexed by the urbanization rate in 1981 × year. Climate is indexed by the latitude × year. MDV = Mean of the dependent variable. Robust standard errors are in parentheses and are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1.

The validity of our continuous treatment DiD results depends on the assumption that the officials' replacement intensity is not determined by factors that could affect future economic growth. We substantiate it by directly controlling for observables that may be correlated with both government officials' replacement and future economic growth. So, controls are sequentially added on and results are displayed in Columns 2 to 7 of Table 7.

Column 2 shows the control for a set of dummy variables in terms of the Yangtze River Basin or China's east coast with time fixed effects to ensure that the roll-out replacement is not confounded by the geographical-determined transport, which has been argued by many to be an important factor for both national and international trade and economic prosperity.⁷²

In addition, total import and export and the proportion of foreign trade (imports and exports) in GDP in 1981 interact with time fixed effects in Column 3 to exclude the effects of initial trade condition with foreign partners. As China had just ended the Cultural Revolution (1966-76) at the time, we include the share of Maoist officials in 1981, and the number of people's communes in 1981, each interacted with time fixed effects, to index the initial political conditions (Column 4).

Meanwhile, human capital aligns with China's future economic strategy.⁷³ Therefore, we include the initial number of university faculties, number of health

⁷² Robert C. Allen, 'The Transportation Revolution and the English Coal Industry, 1695-1842: A Geographical Approach', *Journal of Economic History*, 83/4 (2023): 1175-1220; Sharat Ganapati and Woan Foong Wong, 'How Far Goods Travel: Global Transport and Supply Chains from 1965-2020', *Journal of Economic Perspectives*, 37/3 (2023): 3-30; Thanyaporn Chankrajang and Jessica Vechbanyongratana, 'Canals and Orchards: The Impact of Transport Network Access on Agricultural Productivity in Nineteenth-Century Bangkok', *Journal of Economic History*, 80/4 (2020): 996-1030; Giulia Brancaccio, Myrto Kalouptsi, and Theodore Papageorgiou, 'Geography, Transportation, and Endogenous Trade Costs', *Econometrica*, 88/2 (2020): 657-91; Michael Dunford, Weidong Liu, Zhigao Liu, and Godfrey Yeung, 'Geography, Trade and Regional Development: The Role of Wage Costs, Exchange Rates and Currency/Capital Movements', *Journal of Economic Geography*, 14/6 (2014): 1175-1197; Noel Maurer and Carlos Yu, 'What TR Took: The Economic Impact of the Panama Canal, 1903-1937', *Journal of Economic History*, 68/3 (2008): 686-721.

⁷³ Zheng Song, Kjetil Storesletten, and Fabrizio Zilibotti, 'Growing Like China', *American Economic Review*, 101/1 (2011): 196-233.

institutions, and number of university enrollments, all interacted with time fixed effects (Column 5).

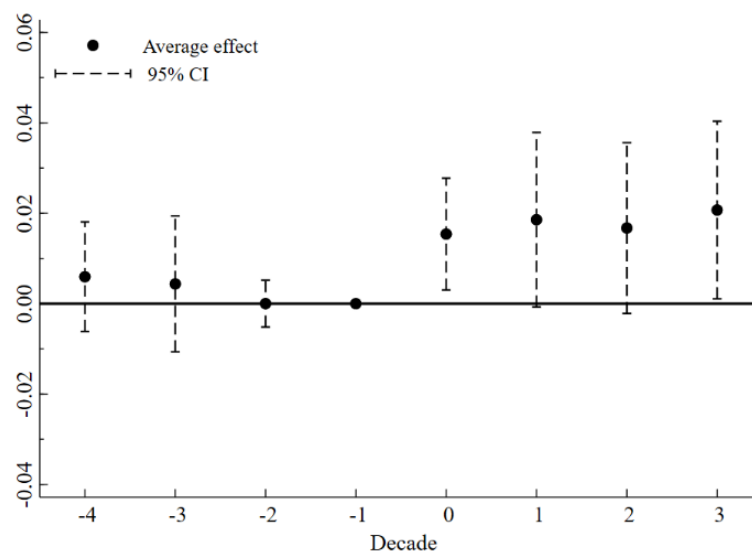
In addition, we include China's initial urbanization rate interacted with time fixed effects, as those places with low urbanization rate may have greater potential to grow. We also include the latitude (interacted with year fixed effects), which indexes aspects of climate and farming (e.g., temperature, precipitation, humidity, soil quality and disease).

With all these extra variables, our results change little at 5 percent level, fluctuating between 0.013 and 0.018. These results confirm that effects are dominated by the government officials' replacement rather than potential confounding factors.

4.3. Validity checks

Test for parallel trend assumption. The event study estimates are shown in Figure 7. Each of the point estimates represents a separate coefficient β_k from Equation (2). Our bands represent 95 percent confidence intervals.

Figure 7. Dynamic Effects of Officials' Replacement Shock on Economic Growth



We have two important results here. Firstly, we do not observe any trend of the estimated interaction effects during the time periods prior to the officials' replacement shock. This implies that our observed effects are unlikely to be driven by unobservable factors, conditional on those included observables. Secondly, economy growth is significant relative to provinces that have fewer officials replaced. Effects on GDP begin immediately after the replacement shock and continues nearly constant for the following four decades. Such a pattern not only shows the role of government officials' replacement on economic growth (including the long run), but also further justifies our DiD strategy.

Test for average treatment effect function assumption. An additional assumption here is that the 'average treatment effect function' dose changes little with treatment. So, low-dose units serve as the counterfactual outcome for high-dose units. Therefore, we assume that high-dose units have the identical treatment effects as the low-dose units in addition to untreated potential outcomes.⁷⁴ This is unlikely to be true if the dose itself (replacement intensity in our setting) is correlated with observables. Table A1 in Appendix shows the results of a balancing test for a large number of observables five years prior to the replacement scheme. Our coefficient estimates support such presumptions, showing little distinguish between the high- and low-density replacement provinces.

Test with alternative measures of economic growth. We substitute the dependent variable GDP with (1) logarithmic GDP and (2) GDP growth rate, and re-run Equation (1). Results are shown in Table A2 of Appendix. In terms of GDP per capita, one percent increase in the officials' replacement intensity leads to a 3.2 percent increase. These results verify estimated growth effects free from the arbitrary selection of outcome variables.

⁷⁴ Brantly Callaway, Andrew Goodman-Bacon, and Pedro H. C. Sant'Anna, 'Difference-in-differences with a Continuous Treatment', *National Bureau of Economic Research Working Paper*, No. 32117 (2024).

*Accounting for contemporary economic disparity.*⁷⁵ We tackle economic disparity with a standard DiD specification, with the replacement intensity above the median value as treated group and the rest as the control group.⁷⁶ Table A3 in Appendix shows that the estimates remain positive and significant across different combinations of controls, ranging from 0.240 to 0.380. To the minimal extent, treated group is 24 percent higher than the control group in terms of GDP relative to the control mean, with plausible pre-trends before the replacement shock.⁷⁷ Economically, by the end of 2022, the government officials' replacement shock in 1982 accounts for 18.05 percent ($2.245 \times 0.240 / [5.230 - 2.245]$) of the GDP difference between the treated (above-median intensity) and control (below-median intensity) groups.⁷⁸ Such a non-negligible size of effects suggests that the replacement shock sets the growth paths of two groups apart.

Alternative robust DiD estimators, regarding the interpretability of TWFE DiD estimator. This is attributed to the heterogeneity of treatment across groups. We adopt a set of robust DiD estimators.⁷⁹ Figure A3 of Appendix shows that estimates of these robust estimators remain valid which strengthened our main analysis.

*Falsification test of treatment intensity.*⁸⁰ If the observed effect can be easily replicated by randomly generated treatments, the effect is more likely confounded

⁷⁵ Paolo Abarcar and Caroline Theoharides, 'Medical Worker Migration and Origin-Country Human Capital: Evidence from US Visa Policy', *Review of Economics and Statistics*, 106/1 (2024): 20-35.

⁷⁶ Abarcar and Theoharides, 'Medical Worker Migration'.

⁷⁷ A separate pre-trend test for this standard DiD specification is conducted and the result is shown in Figure A2 in Appendix. The figure shows that there is no significant difference between the treated and control groups before the replacement shock.

⁷⁸ The average GDP for the treated (control) group is 5.230 (2.245) trillion *yuan*.

⁷⁹ Kirill Borusyak, Xavier Jaravel, and Jann Spiess, 'Revisiting Event-Study Designs: Robust and Efficient Estimation', *Review of Economic Studies*, (Feb. 2024): rdae007; Liyang Sun and Sarah Abraham, 'Estimating Dynamic Treatment Effects in Event Studies with Heterogeneous Treatment Effects', *Journal of Econometrics*, 225/2 (2021): 175-199; Brantly Callaway and Pedro H. C. Sant'Anna, 'Difference-in-differences with Multiple Time Periods', *Journal of Econometrics*, 225/2 (2021): 200-30.

⁸⁰ Pei Li, Yi Lu, and Jin Wang, 'Does Flattening Government Improve Economic Performance? Evidence from China', *Journal of Development Economics*, 123 (2016): 18-37; Eliana La Ferrara, Alberto Chong, and Suzanne Duryea, 'Soap Operas and Fertility: Evidence from Brazil', *American Economic Journal: Applied Economics*, 4/4 (2012): 1-31; Raj Chetty, Adam Looney, and Kory Kroft, 'Salience and Taxation: Theory and Evidence', *American Economic Review*, 99/4 (2009): 1145-1177.

by unobservables. We randomly generate the officials' replacement intensity for each province, re-estimate our benchmark model, and store the estimates. We repeat this exercise 500 times. The empirical density distribution is shown in Figure A4 of Appendix. The distribution of the estimated coefficients of the placebo treatment is centered around zero. Our benchmark estimate (0.018) lies outside of the range of coefficients in the simulation exercise. With these results, our findings are not spurious.

*Reliability of logarithm transformation.*⁸¹ An alternative approach is to use the IHS transformation,⁸² which accommodates responses along the intensive and extensive margins. Table A4 in Appendix contains estimates of Equation (1) with logarithmic GDP with the IHS-transformed GDP. The results are almost identical to those of log transformation, suggesting that this statistical issue is unlikely to be an issue in our setting.

Sensitivity check to the choice of baseline year. We use 1981 (one year prior to the replacement shock) as the baseline year for calculating treatment intensity. Given that the selection of the baseline year could influence the final estimates, we reset the baseline year once every five years preceding the replacement shock and then re-run Equation (1). The estimates remain significant and consistently around 0.18, indicating that our analysis is robust to the choice of the baseline year (Figure A5 in Appendix).

5. Mechanisms

This study envisage growth in GDP was a result of state capacity despite the fact that logically property rights, taxation, publica goods provision, and so on should be mentioned first.⁸³

⁸¹ Jiafeng Chen and Jonathan Roth, 'Logs with Zeros? Some Problems and Solutions', *Quarterly Journal of Economics*, 139/2 (2024): 891-936.

⁸² Xiaomeng Cui and Qu Tang, 'Extreme Heat and Rural Household Adaptation: Evidence from Northeast China', *Journal of Development Economics*, 167 (2024): 103243.

⁸³ E.g. Cheibub, 'Political Regimes'; Besley and Persson, 'Origins of State Capacity'; Johnson and Koyama, 'Tax Farming'; Queralt, 'From Mercantilism to Free Trade'; Johnson and Koyama, 'States and Economic Growth'.

Although Deng's government officials' replacement shock was one-off, our evidence indicates that its growth effects are both noticeable and persistent. But why? Possibilities include a change in bureaucrats' quality leading to (1) reconstruction of state capacity to raise income and provide public goods, (2) deregulation of the Maoist *extra-economic coercion* in favour of the market, and (3) emergence of pluralistic institutions.

5.1. Reshaping the government with improved human capital

As a change in the human capital of government officials is an important factor,⁸⁴ we testify the first-order effects of Deng's laying off Maoist revolutionary cadres, and then examine its corresponding effects on the education of incumbent officials.

On average, one percent more in the officials' replacement intensity decreases the size of state by 2.9 percent. While remaining negative, the estimates are significant only for Maoist cadres rather than any other cohort, with larger magnitude (4.1 vs 1.3 percent). Back to the 1981 benchmark, with a one-percent increase in replacement magnitude, there appears a total decrease of 15.203 ($=0.029 \times 524.233$) in officials. This includes of a 11.701 ($=0.041 \times 285.4$) decrease in Maoist cadres and 3.105 ($=0.013 \times 238.833$) decrease in other cohorts, with a negligible 0.397 noise. In other words, the laying off of Maoist cadres dominates the 'streamlining' process by accounting for nearly 80 percent ($=11.701/15.203$) of the total effects. This is what Deng and his fellow reformer eventually achieved.

⁸⁴ Ying Bai, Ruixue Jia, and Jiaojiao Yang, 'Web of Power: How Elite Networks Shaped War and Politics in China', *Quarterly Journal of Economics*, 138/2 (2023): 1067-1108; Peng Wang and Xia Yan, 'Bureaucratic Slack in China: The Anti-Corruption Campaign and the Decline of Patronage Networks in Developing Local Economies', *China Quarterly*, 243 (2020): 611-34; Junyan Jiang, 'Making Bureaucracy Work: Patronage Networks, Performance Incentives, and Economic Development in China', *American Journal of Political Science*, 62/4 (2018): 982-99. More specifically, Jiang, 'Making Bureaucracy Work'; and Wang and Yan, 'Bureaucratic Slack in China' focus on patronage-client relations to solve the principal-agent problem. Bai et al. 'Web of Power' highlights the role of elite's personal network in shaping political and social economy.

Table 8. Reorganizing Government

Dep. Var.	ln(<i>Total number of officials of certain cohorts</i>)		
	(1)	(2)	(3)
	All cohorts	Maoist cadres	Other cohorts
$Share_p \times Replace_t$	-0.029** (0.013)	-0.041** (0.020)	-0.013 (0.011)
Controls	Yes	Yes	Yes
MDV	5.682	4.762	5.266
MAVDV in 1981	524.233	285.400	238.833
Observations	1,136	660	1,136
Adjusted R^2	0.969	0.954	0.970

Note: Using province-year-level data, this table reports the effects of Deng's government officials' replacement on the reorganization of the government. The dependent variable is the logarithmic total number of officials of certain cohorts. Column 1 is for all cohorts. Column 2 is for Maoist cadres. Column 3 is for other cohorts. The definition of Maoist cadres follows Footnote 7. Controls include province fixed effects, year fixed effects, economic region $\times$ year fixed effects, transportation cost, foreign trade, Maoist political legacy, human capital before Deng's replacement, urbanization before Deng's replacement, and climate. MDV = Mean of the dependent variable. MAVDV = Mean of absolute value of dependent variable. Robust standard errors are in parentheses and are clustered at the province level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Next, we examine the potential effects on officials' education by replacing the outcome variable with years of schooling and the share of officials with a bachelor's degree or above, and re-estimating Equation (1). Table 9 shows that one percent more in the officials' replacement intensity increases the average years of schooling by 0.082 years (0.5 percent), and an increase in the share of officials with a bachelor's degree or above by 1.049 percent (1.51 percent). These effects are more obvious on officials above the mid-rank (bureau) level, with estimates being 0.194 years (1.28 percent) on years of schooling and 2.486 percentage points (3.54 percent) on the share of officials with bachelor's degree or above, respectively.

Table 9. Officials' Replacement and Selection

Dep. Var.	Average years of schooling		Share of officials with bachelor's degree or above	
	(1) All ranks	(2) Above the bureau level	(3) All ranks	(4) Above the bureau level
$Share_p \times Replace_t$	0.082** (0.033)	0.194** (0.086)	1.049** (0.417)	2.486** (1.116)
Controls	Yes	Yes	Yes	Yes
MDV	14.73	15.11	69.404	70.272
Observations	2,003	2,003	2,003	2,003
Adjusted R^2	0.893	0.911	0.837	0.899

Note: Using province-year-level data, this table reports the effects of Deng's government officials' replacement on official selection. The dependent variable is the average years of schooling in Columns 1 and 2, and the share of officials with bachelor's degree or above. Controls include province fixed effects, year fixed effects, economic region $\times$ year fixed effects, transportation cost, foreign trade, Maoist political legacy, human capital before Deng's replacement, urbanization before Deng's replacement, and climate. MDV = Mean of the dependent variable. Robust standard errors are in parentheses and are clustered at the province level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5.2. Improvements in fiscal capability: taxation and public goods

With large number of Maoist cadres replaced by Deng's technocrats, the impacts on the state fiscal capacity seems straightforward. We use two variables to test this: government revenue per thousand-yuan GDP and government revenue.

The results are reported in Table 10. We observe an increase not only in government total revenue, but more importantly, in government revenue per unit of GDP. One percent increase in the officials' replacement intensity rises government revenue per-thousand yuan GDP by 0.495 yuan (0.4 percent) and the total government revenue by 6.3 percent. Although an enlarged government revenue may be driven by economies of scale, the increase in revenue per unit of GDP undoubtedly implies an increase in government efficiency in tax collection.⁸⁵

⁸⁵ Certainly, an increase in tax revenue may come from a higher tax rate. But this is unlikely to be the case of Deng's China: (1) Tax rate was set by the central government and applicable to all provinces; (2) this common trend is excluded, as our identification strategy exploits the difference of outcome variable across year and province. Hence, even if there are some increases in the tax rate during the sample period, it will not enter our estimates.

Table 10. Officials' Replacement and Fiscal Capability

Dep. Var.	(1) <i>Government revenue per thousand- yuan GDP</i>	(2) <i>ln(Government revenue)</i>
$Share_p$	0.495**	0.063**
$\times Replace_t$	(0.247)	(0.025)
Controls	Yes	Yes
MDV	137.821	22.406
Observations	2,099	2,126
Adjusted R^2	0.650	0.972

Note: Using province-year-level data, this table reports the effects of Deng's government officials' replacement on fiscal capability. The dependent variable is government revenue per thousand-yuan GDP in Column 1, and logarithmic total government revenue in Column 2. Controls include province fixed effects, year fixed effects, economic region $\times$ year fixed effects, transportation cost, foreign trade, Maoist political legacy, human capital before Deng's replacement shock, urbanization before Deng's replacement shock, and climate. MDV = Mean of the dependent variable. Robust standard errors are in parentheses and are clustered at the province level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

But by definition increased government revenue does not necessarily translate into public service. The extra revenue may be reinvested, or simply used to pay officials higher salaries. Evidently, however, a significant increase on the spending of public services can be detected by employing government expenditure (on various categories) as outcome variables. As shown in Table 11, one percent increase in the officials' replacement intensity is associated with 3.1 percent increase in total government expenditure, and 4.6 percent increase in agriculture, 4.3 percent increase in education, and 2.9 percent increase in other services. These estimates are all significant at the 5 percent level (even at 1 percent level). They further suggest that, unlike the previous Maoist counterpart who practiced coercing the private and investing overwhelmingly in heavy industry,⁸⁶ the post-Mao reformist government had a balanced attitude and pay more attention to public goods provision.

⁸⁶ Cheremukhin, et al., 'Political Development Cycle'; Jim H. Shen, Jingyuan Guo and Kent Deng, 'Mechanisms and Performance of the Maoist Economy: A Holistic Approach, 1950-1980', *Journal of the Economic and Social History of the Orient*, 4/67 (2024): 646-701.

Table 11. Officials' Replacement and Public Goods Provision

Dep. Var.	ln(<i>Government expenditure</i>)			
	(1) Total	(2) Agriculture	(3) Education	(4) Other services
$Share_p \times Replace_t$	0.031** (0.012)	0.046*** (0.004)	0.043*** (0.013)	0.029** (0.013)
Controls	Yes	Yes	Yes	Yes
MDV	22.596	20.263	21.022	22.247
Observations	2,193	2,002	2,131	2,124
Adjusted R^2	0.993	0.988	0.990	0.992

Note: Using province-year-level data, this table reports the effects of Deng's government officials' replacement on state capability. The dependent variable is logarithmic total government expenditure in Column 1, logarithmic government expenditure in agricultural infrastructure in Column 2, logarithmic government expenditure in education in Column 3, and logarithmic government expenditure in public service in Column 4. Controls include province fixed effects, year fixed effects, economic region $\times$ year fixed effects, transportation cost, foreign trade, Maoist political legacy, human capital before Deng's replacement shock, urbanization before Deng's replacement shock, and climate. MDV = Mean of the dependent variable. Robust standard errors are in parentheses and are clustered at the province level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5.3. Market-friendly industrialization: Deregulating Maoist *extra-economic coercion* and facilitating the private sector

One pivotal distinction between Maoist cadres and Deng's technocrats lies in their attitudes towards the market. For deregulation of Maoist *extra-economic coercion*, we use decentralization of SOEs as a proxy, along with the number of industrial enterprises, industrial output value and urbanization rate.⁸⁷

Table 12 shows that provinces with more Deng's officials decentralize SOEs further. With one percent increase in the officials' replacement intensity, the number of decentralized SOEs increases by 4.1 percent. Consistently, growth effects on the number of private industrial enterprises are greater than state-owned enterprises (Columns 2 and 3). As a result, the industrial output value increases by 4.5 percent and urbanization rate increases by 1.7 percentage points (4.5 percent), respectively with one percent increase in the officials' replacement intensity.

⁸⁷ Huang, et al., 'Hayek, Local Information, and Commanding Heights'.

Table 12. Government Officials' Replacement and Market-Friendly Industrialization

Dep. Var.	$\ln(\text{Number of decentralized SOEs})$	$\ln(\text{Number of industrial enterprises})$		$\ln(\text{Industrial output value})$	Urbanization rate
	(1)	(2)	(3)	(4)	(5)
		Private	State-owned		
$\text{Share}_p \times \text{Replace}_t$	0.041*** (0.007)	0.101** (0.041)	0.017 (0.012)	0.045** (0.020)	1.701*** (0.435)
Controls	Yes	Yes	Yes	Yes	Yes
MDV	1.117	5.046	7.942	24.034	37.732
Observations	2,200	1,989	1,989	2,147	1,848
Adjusted R^2	0.973	0.968	0.985	0.995	0.980

Note: Using province-year-level data, this table reports the effects of Deng's government officials' replacement of on pro-market modernization. The dependent variable is logarithmic the number of decentralized SOEs in Column 1, logarithmic the number of private industrial firms in Column 2, logarithmic the number of state-owned industrial firms in Column 3, logarithmic industrial output value in Column 4, and the urbanization rate in Column 5. Controls include province fixed effects, year fixed effects, economic region $\times$ year fixed effects, transportation cost, foreign trade, Maoist political legacy, human capital before Deng's replacement shock, urbanization before Deng's replacement shock, and climate. MDV = Mean of the dependent variable. Robust standard errors are in parentheses and are clustered at the province level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5.4. Pluralistic institutions at the village level

We next examine whether Deng's technocrats are more likely to implement pluralistic institutions.⁸⁸ We replace the outcome variable with a village elections variable and re-run Equation (1). The results are displayed in Table 13.

Table 13. Officials' Replacement and Village Elections

Dep. Var.	(1) <i>Whether a province introduces village elections</i>	(2) <i>Share of villages implementing elections</i>
$Share_p \times Replace_t$	0.016*** (0.002)	1.238*** (0.244)
Controls	Yes	Yes
MDV	0.510	45.603
Observations	2,166	2,166
Adjusted R^2	0.953	0.957

Note: Using province-year-level data, this table reports the effects of Deng's government officials' replacement on grassroots elections. The dependent variable is a dummy variable that equals one if the province implements village elections (Column 1), and the share of villages implementing elections (Column 2). Controls include province fixed effects, year fixed effects, economic region $\times$ year fixed effects, transportation cost, foreign trade, Maoist political legacy, human capital before Deng's replacement shock, urbanization before Deng's replacement shock, and climate. MDV = Mean of the dependent variable. Robust standard errors are in parentheses and are clustered at the province level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

On average, provinces with one percent more in the officials' replacement intensity are 1.6 percentage points (3.1 percent) more likely to introduce village elections, and increase the share of villages implementing elections by 1.238 percentage points (2.71 percent). This may contribute to more economic freedom.⁸⁹

6. Conclusions

To conclude, the present research unveils the secret of China's economic performance in the post Mao era under the new leadership of Deng Xiaoping who faced two seemingly incompatible missions: to bail China out of a deeply seated economic crisis but maintain the part-state rule at the same time. This was a mammoth task closely related to state capacity and its rebuilding.

⁸⁸ Martinez-Bravo, et al., 'Local Elections'.

⁸⁹ Acemoglu and Robinson. *Why Nations Fail*; Acemoglu, Johnson, and Robinson, 'Colonial Origins'.

What Deng's reforms managed to achieve was to open the flood gate of the bureaucracy in 1982-84, letting better educated technocrats replace Mao's revolutionary old guards, all in the name of a better material life for everyone in the country. This seemingly a common-sense approach rescued China's state capacity and economy both being systematically and severely damaged by Maoism. Our findings are confirmed quantitatively by a range of socio-economic indicators.

Beyond China's borders, our findings suggest that the reformation of official structures - especially in developing and transitional economies- can serve as a catalyst for broader socio-economic changes. By systematically replacing outdated or ineffective officials with more capable, educated technocrats, governments may enhance their state capacity, improve policy implementation, and promote the market. In short, it is one magic stone to kill multiple birds.

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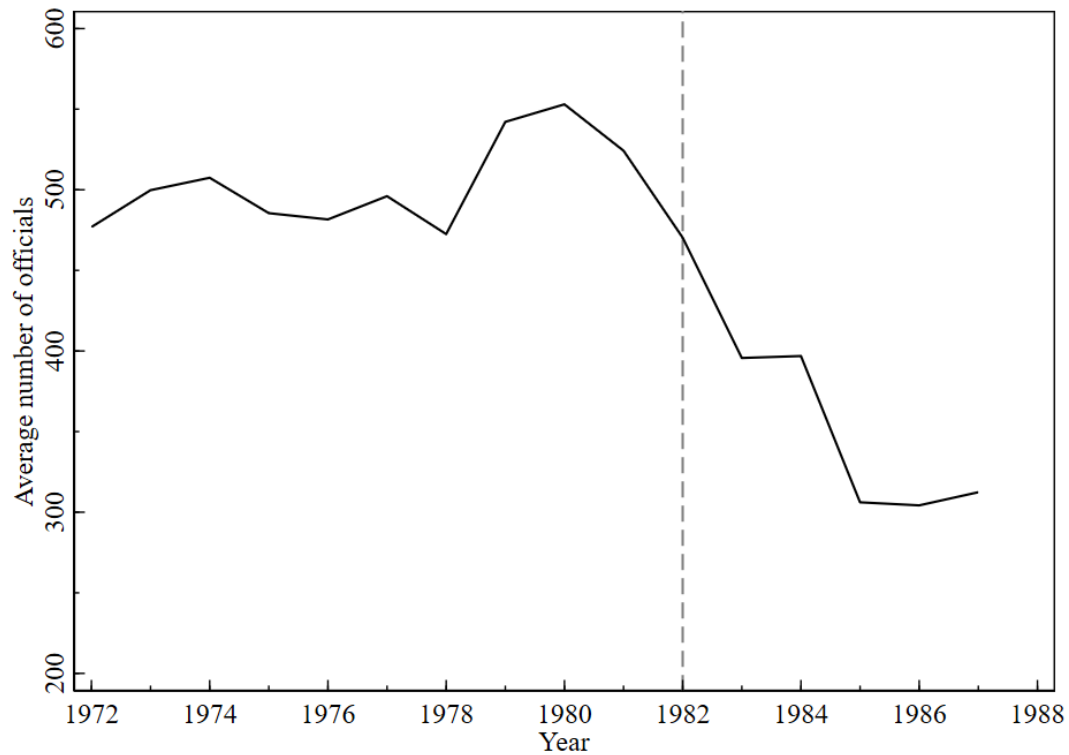
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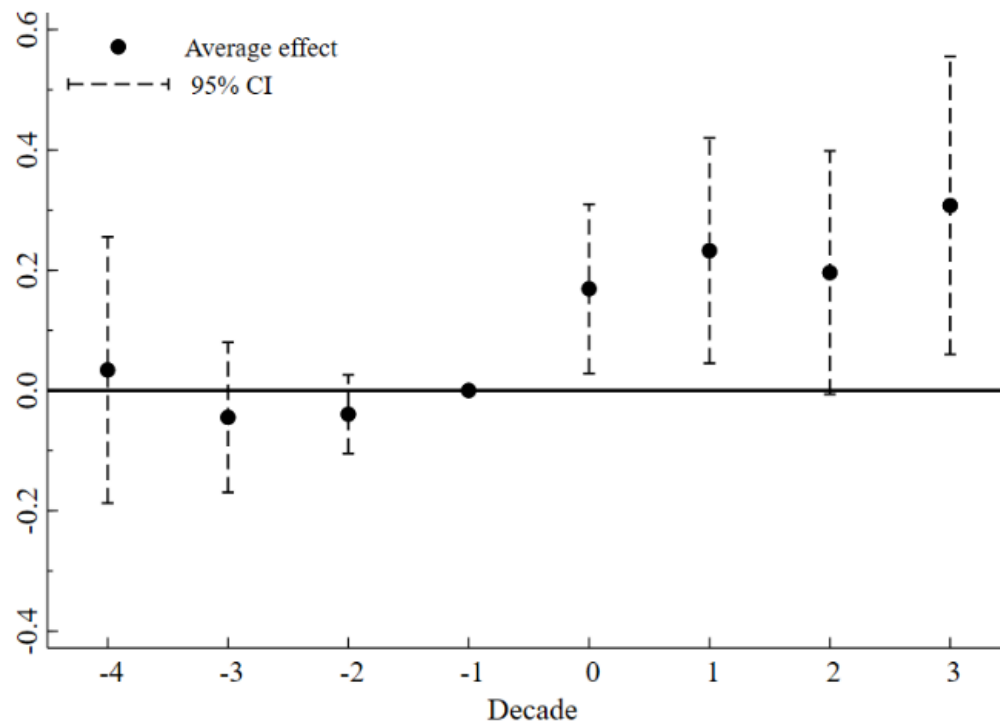
Appendix

Figure A1. Laying Off Maoist Cadres through Streamlining Government Departments



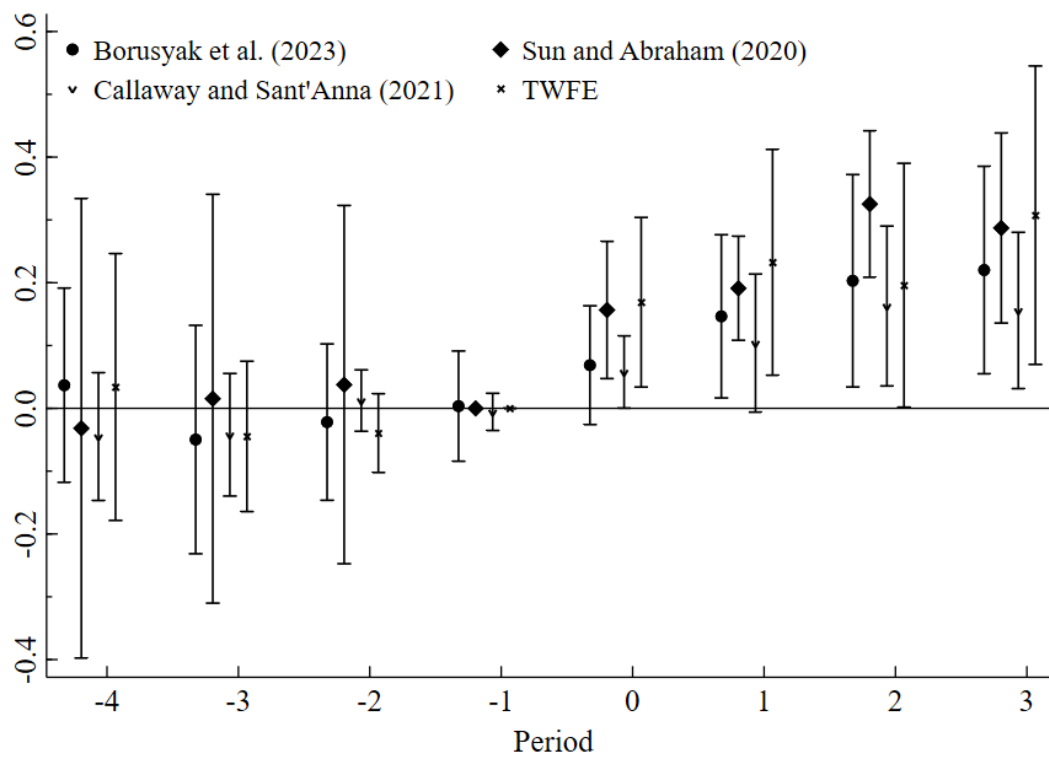
Source: Hao Chen, Saul Wilson, Changxin Patrick Xu, Cheng Cheng, and Yuhua Wang, *China's Organizational History Dataset*. First published in 2023; available on 1st October, 2024; online *vide*: <https://search.dataone.org/view/sha256:cf4bf78a46d725f9a9916180ce650a979f4e6cade2a4cc05f8491db46f79b332>.

Figure A2. Dynamic Effects of Government Officials' Replacement and Economic Growth: Standard DiD Estimates



Note: This figure presents the dynamic estimates of the standard DiD specification.

Figure A3. Alternative Robust DiD Estimators



Note together with sources: Kirill Borusyak, Xavier Jaravel, and Jann Spiess, 'Revisiting Event-Study Designs: Robust and Efficient Estimation', *Review of Economic Studies*, (Feb. 2024): rdae007; Liyang Sun and Sarah Abraham, 'Estimating Dynamic Treatment Effects in Event Studies with Heterogeneous Treatment Effects', *Journal of Econometrics*, 225/2 (2021): 175-99; Brantly Callaway and Pedro H. C. Sant'Anna, 'Difference-in-differences with Multiple Time Periods', *Journal of Econometrics*, 225/2 (2021): 200-30.

Figure A4. Falsification Test

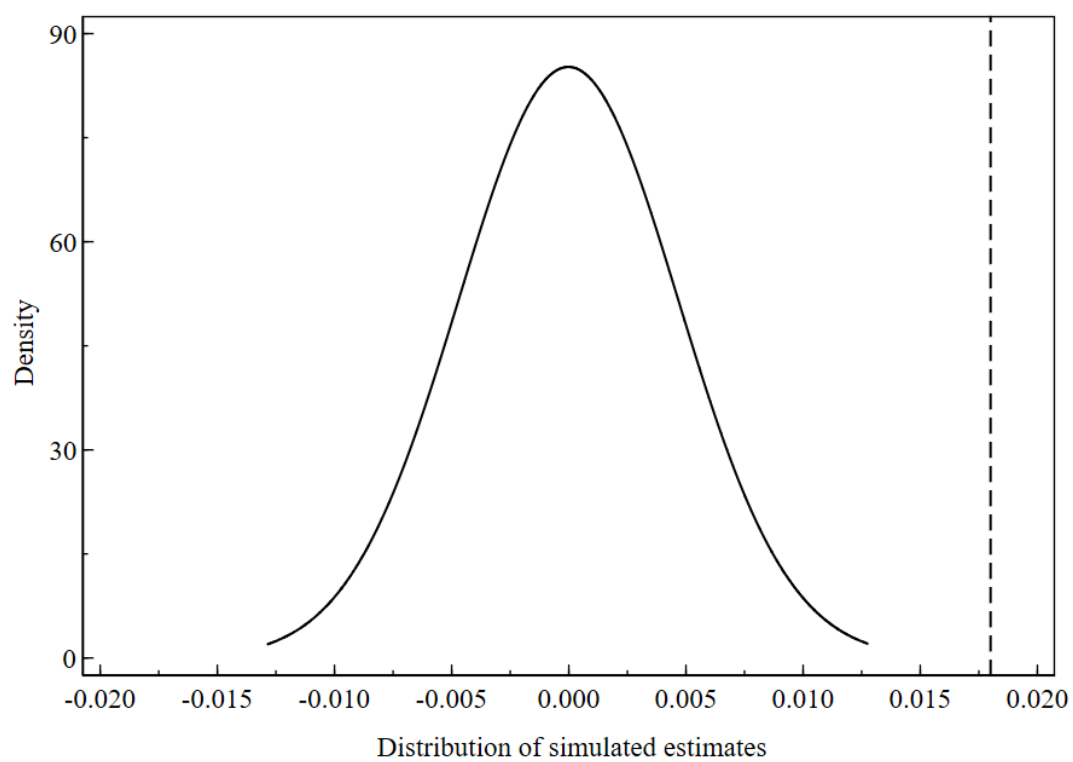


Figure A5. Sensitivity Test

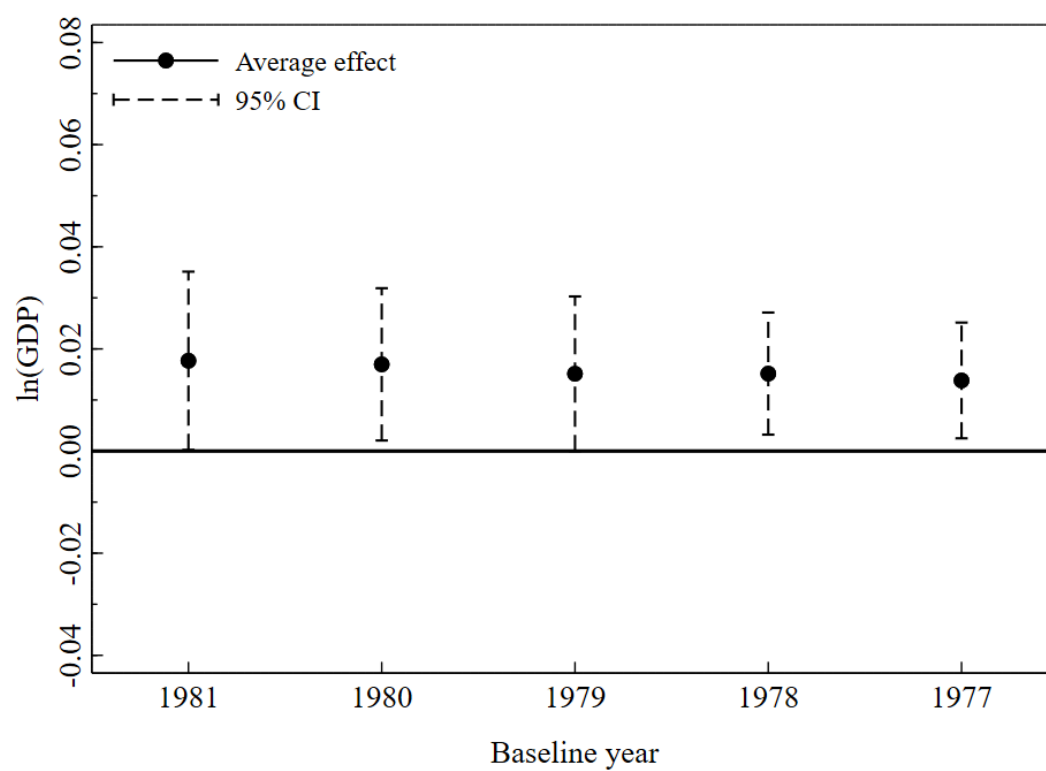


Table A1. Determinants of Government Officials' Replacement Intensity

Dep. Var.	<i>Replacement intensity</i>				
	(1)	(2)	(3)	(4)	(5)
Sample year	1981	1980	1979	1978	1977
$\ln(GDP)$	-13.727 (10.428)	-11.750 (8.461)	-17.439* (8.740)	-4.769 (9.284)	-8.644 (8.212)
<i>GDP share of secondary industry</i>	-0.998 (17.134)	7.572 (18.174)	14.215 (15.959)	8.363 (17.335)	-7.862 (23.915)
$\ln(Import+ export)$	2.841 (2.437)	2.079 (1.893)	1.975 (2.083)	1.149 (1.856)	1.455 (2.350)
<i>Urbanization rate</i>	0.002 (0.065)	-0.002 (0.072)	-0.015 (0.081)	-0.029 (0.069)	-0.049 (0.104)
$\ln(Number\ of\ university\ faculties)$	-9.638 (9.087)	-8.344 (9.978)	-11.832 (11.167)	5.586 (9.747)	5.782 (10.197)
$\ln(Number\ of\ health\ institutions)$	14.979 (9.362)	14.291* (8.297)	14.544* (8.196)	12.214 (7.656)	11.531 (7.156)
$\ln(Number\ of\ university\ enrollments)$	12.101 (10.405)	8.987 (11.585)	18.130 (14.435)	-8.284 (15.524)	-6.781 (17.432)
MDV	43.190	43.190	43.190	43.190	43.190
Observations	30	30	30	30	30
Adjusted R^2	0.309	0.296	0.365	0.256	0.367

Note: Using province-level data, this table examines the determinants of government officials' replacement intensity. MDV = Mean of the dependent variable. Robust standard errors are in parentheses and are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1.

Table A2. Alternative Measures of Economic Growth

Dep. Var.	(1) ln(<i>GDP</i>)	(2) ln(<i>GDP per capita</i>)	(3) <i>GDP growth rate</i>
$Share_p \times Replace_t$	0.018** (0.009)	0.032** (0.005)	0.051** (0.010)
Controls	Yes	Yes	Yes
MDV	24.521	7.435	8.558
Observations	2,200	2,198	2,167
Adjusted R^2	0.998	0.990	0.823

Note: Using province-year-level data, this table reports the effects of Deng's government officials' replacement on pro-market industrialization. The dependent variable is logarithmic GDP in Column 1, logarithmic GDP per capita in Column 2, and GDP growth rate in Column 3. Controls include province fixed effects, year fixed effects, economic region $\times$ year fixed effects, transportation cost, foreign trade, Maoist political legacy, human capital before Deng's replacement shock, urbanization before Deng's replacement shock, and climate. MDV= Mean of the dependent variable. Robust standard errors are in parentheses and are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1.

Table A3. Officials' Replacement and Economic Growth: Standard DiD Estimates

Dep. Var.	ln(<i>GDP</i>)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>ReplaceD_{p,t}</i>	0.240** (0.096)	0.380*** (0.105)	0.326** (0.130)	0.322** (0.126)	0.326** (0.151)	0.336** (0.150)	0.346** (0.162)
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Eco area×Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Transportation cost×Year	No	Yes	Yes	Yes	Yes	Yes	Yes
Foreign trade×Year	No	No	Yes	Yes	Yes	Yes	Yes
Maoist political legacy×Year	No	No	No	Yes	Yes	Yes	Yes
Human capital×Year	No	No	No	No	Yes	Yes	Yes
Urbanization×Year	No	No	No	No	No	Yes	Yes
Climate×Year	No	No	No	No	No	No	Yes
MDV	24.521	24.521	24.521	24.521	24.521	24.521	24.521
Observations	2,200	2,200	2,200	2,200	2,200	2,200	2,200
Adjusted <i>R</i> ²	0.996	0.996	0.997	0.997	0.997	0.997	0.998

Note: Using province-year-level data, this table reports the effects of Deng's government officials' replacement on economic growth. The dependent variable is logarithmic GDP. The independent variable is *ReplaceD_{p,t}*. *ReplaceD_{p,t}* is a dummy variable that equals one if the province is above the median of treatment intensity, and the year is larger than or equal to 1984; otherwise, zero. We control for province fixed effects, year fixed effects, and economic region × year fixed effects in all our specifications. Economic region is a set of dummy variables that equal one if the province belongs to any one of the four economic areas, including Eastern China (Beijing, Tianjin, Hebei, Shandong, Jiangsu, Shanghai, Zhejiang, Fujian, Guangdong, and Hainan), Central China (Shanxi, Henan, Anhui, Hubei, Jiangxi, and Hunan), Western China (Chongqing, Sichuan, Yunnan, Guizhou, Guangxi, Tibet, Shaanxi, Gansu, Ningxia, Qinghai, Xinjiang, and Inner Mongolia), and Northeastern China (Liaoning, Jilin, and Heilongjiang). We also control for transportation cost, foreign trade, Maoist political legacy, human capital before Deng's replacement shock, urbanization before Deng's replacement shock, and climate. Transportation cost is indexed by coastal area × year, and Yangtze area × year. Coastal area is a dummy variable that equals one if a province is adjacent to the sea. The Yangtze Region is a dummy variable that equals one if a province is in the Yangtze River Basin. Foreign trade is indexed by the total value of import and export in 1981 × year and the proportion of import and export in GDP in 1981 × year. Maoist political legacy is indexed by the number of political leaders in 1981 × year, the share of Maoist officials in 1981 × year, and the number of people's communes in 1981 × year. Human capital before Deng's replacement shock is indexed by the number of university faculties in 1981 × year, the number of health institutions in 1981 × year, and the number of university enrollments in 1981 × year. Urbanization before Deng's replacement shock is indexed by the urbanization rate in 1981 × year. Climate is indexed by the latitude × year. MDV = Mean of the dependent variable. Robust standard errors are in parentheses and are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1.

Table A4. IHS Transformation

Dep. Var.	(1) $\ln(GDP)$	(2) $\text{Asinh}(GDP)$
$Share_p \times Replace_t$	0.018** (0.009)	0.018** (0.009)
Controls	Yes	Yes
MDV	24.521	24.521
Observations	2,200	2,200
Adjusted R^2	0.998	0.998

Note: Using province-year-level data, this table reports the effects of Deng's government officials' replacement on pro-market industrialization. The dependent variable is logarithmic GDP in Column 1, and the IHS of GDP in Column 2. Controls include province fixed effects, year fixed effects, economic region $\times$ year fixed effects, transportation cost, foreign trade, Maoist political legacy, human capital before Deng's replacement shock, urbanization before Deng's replacement shock, and climate. MDV = Mean of the dependent variable. Robust standard errors are in parentheses and are clustered at the province level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.