Unintended Family Planning Legacy on Intergenerational Mobility[1]

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Abstract

This paper examines the impact of China's family planning policies—the "later-longer-fewer" campaign and the one-child policy—on intergenerational mobility. Using a dataset of 2,096,978 child-parent pairs and leveraging regional variations in fines and political costs for policy violations, we find that provinces with higher fine rates and political costs exhibit higher mobility in income, education, and social class. These results are robust to a variety of checks, including the use of provincial secretaries and governors' ages as instruments. Mobility gains are primarily driven by upward movement among children from families in the bottom 40% of the income, education, and social class distribution and downward movement among top-quintile families. We also observe that fines disproportionately reduce fertility among lower-income families, while political costs more effectively target political elites. However, differential fertility alone does not fully explain the mobility gains, as we do not find significant difference in mobility emerges between elite and non-elite families. Our analysis identifies two key mechanisms driving these outcomes: resource concentration among lower-income families and elite succession attenuation.

Keywords: Family planning, intergenerational mobility, rank persistence, upward rank mobility

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Do those gentry certainly have blue blood?
—A well-known uprising slogan by Chen Sheng in 209 B.C.,
recorded in *Historical Records, the Hereditary House of Chen She*[4]

"The greatest regret in my life is that if I could have a second child... but I absolutely cannot ...because my father (was) a leader of the country."
— Li Xiaolin, daughter of former Premier Li Peng. 2013.[5]

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1. Introduction

Understanding the drivers of intergenerational mobility is central to assessing socioeconomic fairness. Intergenerational mobility reflects the degree to which an individual's life opportunities are determined by their family background. Higher mobility reflects a more equitable society, while persistent low mobility entrenches social classes and limits opportunities (Chetty et al., 2014; Lipset and Bendix, 2018; Bell et al., 2019). Traditional policies to enhance mobility, such as improving education, housing, and parental wealth equality, focus on equalizing opportunities for future generations (Pfeffer, 2011; Jackson, Johnson, and Persico, 2016; Chetty and Hendren, 2018a, 2018b). But these interventions are often small in scale and lack long-term evidence of their effectiveness.

A potentially more direct approach to changing mobility is family planning, which can shape children's life chances from birth by influencing family size and resource allocation. Family planning policies have been widely implemented across the world. By 2019, 69 of 197 countries had policies aimed at reducing fertility, 55 sought to increase fertility, and 19 aimed to maintain current levels (United Nations, 2021). Previously, in the 1970s, the U.S. congress passed family planning act (Title X), and other countries and regions such as Iran, Hong Kong, Singapore, and Vietnam adopted two-child policies, providing subsidies only for the first two children within a family.[6] Recent policy shifts, such as tighter abortion restrictions in Poland, Hungary, and El Salvador, liberalizations in Ireland and Argentina, and the 2022 reversal of Roe v. Wade in the United States, which resulted in a mix of restrictive abortion bans and continued access across

[4] Chen Sheng was a well-known leader of a large peasants' revolt. This sentence in Chinese is *wang hou jiang xiang ning you zhong hu* (王侯将相，宁有种乎?), expressing the idea that insufficient intergenerational mobility has led to people's dissatisfaction and prompted them to rise up and overthrow the existing regime. *Historical Records* were written by Sima Qian during 104–118 B.C. They are the representative of the Chinese ancient books and have been widely passed down through the generations.

[5] Guo, Fei'er. "Li Xiaolin: Adhering to Great Love and Engaging in Public Welfare Must Come from the Heart (*Li Xiaolin: Jianshou da'ai zuo gongyi shiye yao you ai'xin*)." 9 Jul. 2013. http://news.sina.com.cn/c/2013-07-09/175927620660.shtml?ua=Mozilla%2F5.0+%28Windows+NT+10.0%3B+Win64%3B+x64%29+AppleWebKit%2F537.36+%28KHTML%2C+like+Gecko%29+Chrome%2F107.0.0.0+Safari%2F537.36. Accessed June 5, 2024.

[6] Title X, established in 1970 under the Public Health Service Act, is a U.S. federal program that supports family planning and related preventive health services, with the goal of improving public health outcomes and reducing unintended pregnancies.

different states (Heisler et al., 2024), highlight the need to understand the socioeconomic effects of reproductive policies.[7] In this paper, we explore how China's "later-longer-fewer" campaign (1971–1978) and the one-child policy (1979–2015) significantly increased intergenerational mobility in income, education, and social class.[8] We further analyze the key demographic groups and regional variations driving these mobility improvements and identify the underlying mechanisms linking the family planning policies to enhanced mobility.

A key feature of China's family planning policies is their consistent imposition of penalties on violators, including both economic and administrative sanctions. Fines, introduced during the one-child policy era, amounted to 1–5 years of household income. Administrative penalties, which began during the "later-longer-fewer" campaign, ranged from job demotion or dismissal to expulsion from the Chinese Communist Party (CCP) (Scharping, 2003). These sanctions varied across provinces over time, with stricter enforcement associated with higher penalties (McElroy and Yang, 2000; Ebenstein, 2010). We measure economic penalties using fine rates and quantify political sanctions by constructing measures of family planning emphasis in political propaganda of each province. Specifically, we perform a textual analysis of family planning-related propaganda in *People's Daily* (*Renmin ribao*), the official mouthpiece of the Chinese Communist Party, taking advantage of the observations of certain phrases (e.g., "jihua shengyu ("计划生育")" or "family planning").[9] The persistence and variation in fine rates and political costs allow us to explore the impact of family planning policies on intergenerational mobility before and after their implementation in 1971.

The enforcement of these policies reflected evolving leadership priorities. As the influence of Mao Zedong (advocating for large population) influence waned in the 1970s, new leaders emphasized population control to support economic growth and started restrictive fertility policies (Scharping, 2003; Greenhalgh and Winckler, 2005; Liu et al., 2014). In the late 1980s, family

[7] Center for Reproductive Rights After Roe fell: abortion laws by state. https://reproductiverights.org/maps/abortion-laws-by-state/. Accessed on July 5, 2024.

[8] The "later-longer-fewer" campaign (*wan xi shao*) firstly limited child number to fewer than three. In practice, the one-child policy effectively allowed 1.5 births. In some rural areas, families were permitted a second child if the first was a daughter, due to the perceived need for male labor in agriculture (Scharping, 2003).

[9] It is a well-established approach in the literature to use monetary fines as a proxy for the strength of the one-child-policy; although the policy may include various administrative measures, such as the loss of party membership or employment, scholars argue that the monetary fine is still a reliable indicator because stricter policies frequently come with higher fines (Hardee-Cleaveland and Banister, 1988; McElroy and Yang, 2000; Ebenstein, 2010; Liu, 2014; Huang, Lei, and Zhao, 2016). We discuss the exogeneity of the variations in the monetary fines in Section 2.2. The *People's Daily*, the largest newspaper in the People's Republic of China, serves as the official mouthpiece of the Central Committee of the Chinese Communist Party (CCP), the country's top decision-making body. Established in May 1946 as the CCP's official newspaper, it operates under the oversight of the Central Committee's Propaganda Department. Editorials and commentaries published in People's Daily reflect the viewpoints of Chinese leadership, making it central to understanding the Chinese propaganda apparatus and elite politics (Wu 1994). We document and demonstrate the relationship between key word density and policy execution intensity in detail in Section 2.3, and conduct a series of tests on the exogeneity of political costs regarding mobility.

planning became a key performance metric for local officials, prompting a surge in enforcement intensity (Scharping, 2003). Importantly, empirical evidence shows that enforcement variations were largely independent of local socioeconomic conditions (see Section 2 for further discussion), allowing us to treat these differences as exogenous.[10] Meanwhile, the fine rates and political propaganda of family planning emphasis were more intense among younger party secretaries and governors, but these tapered off for officials nearing the mandatory retirement age of 60 (or 65?) (also see Section 2).

To examine the impact of these policies, we employ a rank-rank regression model (Chetty et al., 2014), which captures the correlation between children's and parents' socioeconomic ranks and characterizes intergenerational persistence, the inverse of mobility, as the slope of this rank-rank relationship (Chetty et al., 2014). We focus on income, education, and social class persistence to provide a comprehensive assessment. We focus on income, education, and social class persistence to provide a comprehensive assessment: income persistence captures direct economic mobility; education persistence tends to be more stable over time; and social class persistence, a composite measure based on income, occupation, and social status, offers a broader view of societal standing. Examining the effects of family planning policies across all three outcomes provides a robust cross-verification of the policies' influence.

To ensure accurate rankings, we construct an extensive dataset of 2,096,978 child-parent pairs from birth cohorts spanning 1949–1996, a rare example of large-scale intergenerational data from a developing country often lacking administrative data. Instead of only considering children born during the policy era, we focus on those mothers were of childbearing age (21–35 years old, Huang (2022)) between 1971 and 2015. This approach captures spillover effects on those born before the policies, who would have had more younger siblings had the policies not been strictly enforced, an often overlooked factor (Huang, 2022). We further incorporate observable provincial and individual characteristics to control for demographic, geographic, and economic factors, while also controlling for parental age to minimize life cycle bias (Chetty et al., 2014; Emran and Shilpi, 2019).

We classify provinces into high-, middle-, or low-fine-rate or political-cost groups based on their average penalties, smoothing the impact of these policies on fertility decisions. Using difference-in-differences (DID) as our baseline identification strategy, we compare rank persistence across

[10] We regress the fine rates and political costs on one, two, three years previous demographics, macroeconomic conditions, government spending, social services, or political and social norms and find no significant correlations. See Sections 2.2 and 2.3 for more discussions on the regressions.

treatment (high-fine-rate or high-political-cost provinces) and control groups (low-fine-rate and low-political-cost provinces) before and after the policies' implementation, extending the method of Duflo (2001). Comparing rank persistence before and after the sequential implementation of the "later-longer-fewer" campaign and the one-child policy, we find that family planning policies significantly increased intergenerational mobility in China. Specifically, in high-fine-rate provinces, persistence in income, education, and social class decreased by 27.6%, 34.3%, and 23.6%, respectively, compared with that in low-fine-rate provinces. In high-political-cost provinces, these declines were similar—25.0%, 34.2%, and 46.3%, respectively, compared with low-political-cost ones.

A concern in policy analysis is that fine rates and political costs may influence each other, which could bias their individual estimated effects on rank persistence. We address this concern by conducting event studies to examine pre-trends against both variables. For pre-trend tests of fine rates, we narrow the time window of event studies and focus on provinces where political costs were relatively stable, which minimizes the interference of political costs during the implementation of fines; no significant pre-trends are found regarding the three outcome variables. Additionally, we perform correlation tests and find no significant reciprocal influence between fines and political sanctions. These results suggest that both variables operate independently, bolstering the causal interpretation of our findings.

To mitigate potential biases from unobserved factors, we instrument policy intensity using the ages of provincial governors and Chinese Communist Party secretaries, because in China's administrative system, younger officials have greater political prospects; they are incentivized to enforce stricter family planning policies as their outcomes are a key metric of their career advancement (Birney, 2014). The links between officials' age and policy intensity are supported by the data. The instrumental variable estimates confirm the robustness of our DID results, validating our identification strategy.

We further analyze upward rank mobility to explore the linearity of intergenerational persistence and pinpoint key contributors to mobility improvement by analyzing transition matrices that map the quintile ranks of children's income, education, and social class against those of their parents. Transition matrices show that children from the bottom three quintiles in high-fine-rate regions experienced substantial upward mobility, while top-quintile children faced significant downward shifts. These patterns were more pronounced in regions with stricter policy enforcement.

Meanwhile, comparisons across provinces with different political costs show similar conclusions. These observations suggest nonlinear persistence and that the overall increase in rank mobility is primarily driven by the upward movement of lower and middle-quintile families and the decline of families from the top quintile.

Why would family planning policies contribute to intergenerational mobility? We propose three hypotheses. First, "differential fertility," indicates that sanctions lead to varying fertility rates across socioeconomic groups, causing unequal investment in children's human capital (Chu and Koo, 1990; Fan and Zhang, 2010). Second, "resource concentration," posits that lower-income families, constrained by fines, have fewer children and can allocate more resources to each, enhancing upward mobility (Bailey, Malkova, and McLaren, 2019). Finally, "elite succession attenuation," suggests that political costs reduce relative fertility among elites, opening high-ranking positions to children from lower-ranking families (CITE).

Empirical evidence does not support the hypothesis that fertility policies merely affect family size. Although fines and political costs differentially impacted fertility, with fines more severely reducing fertility among lower-income families and political costs more strongly among elites, and our triple-difference estimates show a larger decrease in rank persistence for lower-income families compared to wealthier ones due to fines, the lack of significant differences between elite and non-elite families due to political costs suggests that differential fertility is not the primary pathway of mobility improvements following the implementation of family planning policies in China.

Based on the empirical verification of these hypotheses and predictions of our theoretical model, we find that resource concentration and elite succession attenuation provide the most effective explanations for the results and are more consistent with the empirical findings. In an overlapping-generations framework with high- and low-type families, we model persistence share variation and find that: (1) Lower-income families benefited from smaller family sizes due to these fertility restriction policies, which allowed for greater investments in education and non-cognitive skills, such as self-efficacy, ambition, and trust in other people; and (2) concurrently, reduced fertility among elites opened space at the top of the social hierarchy, enabling non-elite children to advance. Our theoretical framework applies broadly to contexts of family planning policies and is well-suited to explain China's experience.

This study advances several strands of economic literature by offering new insights into the

relationship between demographic policies and social mobility. First, it enriches the growing literature on the drivers of intergenerational mobility (Chetty et al., 2014; Corak, 2013; Bell et al., 2019; Connolly, Corak, and Catherine Haeck, 2019). While traditional research emphasizes interventions in education, housing, and wealth transfers (Pfeffer, 2011; Jackson et al., 2016; Chetty and Hendren, 2018a), our study identifies demographic policies as overlooked yet potent tools for reshaping opportunity structures. The dual mechanism, comprising resource concentration among lower-income families and elite succession attenuation, contributes novel insights into how structural barriers to mobility can be dismantled across generations.

Second, we extend the literature on fertility and economic outcomes by moving beyond absolute fertility metrics (Becker and Tomes, 1979; Becker, 1991; Galor and Weil, 2000; Lindahl, 2002; Black, Devereux, and Salvanes, 2005; Bailey, Malkova, and Mclaren, 2019; Jones and Tertilt, 2008; Bailey et al., 2019; Ngo, 2020). While prior studies explore fertility's correlations with income (Jones and Tertilt, 2008; Bailey et al., 2019; Daruich and Kozlowski, 2020), we demonstrate that family planning policies enhanced mobility not through mere fertility reductions but by reallocating resources and attenuating elite dominance. This extends Chu and Koo (1990), Fan and Zhang (2013), and Daruich and Kozlowski (2020)'s discussions on differential fertility by identifying resource concentration and elite succession attenuation as the key mechanisms driving mobility improvements. Our research bridges the gap between fertility policy and mobility, offering a more nuanced understanding of how family size interacts with human capital investments.

Third, we contribute methodologically by integrating China's "later-longer-fewer" campaign with the one-child policy into a unified analysis. Most prior studies isolate the one-child policy (with rare exceptions, such as Babiarz et al., (2018) and Chen and Fang (2021)), overlooking the cumulative effects of earlier policies. Our comprehensive approach mitigates pre-trend bias, providing a more comprehensive understanding of China's demographic transition and its socioeconomic consequences.

Fourth, we add to the literature on geographic variation in social mobility (Acemoglu et al., 2002; Dell, 2010; Chetty et al., 2014; Clark, 2014; Olivetti and Paserman, 2015; Chetty and Hendren 2018b; Donaldson 2018). Although prior studies document regional disparities in mobility outcomes, few have provided compelling causal evidence of factors driving these differences. We find that stricter enforcement0 through higher fines and political costs led to greater mobility

improvements in certain provinces, underscoring the role of institutional role shaping geographic disparities in development outcomes (Dell and Olken, 2020; Althoff and Reichardt, 2024).

Finally, this study develops a generalizable framework that extends beyond the Chinese context to assess the global implications of fertility policies for mobility. For example, recent abortion restrictions in certain U.S. states, although lacking comprehensive data to date, risk increasing fertility among low-income families, potentially diluting parental investments and reducing upward mobility. Anticipating how fertility-related policies influence mobility is crucial for policymakers to design effective interventions and mitigate potential unintended consequences (Daruich and Kozlowski, 2019; Bailey, Malkova, and McLaren, 2019).

The rest of the paper is organized as follows. Section 2 provides the policy background and discusses their sanctions for violators. Section 3 describes the dataset, key variables, and construction of the rank measures. Section 4 presents the empirical strategy, baseline results on rank persistence, and robustness checks. Section 5 presents upward mobility patterns across socioeconomic groups. Section 6 examines the underlying mechanisms through a theoretical framework and empirical tests. Section 7 concludes the paper.

2. Background

In this section, we present the institutional background of family planning policies in China and related economic and administrative penalties.

2.1. Overview of China's Family Planning Programs

China's fertility-reducing policies evolved across four distinct phases, profoundly influencing its demographic landscape. We present a timeline of these phases in Figure 1, which also exhibits their varying impacts on birth rates. Early efforts in the 1950s and 1960s were largely ineffective, while the subsequent "later-longer-fewer" campaign and one-child policy achieved dramatic reductions in fertility rates and stabilized population growth at a low level.

[Insert Figure 1 Here]

The first two phases (1954–1958 and 1962–1966) had limited impact on birth rates. With little oversight or legal backing, political upheavals during this period disrupted governance and hindered policy implementation. Additionally, Chairman Mao Zedong, who favored population

growth as a strategic asset during the Sino-Soviet Cold War, resisted lowering birth rates. Although the second phase included the formation of the State Family Planning Commission, the onset of the Cultural Revolution in 1966 disrupted governance, stalling these efforts.[11] As a result, fertility rates remained at six births per woman between 1949 and 1970, except during the Great Famine (1958–1961) (Freeberne, 1964; Banister, 1987; Greenhalgh and Winckler, 2005).[12]

In the 1970s, CCP leaders launched the "later-longer-fewer" campaign to mitigate resource constraints and support economic development. Championed by Premier Zhou Enlai, this campaign mandated later marriages (23 years for women, 25 for men), longer birth intervals (over three years), and fewer children (up to two) (Bongaarts and Greenhalgh, 1985; Qian, 2017). Though voluntary on paper, coercive methods such as political penalties, income and ration deduction, restricted access to essential goods and social benefits, job threats, and organized group pressure were widely employed (Scharping, 2003; Whyte, Feng, and Cai, 2015). By 1978, this campaign had halved the total fertility rate to 2.7 births per woman, contributing to the most significant decline in fertility rates before, during, and after this period, marking it as the most impactful phase in reducing population growth (Banister, 1987; Greenhalgh and Winckler, 2005; Whyte, 2019).

Following the success of the "later-longer-fewer" campaign, China introduced the one-child policy in 1979. This policy aimed to further reduce population growth through stringent enforcement mechanisms. The policy mandated strict legal, economic, and administrative measures, including significant financial penalties and administrative punishments for non-compliance. These measures effectively lowered the fertility from 2.72 births per woman in 1978 to 1.55 by 2000, making the one-child policy a vital factor in China's demographic transformation (Greenhalgh and Winckler, 2005; Qian, 2017).

These stringent fertility-reducing policies accelerated China's transition to an aging society by the 20th century. To counteract the demographic decline, the government introduced the two-child family planning policy and officially ended the one-child policy on January 1, 2016.[13] However, the expected surge in births did not occur, as fertility rates among young women continued to drop

[11] The Cultural Revolution, under the leadership of Mao Zedong, was a tumultuous socio-political movement aimed at preserving communist ideology in Chinese society. It halted most government operations by creating widespread political instability, disrupting bureaucratic functions, and redirecting national priorities away from governance and economic development towards ideological struggle and social control (Tsou, 1986).

[12] The Great Famine was brought on by a severe grain shortage, resulted from the central government's overestimation of food production and faked grain output figures reported by local cadres fearing not meeting the production goal. The death from the famine was estimated ranging from 16.5 to 30 million, many concentrated in infants and young children. The famine also caused China's fertility rate to plummet (Ashton et al., 1992; Becker, 1998).

[13] 中共中央 国务院关于实施全面两孩政策 改革完善计划生育服务管理的决定 https://www.gov.cn/xinwen/2016-01/05/content_5030806.htm

for three consecutive years, as shown in the Seventh National Population Census. In response, the three-child policy was announced on May 31, 2021, and formalized on August 20 through amendments to the Population and Family Planning Law, encouraging couples to have three children, with the aim of reversing demographic decline.[14]

2.2. Economic Sanctions for Violators

The one-child policy, building on earlier family planning efforts, imposed two primary types of penalties: economic and administrative sanctions. This section focuses on financial fines applied to families with unauthorized births, specifically those exceeding the number of children permitted under the policy. Since policy's enactment in 1979, the fine tool was widely enforced across China through legal statutes (Scharping, 2003; Ebenstein, 2010).

The enforcement of the one-child policy varied considerably across provinces, with stricter enforcement and higher fines consistently linked to lower fertility rates (McElroy and Yang, 2000; Scharping, 2003; Gu et al., 2007; Ebenstein, 2010). In line with previous research, we use provincial fine levels as a proxy for enforcement intensity, which captures the strength of policy implementation (e.g., McElroy and Yang, 2000; Ebenstein, 2010). These fines are calculated as the average penalty for a single unauthorized birth, expressed in multiples of the average annual household income. This method provides a standardized measure of enforcement strength across different regions and over time (Ebenstein, 2010). Provincial rates varied based on local standards and evolving policy implementation (McElroy and Yang, 2000; Scharping, 2003; Ebenstein, 2010). Figures A1 and A2 display these temporal and geographic variations from 1979 to 2000.

Changes in fine rates over time appear closely tied to the central government's evolving priorities regarding family planning. Initially, the central government directed provinces to enforce stringent penalties uniformly, led by Vice Premier Chen Muhua, who advocated for severe fines as effective deterrent (Scharping, 2003). However, due to widespread public resistance and concerns over social stability, the central government granted provincial governments more discretion in setting fine rates in the early 1980s. This shift led to uneven enforcement across provinces and a rise in unauthorized births (Gu et al., 2007).[15,16]

[14] 中共中央 国务院关于优化生育政策促进人口长期均衡发展的决定 https://www.gov.cn/zhengce/2021-07/20/content_5626190.htm

[15] The Guangdong provincial government received over 5,000 letters complaining about or protesting the OCP's implementation, raising concerns about social stability (Huang, Lei, and Sun, 2021).

[16] Document 11 in 1982 allowed provincial governments to issue specific and locally tailored regulations. Document 7 in 1984 stated that birth

In the late 1980s, as population control became a key appraisal metric for provincial officials (Scharping, 2003; Greenhalgh and Winckler, 2005), fine rates began to rise more uniformly. By 1990, local officials were required to report the average number of children per woman in their regions, and birth control was embedded as a central objective into the Eighth Five-Year Plan. The central government further incentivized compliance by encouraging higher fines through a responsibility system, which drove substantial increases in penalties (Gu et al., 2007; Birney, 2014). Between 1989 and 1992, the average fine rate surged from 1.0 to 2.8 times the average household's annual income, with 16 out of 30 provinces experiencing marked increases during this period (Figure A1).

While one might expect local socioeconomic conditions to influence fine rates, our analysis finds no significant correlation between changes in provincial fine rates and preceding trends in demographics, macroeconomic conditions, government spending, social services, or political and social norms (Table A1, columns 1–3).[17] These results, consistent with previous studies (Ebenstein, 2010; Liu, 2014; Huang, Lei, and Sun, 2021), suggest that fine rates were primarily driven by central directives, rather than local factors (more details in Section 5.3.2).[18] This finding supports the treatment of fine rate variations as exogenous in our analysis, conditional on covariates.

2.3. Administrative Sanctions for Violators

While financial penalties were formalized and strictly enforced during the one-child policy era, administrative sanctions for exceeding birth quotas served as a crucial deterrent under both the "later-longer-fewer" campaign and the one-child policy. Many families, even those financially capable of paying fines, complied due to the fear of administrative consequences, especially among political elites (Scharping, 2003). For instance, Li Xiaolin, daughter of former Premier Li Peng, famously expressed regret at not having a second child due to her father's insistence on adhering strictly to national policy:

"The greatest regret in my life is that if I could have a second child... but I absolutely cannot make this

control regulations would be developed in accordance with local conditions and approved by the provincial Standing Committee of the People's Congress and provincial governments (Gu et al., 2007).

[17] The indices included in the four groups are: (1) demography, including population size and birth and death rates; (2) basic economic conditions, such as GDP, Gini coefficient, wages, and the unemployment rate; (3) government expenditure and social services, including government expenditure share, doctors in hospitals per capita, and teachers in schools per capita; and (4) social services, such as political environment and social norms (boy preference). These factors possibly influence economic outcomes.

[18] For example, Ebenstein (2010) finds that the average fine in each prefecture was uncorrelated with the sex ratio before the one-child policy but became positively correlated with it after the policy's implementation. Similarly, Liu (2014) finds no significant relationship between fine amounts or the relaxed implementation of the policy and the preference for child quantity at the community level. Huang, Lei, and Sun (2021) report that variations in fine rates are not correlated with a range of provincial-level indices but are associated with the age and inauguration years of provincial leaders.

mistake. Because my father told me that as a leader of the country, if the children of leaders do not earnestly implement national policies, who else will? So, our class must also contribute to complying with the family planning policies."[19]

The political costs of having an above-quota child were severe. Violators were accused of "intentionally undermining the Party's family planning policy (*guyi pohuai dang de jihua shengyu zhengce*)," which jeopardized careers and political futures.[20] Administrative sanctions included demotions, job transfers, dismissals, and expulsions from the Communist Party—the most severe penalty, which permanently blocked any political advancement and employment opportunities, particularly for government employees (Scharping, 2003; Greenhalgh and Winckler, 2005). For rural residents, violating the policy meant losing autonomy in land allocation, cadre appointments, and quota distribution, putting them at a significant disadvantage within the collective (Li, 1995). Cadres who exceeded birth quotas faced dismissals, demotions, or severe marks on their personal records (Scharping, 2003).

Administrative penalties under both policies followed a consistent pattern, employing extensive propaganda, honor incentives, and disciplinary action within one's organization to ensure compliance, particularly targeting those with political affiliations; they were expected to set an example. Non-compliers faced not only the loss of political status but also severe political repercussions (Chen and Kols, 1982; Scharping, 2003; Greenhalgh and Winckler, 2005). In Section 4.4, we detail how machine learning techniques are employed to measure the intensity of administrative sanctions at the provincial level, which we denote as the political costs of these family planning policies. As shown in Figures A2 and A3, these costs vary significantly over time and across provinces. Similar to our findings on fines, regression analysis (Table A1, columns 4–6) shows no significant correlation between political costs and provincial socioeconomic indicators, reinforcing the exogeneity of these administrative sanctions. [21]

[19] See Footnote 2. Li Xiaolin's brother, Li Xiaopeng, who is currently serving as the Minister of Transport, also has only one child. Their father, Li Peng, was involved in the formulation of the one-child policy. For example, in the spring of 1989, Premier Li Peng called for the one-child policy to be supplemented with more detailed management by adding specific objectives and requiring that the outcomes of birth control be "evaluative." This led to local officials being mandated to report the average number of children per woman in their respective regions since 1990. Higher fine rates and stricter regulations were subsequently imposed to reduce fertility rates in the areas under their jurisdiction. (Greenhalgh and Winckler, 2005; Gu et al., 2007).

[20] See Article 166 of the Regulations of the Communist Party of China on Disciplinary Actions (*Zhongguo gongchandang jilü chufen tiaoli*): Those who violate population and family planning laws and regulations by exceeding birth limits will be given a serious warning or removal from Party positions; in serious cases, they will be placed on probation or expelled from the Party. Those who obstruct the implementation of population and family planning laws and regulations will be removed from Party positions or placed on probation; in serious cases, they will be expelled from the Party (《中国共产党纪律处分条例》第一百六十六条：违反人口与计划生育法律、法规超计划生育的，给予严重警告或者撤销党内职务处分；情节严重的，给予留党察看或者开除党籍处分。破坏人口与计划生育法律、法规实施的，给予撤销党内职务或者留党察看处分；情节严重的，给予开除党籍处分). The State Council, the People's Republic of China. https://www.gov.cn/test/2005-06/27/content_9927.htm. Access on Aug 16, 2024.

[21] Please refer to Sections 3 and 4 and Appendix A2 for the construction and descriptive statistics of political costs.

Together, economic fines and political costs provide a robust framework for measuring the strength of enforcement across regions and analyzing the causal effects of family planning policies on demographic and socioeconomic outcomes. We further discuss their relative independence in Section 4.2).

3. Key Measures and Data Construction

This section describes our empirical strategy to measure intergenerational mobility, and how we construct our main dataset and variables.

3.1. Measuring Intergenerational Mobility

We measure intergenerational mobility using two key metrics: rank persistence and upward rank mobility. These metrics allow us to compare mobility across different regions by ranking individuals' positions within national distributions of income, education, and social class (Chetty et al., 2014).[22]

Rank persistence captures the average outcome differences between children from higher and lower socioeconomic backgrounds, assuming a linear rank-rank relationship. It measures the correlation between the ranks of parents and their children within their respective cohorts and estimates the expected rank of children whose parents were at the bottom of the socioeconomic distribution. This measure is particularly useful because it is not sensitive to zero earnings or the ages at which income is measured (Chetty et al., 2014; Nybom and Stuhler, 2017).

Upward rank mobility focuses on the prospects of children from specific family backgrounds. Its most common representation is the transition matrix, which shows the probability of children moving between quintiles in the outcome distribution based on their parents' quintile position. For instance, the transition matrix can indicate the likelihood of a child from a lower-income quintile ascending to a higher quintile. This method also allows us to assess whether mobility is nonlinear and how it differs across the distribution—for example, whether children from middle-ranking families are more likely to move to the top, or whether those from lower-ranking backgrounds are more likely to rise to the middle (Chetty et al., 2014).

[22] Chetty et al. (2014) hold that *rank-rank* specification is more stable than other specifications for measuring intergenerational mobility and that it can also be applied to all variables including noncardinal variables (e.g., education, social class). Emran, Jiang, and Shilpi (2020) also argue that this specification results in the least bias in slope and intercept estimations when used to calculate intergenerational persistence in developing countries.

In this study, we examine intergenerational mobility through the lenses of income, education, and social class to offer a comprehensive understanding of parent-child mobility. Income mobility, widely used in literature, is valued for its clear interpretive power. Educational mobility addresses potential attenuation bias in income persistence, as education is a more stable characteristic over time (Feigenbaum, 2018). We also explore social class mobility, drawing on administrative hierarchy and wealth levels, providing a unique perspective on social status shifts within China. We explain in more detail about how we measure them using our constructed sample in Section 3.4.

3.2. Exposure to Family Planning Policies and Policy Intensity Across Provinces

We measure exposure to family planning policies based on whether a mother was biologically capable of reproduction during the policy era. Drawing on legal marriage age requirements and fertility patterns from census data where 86.4% of children were born when these mothers were aged 21 to 35, we define the prime fertility age for Chinese women as between 21 and 35 years (Huang, 2022). Children born to mothers within this age group are the focus of our analysis, as these women were most likely to be constrained by family planning policies. Even children born before the policy period are indirectly affected since potential younger siblings were not born due to these restrictions. Thus, a mother's cohort determines whether her family's fertility decisions were influenced by the policies: parents who lost reproductive capacity before 1970 were unaffected, while those with reproductive capacity post-1970 were directly impacted.

The enforcement intensity of family planning policies varied significantly across provinces and over time, shaped by shifting central government priorities and the personal ambitions, career prospects, and ages of provincial officials (see Sections 2.2, 2.3, and 5.3.2). To capture these variations systematically, we classify provinces based on their average levels of economic and political sanctions. Fine rates, which reflect economic penalties, are measured from 1979 to 2000, covering the core years of the one-child policy. Political costs, capturing administrative sanctions, are assessed over a longer span from 1971 to 2000 to include earlier enforcement efforts under the "later-longer-fewer" campaign. Each province is grouped into three categories based on its average fines: low-fine-rate (below the 50th percentile), middle-fine-rate (50th to 75th percentile), and high-fine-rate (above the 75th percentile). A similar classification applies to political costs, with provinces categorized as low-political-cost, middle-political-cost, or high-political-cost based on

the same percentile ranges. To ensure consistent treatment assignments, each province remains within the same group throughout the study period. By maintaining consistent classifications, we capture how fertility decisions respond to long-term policy environments rather than short-term enforcement fluctuations, which are less likely to shape significant demographic behavior (Babiarz et al., 2018). This stability also prevents individuals from being reassigned to different treatment groups due to minor birth-year variations, which could otherwise introduce bias into the analysis.

Our main analysis compares provinces with high- and low-average fine rates and high- and low-political costs. This design avoids distortions caused by borderline cases near classification cutoffs (e.g., provinces at the threshold between low and middle groups), which could otherwise skew sample distributions. As a robustness check, we incorporate middle-fine-rate and middle-political-cost provinces to ensure that our findings are not driven solely by extreme cases but hold broadly across all provinces (see Section 5.3.3).

The differences in penalty intensity between high- and low-rate groups are substantial. In high-fine-rate provinces, the average fine is 2.339 times the annual household income, compared to 1.172 times in low-fine-rate provinces, with an overall mean of 1.609 and a standard deviation of 0.552. For political costs, high-cost provinces average 1.437, while low-cost provinces average 0.124, with a provincial mean of 0.523 and a standard deviation of 0.938. The disparities, 0.725 times for fines and 2.511 times for political costs, highlight significant variation in policy enforcement across provinces.

3.3. Data and Key Variable Construction

Our analysis draws on ten nationally representative household surveys conducted between 1982 and 2018. These include the China Family Panel Studies, Chinese General Social Survey, China Health and Retirement Longitudinal Study, Chinese Household Finance Survey, Chinese Household Income Project, China Health and Nutrition Study, China Labor-Force Dynamics Survey, Chinese Social Survey, Population Census (Long Form database), and Urban Household Survey (Table A4).[23] We weight the sample by data source and control for data source fixed effects in all regressions (details in Section 4). These datasets provide comprehensive coverage of individual and family characteristics, including birthplace, residence, education, employment, employer type, income, occupation, political affiliation, number of children, hukou status

[23] These surveys were conducted every two years by academic institutions, universities, and official organizations between 1982 and 2018, except for the census data, which are from two consecutive surveys, 2000 and 2005.

(urban/rural), marital status, and additional demographic details (Zhao et al., 2014). For women, birth histories are also recorded.

Crucially, the data's detailed information on each household member's relationship to the household head (e.g., spouse, offspring, siblings, parents) allows for linking parent-child pairs, enabling the analysis of intergenerational outcomes in income, education, and social class across multiple generations. Our primary sample includes individuals whose mothers were biologically capable of reproduction during the family planning policy era, mostly children born between 1961 and 1996. These individuals either directly experienced the policy or were indirectly affected through the absence of younger siblings, which would have been born if the policy had not been strictly enforced (see Section 4). Most of these individuals had entered the labor market or completed their education by the survey years.

The full sample includes 2,096,978 parent-child pairs with available data on income, education, or social class. For the main analysis, we exclude parent-child pairs from middle-fine-rate and middle-political-cost provinces to avoid edge cases that could distort the results. This leaves 1,328,253 pairs from high- and low-fine-rate or political-cost provinces. A detailed statistical summary of the sample is presented in Appendix B.

We use all available data points to rank individuals within their birth cohorts. Children are ranked by cohort year, while parents are ranked separately by gender within their own birth years, and an average rank is computed. Following cultural expectations for gender roles in China for that period (Chu and Koo., 1990; Miles, 2013), we analyze father-child pairs as a robustness check (Section 5.3.3), as fathers' income typically reflects a family's economic standing more accurately in cases where a mother's homemaking role, despite strong family wealth, might skew average rank estimates.

To measure intergenerational persistence, we regress each child's rank in income, education, and social class against their parents' corresponding ranks. Income is defined as the total annual earnings from wages, employment (including vocational work), pensions, and capital or property-value gains. Education is measured by total years spent in formal schooling until achieving the highest graduation certificate (Hunter and Leiper, 1993). Social class is a composite variable, categorized into five levels—high, middle-high, middle, middle-lower, and lower—based on occupation, income, and access to benefits (Lu, 2003; Li and Zhang, 2008).[24]

[24] Based on the seminal sociology work of Lu (2003) on Chinese social stratification, governmental positions at the deputy bureau-director level (*fu ting ju ji*) and above were assigned to high class, those at the division-director (*xian chu ji*) or deputy division-director level (*fu xian chu ji*) to

As mentioned in Section 2.2, we use provincial fine rates to quantify the economic penalties for unauthorized births under the one-child policy. These rates, calculated as multiples of household income, were drawn from estimates by Ebenstein (2010), capturing the economic strength of enforcement.

We adopt a novel approach to measure the degree of political costs, which is based on using

To measure political costs, we use a machine-learning approach to analyze the frequency and content of family planning-related propaganda in *People's Daily*, the Chinese Communist Party's key publication, where significant policies receive extensive coverage, which local officials closely monitor (Wu, 1994). By examining the coverage of family planning policies, we develop a proxy for the intensity of political enforcement in each province from 1971 to 2000.

The political cost measurement follows three key step (more details in Appendix A2). First, word segmentation. We use an open source software library, *jieba,* to segment Chinese text semantically, ensuring that multi-character words are correctly identified.[25] Since individual characters often lack standalone meaning, proper segmentation is essential to prevent misinterpretation of the text.

Second, model training. We compile a training set from news articles containing seed words associated with family planning policies, including "*Jihua shengyu*" ("计划生育" or "family planning"), its abbreviated form "*Ji sheng*" ("计生" or "short form for family planning"), and several variants such as "*Jiating jihua*" ("家庭计划" or "family planning"), "*Shengyu*" ("生育" or "childbirth"), "*Wan hun*" ("晚婚" or "late marriage"), "*Wan yu*" ("晚育" or "late childbirth"), "*Shao sheng*" ("少生" or "fewer births"), "*You sheng*" ("优生" or "eugenics"), and "*You yu*" ("优育" or "good upbringing"). Using *Word2Vec* with negative sampling, we train a word embedding model to generate dense vector representations of words in the corpus. This model captures semantic relationships between words, revealing how closely specific terms align with the family planning narrative.

middle-high class, and those at the section-director (*xiang ke ji*) or deputy section-director level (*fu xiang ke ji*) to middle class. All other government workers are assigned to the middle-lower class. For observations without an associated governmental ranking, social class is assigned based on income. Following Li and Zhang (2008), who demonstrate that middle-class families had incomes of 60,000 to 500,000 *yuan* a year in 2005, we classify those with incomes higher than 500,000 *yuan* in 2005 as middle-high class, between 60,000 and 500,000 *yuan* as middle class, higher than the sample median income but lower than 60,000 *yuan* as middle-lower class, and lower than the sample median income as lower class. However, the assigned class for an agricultural worker could not be higher than middle class for a synthetic equivalent (Lu, 2003; Li and Zhang, 2008). The coefficient of the intergenerational social class persistence is then created by comparing the social class of each child to that of their parents.

[25] The library *jieba* contains a large dictionary of Chinese words, along with their relative positions and their respective frequencies, This library is available at: https://github.com/fxsjy/jieba.

Third, calculation and scoring. To quantify regional variation in political propaganda, we extract annual reports from *People's Daily* that mention each province by name, and use a "term frequency-inverse document frequency" (TFIDF) construction tool to compute the frequencies of word tokens.[26] We use the Multinomial Naive Bayes classifier, which provides a probabilistic framework for assessing how closely the report content aligns with the family planning narrative, to compute each province's annual family planning policy score by adopting machine learning software *scikit-learn* library.[27,28] The computed score represents the similarity between the provincial reports' language and the seed word-based vector embeddings, adjusted for report length to avoid biasing results in favor of provinces with more coverage.[29] We view this score as capturing the degree to which implementing family planning policies was an announced policy priority for the provincial government.

4. Rank Persistence: Identification Strategy and Empirical Results

Section 4 analyzes the impact of family planning policies on intergenerational persistence across income, education, and social class through a rank-rank regression framework, quantifying the strength of the parent-child rank correlation. It then examines the interplay between fines and political costs as enforcement tools. Robustness checks, including placebo tests, instrumental variables, and sensitivity analyses, ensure the reliability of findings by addressing potential biases from sample selection, omitted variables, control group choices, and concurrent policy effects.

4.1. Baseline Analysis and Results

This section evaluates how family planning policies in China influenced intergenerational mobility using a difference-in-differences (DID) framework embedded in a rank-rank regression model. This approach is widely regarded as the gold standard for measuring intergenerational persistence (Chetty et al., 2014; Emran, Jiang, and Shilpi, 2020; Gallipoli, Low, and Mitra, 2024). The model estimates how closely children's outcomes—ranked by income, education, and social

[26] From: http://scikit-learn.org/stable/modules/generated/sklearn.feature extraction.text.TfidfVectorizer.html.

[27] The Multinomial Naive Bayes model uses the training dataset constructed in the second step as the basis for computing a posterior probability that an unseen text passage is about family planning, based on a multinomial probability distribution model for the occurrence of tokens; the model is "naïve" in that it assumes a zero correlation in the joint occurrence of any pair of tokens.

[28] Please refer to: http://scikit-learn.org/stable/modules/generated/sklearn.naive bayes.MultinomialNB.html.

[29] Our approach makes use of "supervised" machine-learning algorithms, in that the algorithm is trained to recognize new report content in accordance with seed words. is similar to the approach in Gentzkow and Shapiro (2010), who use a keyword approach to identify the political slant of US newspapers. For other applications of machine-learning methods to classify free text in empirical research in economics, see the survey article of Mullainathan and Spiess (2017).

class—correlate with their parents' outcomes in their respective cohorts.

Empirical Specification

We modify the standard rank-rank regression model by incorporating interaction terms to capture differential policy effects in high-fine-rate and high-political-cost provinces. The baseline equation is:

(1) $rank^{c}_{ihbt} = \beta_0 + \beta_1 \cdot rank^{p}_{iHt} + \beta_2 \cdot rank^{p}_{iHt} \times high_fine_b + \beta_3 \cdot rank^{p}_{iHt} \times high_polcst_b + X_i \times (high_fine_b + high_polcst_b) + \tau_t + \lambda_b + \omega_h + \delta_M + \varphi_d + \varepsilon_{ihbt}$

where $rank^{c}_{ihbt}$ represents the rank of child i (born in province b) in the distribution of income, education, or social class with their birth cohort, h; $rank^{p}_{iHt}$ is the average rank of child i's parents across the same variables within parents' respective cohort H; $high_fine_b$ and $high_polcst_b$ are dummies capturing whether a child was born in a high-fine-rate or high-political-cost province, respectively; and X_i includes controls for parental ages and provincial fixed effects. Controlling for parental age attenuates life cycle bias (Chetty et al., 2014; Emran and Shilpi, 2019).[30] We also include year (τ_t), birth province (λ_b), child's birth cohort (ω_h), and mother's birth cohort (δ_M) fixed effects to capture time-invariant characteristics and temporal changes. ε_{ihbt} is the error term, and standard errors are clustered by the child's birth province to control for regional shocks.[31]

The coefficient β_1 represents the baseline intergenerational persistence in income, education, and social class, which is minimally impacted by family planning policies. The key coefficients of interest are β_2 and β_3, which capture differential changes in intergenerational persistence strongly affected by high fine rates and high political costs.

Baseline Regression Results

Table 1 presents the baseline regression results, showing how family planning policies reduced intergenerational persistence. In low-fine-rate and low-political-cost provinces, persistence coefficients are 0.348 for income (column 1), 0.477 for education (column 2), and 0.339 for social class (column 3). This result suggests that a one-percentile increase in the parents' average rank translates to increases of 0.348, 0.477, and 0.339 percentiles in their children's rank across income,

[30] See details in Section 4.2 about the construction of $fine_b$ and $polcst_b$, respectively. We control parents' age with ranking by parents' cohort, to attenuate life cycle bias (Chetty et al., 2014; Emran and Shilpi, 2019). We report alternative standard errors such as those using the two-way clustering of province and survey-source standard errors in Table C3. The results are robust to the different standard-error calculation methods.

[31] We report alternative standard errors such as those using the two-way clustering of province and survey-source standard errors in Table C3. The results are robust to the different standard-error calculation methods.

education, and social class, respectively.

[Insert Table 1 Here]

In high-fine-rate provinces, the persistence coefficients fall 0.096 for income, 0.164 for education, and 0.080 for social class, representing reductions of 27.6%, 34.3%, and 23.6% relative to baseline provinces. In high-political-cost provinces, persistence declines further, with coefficients dropping 0.087 for income, 0.163 for education, and 0.157 for social class—reductions of 25.0%, 34.2%, and 46.3%, respectively. These results indicate that policy enforcement disrupts the link between parents' and children's outcomes, enhancing mobility.

The largest reductions in persistence occur in education, underscoring the central role of educational attainment in mobility variation (Becker and Tomes, 1979). Specifically, high fines narrow the education rank gap between children of parents at the 75th and 25th percentiles by 8.2 percentiles, while high political costs reduce it by 8.15 percentiles. For income and social class, fine and political costs reduce the gaps by 4.0–7.85 percentiles, showing similar but smaller effects. These results highlight that political costs have a stronger effect than fines, especially in education and social class. than economic fines, especially in reducing educational and social class persistence.

We explore the timing and effects of family planning policies by examining whether pre-trends in intergenerational persistence existed before the implementation of the "later-longer-fewer" campaign and the one-child policy. This allows us to ensure that any observed policy effects are not driven by pre-existing trends across provinces with varying policy intensities.

Analysis of Pre-Trends: "Later-Longer-Fewer" Campaign

We first test whether provinces exhibited different rank persistence trends before the introduction of the "later-longer-fewer" campaign in 1971. The model specification is:

(2) $$rank_{ihbt}^{c} = \beta_0 + \beta_1 \cdot rank_{iHt}^{p} + \beta_2 \cdot rank_{iHt}^{p} \times high_fine_b + \sum_{\sigma=1965}^{1977} \beta_\sigma \cdot rank_{iHt}^{P} \times high_polcst_b \times Year_\sigma + \sum_{\mu=1965}^{1977} \beta_\mu \cdot X_i \times high_polcst_b \times Year_\mu + X_i \times high_fine_b + \tau_t + \lambda_b + \omega_h + \delta_M + \varphi_d + \varepsilon_{ihbt}$$

Here, $Year_t$ denotes the year when the mother was of childbearing age (21–35 years), indicating exposure to the policy in that specific year. 1971 serves as the baseline year.

Estimates across different specifications are reported in Table C1, and the main results are

visualized in Figure 2. In panels (a), (b), and (c), the solid line represents the regression estimates, while dashed lines indicate the 95% confidence intervals, with errors clustered at the provincial level.

[Insert Figure 2 Here]

The pre-trend analysis shows no significant differences in intergenerational persistence before 1971 between provinces with high and low political costs. The effects emerge only after 1972, aligning with the implementation of the campaign, confirming that the policy induced a persistent reduction in rank persistence. These magnitudes are consistent with the baseline results reported in Table 1.

Analysis of Pre-Trends: One-Child Policy

Next, we analyze pre-trends before the one-child policy, implemented in 1979. Since political costs preceded fines, a potential concern is that early political sanctions might interfere with the later implementation of fines. This overlap could cause confounding if political sanctions affected fertility behaviors in ways that complicate interpreting the effect of fines alone (the following content provides evidence of no predictive relationship between the two treatments). Ideally, a narrow time window where the first treatment (political costs) remains constant would prevent early changes from influencing the later implementation of fines. However, as such a time window is unavailable nationwide, we select the 1974–1984 period, spanning five years before and after fines were introduced, focusing on provinces where political cost changes were minimal (bottom 10%). This minimizes interference from political costs during the introduction of fines. For instance, this sample includes provinces Tianjin, Shanxi, Guangxi, and Gansu. The model specification for this analysis is:

(3) $rank_{ihbt}^{c} = \beta_0 + \beta_1 \cdot rank_{iHt}^{p} + \sum_{\sigma=1974}^{1984} \beta_\sigma \cdot rank_{iHt}^{P} \times high_fine_b \times Year_\sigma + \tau_t + \lambda_b + \omega_h + \delta_M + \varphi_d + \varepsilon_{ihbt}$

where 1979 is the comparison year, when the one-child policy was officially implemented.

Using 1979 as the baseline year, we find no evidence of pre-existing differences in rank persistence before the policy's introduction. The estimates are presented in Figure 3 and Table C2, showing that the one-child policy's implementation led to significant declines in intergenerational persistence across all three dimensions—income, education, and social class. The estimates align

with the baseline findings in both direction and magnitude, demonstrating that both policies contribute uniquely to changes in intergenerational persistence.

[Insert Figure 3 Here]

To further verify the independence of political costs and fine rates, we conduct the following two regressions:

(4) $fine_{i,t} = \sum_{j=1}^{7} \beta_j \cdot polcst_{i,t-j} + \tau_t + \lambda_i + \varepsilon_{it}$

(5) $polcst_{i,t} = \sum_{j=1}^{7} \gamma_j \cdot fine_{i,t-j} + \tau_t + \lambda_i + \varepsilon_{it}$

where i denotes the province, t the year, $fine_{i,t}$ the fine rate in province i at year t, and $polcst_{i,t}$ the political cost at the same location and time. We include year (τ_t) and province (λ_i) fixed effects, with standard errors clustered at the provincial level to account for correlated shocks within regions over time.

The results, reported in Table A2, indicate that none of the lagged coefficients are statistically significant, except for a weak association at the fifth lag (p = 0.082). This weak correlation suggests that political costs might have a minor effect on fine rates, but the overall influence is statistically negligible. Thus, the independence of the two policy measures is maintained, ensuring the robustness of our baseline regression results.

4.2. Permutation Placebo

We conduct permutation tests to assess whether our observed effects are not artifacts of random variation. This method checks whether the treatment assignment, the high-political-cost and high-fine-rate provinces, drives the results or if they arise by chance.

We randomly reassign treatment labels, high-political-cost and high-fine-rate, across provinces while keeping the rest of the data unchanged, generating 1,000 placebo samples. For each sample, we run our baseline DID model to estimate placebo treatment effects. This creates a distribution of placebo coefficients under the null hypothesis that no meaningful relationship exists between the treatment and outcomes.

The distribution's 5th and 95th percentiles, presented in Table C7, provide a non-parametric confidence interval for the placebo distribution against which we compare our original estimates. If the observed coefficients from our baseline regressions (in Table 1) are outside the range of these percentiles, it indicates that the treatment effects are unlikely to be due to chance. As shown

in Table C7, none of the placebo coefficients are statistically significant, suggesting that our original results lie outside the placebo range. This strengthens the argument that the observed effects are not random artifacts but are driven by the underlying treatment assignments. This strengthens the argument that the observed effects are not random artifacts but are driven by the underlying treatment assignments. Moreover, these findings validate the parallel trends assumption, showing no significant pre-existing differences between treatment and control groups prior to policy implementation.

4.3. Potential Confounding Impact of Contemporary Educational Policies

One potential concern is that contemporary educational policies, which can change the distribution of human capital accumulation among individuals with different backgrounds, may have influenced intergenerational mobility, confounding the effects of family planning policies. We use China's university reenrollment and enrollment expansions starting in 1977 and lasting from then on as a proxy. These reforms significantly reshaped university demographics, increasing access to higher education, and could be correlated with changes in persistence outcomes over time (Alesina et al., 2020).

As a measure of the policy strength, we employ provincial university enrollment rates of relevant cohorts. Specifically, we interact enrollment rates with parental ranks in income, education, and social class, adding these interactions as control variables to test whether the family planning effects remain significant after accounting for these policies.

The results, reported in Table C11, show that while contemporary educational policies positively influence intergenerational mobility, the key coefficients for family planning policies remain statistically significant and consistent with the baseline findings. Therefore, both family planning policies and the expansion of college enrollment contribute to the dynamics of intergenerational mobility. The former weakens the transmission of advantage across generations by reducing fertility and concentrating resources, while the latter expands access to higher education, broadening the talent pool. These findings confirm that family planning policies play an independent and significant role in reshaping intergenerational mobility, even when controlling for concurrent education reforms.

4.4. Instrumental Variable Analysis

While our primary analysis relies on a DID framework to estimate the effects of family planning policies on intergenerational persistence, concerns exist that time and provincial fixed effects might not fully capture the influence of omitted variables, potentially biasing estimates. To mitigate these concerns and further validate our results, we employ an instrumental variable (IV) approach.

We use the weighted average age of provincial governors and party secretaries during a mother's childbearing years as instruments for the fine rates and political costs imposed under family planning policies.[32] The logic follows from China's administrative system: First, policy shifts were linked to career incentives. In the early 1980s, provincial officials largely complied with centrally set fine rates. However, after 1989, family planning policy enforcement became a key component of performance evaluations for officials. Younger provincial leaders, i.e., those with stronger career prospects, were incentivized to implement stricter policies to enhance their promotion prospects (Huang, Lei, and Sun, 2021). Second, political incentives were exogenous. Younger officials who intensified family planning policies were not systematically replaced due to poor economic performance, suggesting that the economic and political sanctions they enforced were exogenous to broader policy changes. Thus, a negative relationship between provincial officials' average age and the intensity of fines and political costs offers a valid source of exogenous variation for policy enforcement.

To validate this instrument, we examine its potential impact on omitted variables that could influence local intergenerational persistence. By controlling for fixed effects and province-specific time trends, we regress various local macroeconomic indices—such as demographic trends, economic conditions, government expenditure, and health and education levels—on the age of provincial governors and Party secretaries, respectively, from one, two, and three years prior. The results show no significant correlations (Table C9), indicating that while younger provincial officials might support more progressive economic policies, key economic indicators (which could theoretically influence local intergenerational persistence) were not significantly shaped by their governance, even when they enforced stricter family planning policies.

To ensure the validity of the instrument, we examine whether officials' average age correlates

[32]The leaders age data is from *China Vitae* (https://www.chinavitae.com/) and *Baidu Baike* (https://www.baike.baidu.com/), which compile and disseminate biographies of Chinese leaders in political, military, educational, commercial, and media spheres.

with potential omitted variables that could influence local intergenerational persistence. Specifically, we regress key provincial macroeconomic indicators, such as GDP per capita, government spending, education levels, and health outcomes, on officials' age from one to three years prior to the observation period. As reported in Table C9, the results show no significant correlation, supporting the exclusion restriction assumption.

While younger officials may have incentives to enforce stricter family planning policies due to career promotion prospects, they do not directly control broader socioeconomic outcomes like income distribution or educational attainment. This distinction is essential: policy enforcement intensity can vary with officials' age, but the outcomes we measure, such as intergenerational mobility, are driven by complex structural factors beyond individual officials' direct influence. Therefore, while younger officials may shape how rigorously policies are implemented, they cannot dictate the resulting changes in long-term socioeconomic indicators, ensuring that our instrument influences the treatment but not the outcome directly.

We implement a two-stage least squares (2SLS) regression, following the baseline specification from Section 4.1. The first stage shows strong instrument relevance, with F-statistics exceeding 11.1, well above the conventional threshold for weak instruments (Stock, Wright, and Yogo, 2002). The second-stage results, summarized in Table C10, align closely with the DID estimates in terms of both magnitude and direction. The coefficients on income, education, and social class persistence remain negative and statistically significant, reinforcing the baseline findings. This consistency across models suggests that omitted variable bias does not substantially affect the main results.

4.5. Inclusion of Middle-Penalty Provinces

In our main analysis, we exclude individuals born in middle-political-cost and middle-fine-rate provinces to focus on clear-cut cases from high- and low-penalty regions. Omitting intermediate cases could introduce sample selection bias or obscure how varying intensities of family planning policies affect rank persistence. We therefore incorporate individuals from middle-penalty provinces into the baseline group, which now includes those from low-political-cost and low-fine-rate regions, to test whether the inclusion of these borderline cases influences the core findings on intergenerational mobility.

Table C3 presents the results from this expanded analysis. Across all rank persistence measures,

income, education, and social class, the coefficients remain consistent with the main results, both in direction and magnitude. The similarity of these results to the baseline analysis suggests that our key findings are not artifacts of sample selection. Whether or not individuals from middle-penalty regions are included, the core pattern remains: stricter family planning policies weaken intergenerational persistence, promoting mobility, particularly in high-penalty provinces.

The consistency of results strengthens the credibility of our causal interpretation. It implies that family planning policies have robust effects across varying provincial contexts, regardless of minor variations in penalty intensity. This also confirms that the intermediate penalty levels, while relevant, do not fundamentally alter the relationship between policy intensity and intergenerational mobility. Thus, the mobility improvements observed in high-penalty provinces reflect broader structural changes induced by family planning enforcement.

4.6. Alternative Parental Ranking, Co-Residency Bias, and Cohort Reweighting

In the main analysis, we use the average rank of both parents to represent parental status, reflecting the combined influence of both mother and father on intergenerational persistence. To account for China's prevalent male-breadwinner norms (Bongaarts and Greenhalgh, 1985), we replace the parental ranking with the father's rank to examine whether focusing exclusively on paternal influence affects the results. The child-father paired sample yields key coefficients that remain significantly negative and consistent with the baseline regressions in both magnitude and direction (Table C12), suggesting that our results are robust.

Co-Residency Adjustment

A potential source of bias arises from the social norm that male offspring being more likely to reside with their parents compared to female offspring (Ebenstein, 2010; Whyte, 2019), potentially skewing the data provided by primary respondents. Surveys such as the national census, the Chinese General Social Survey, the Chinese Household Income Project, and the Urban Household Survey rely on primary respondents to report on co-residing family members, which may introduce missing or incomplete data on non-co-residing individuals. In contrast, surveys like the China Family Panel Studies and the China Health and Nutrition Study mitigate this bias by asking about all family members, regardless of their living arrangements (Emran and Shilpi 2019).

To address this concern, we generate a subsample excluding surveys likely to suffer from co-

residency bias. As shown in Table C13, the results from this restricted sample are consistent with the baseline findings, suggesting that co-residency bias does not significantly alter our conclusions about family planning policies' impact on intergenerational mobility.

Cohort Reweighting

Assuming that each cohort contributes equally to the estimation of the average treatment effect of family planning policies, we reweigh the models by cohort sample sizes. This approach accounts for variations in the sample size across birth cohorts, ensuring that no cohort disproportionately influences the overall results. The results in Table C14 confirm significant negative effects of family planning policies on intergenerational persistence in income, education, and social class. These findings align with our baseline analysis, reinforcing the robustness of the conclusions.

We consolidate the main results from all empirical approaches in Figure 4, which displays the key point estimates and their 90% confidence intervals. Across all robustness checks, including variations in sample, model specification, and IV analysis, the findings remain consistent: Provinces with higher political costs or higher fine rates exhibit significantly lower intergenerational persistence in income, education, and social class. This suggests that stricter family planning policies effectively weakened the link between parents' and children's socioeconomic outcomes, promoting greater intergenerational mobility and reducing the advantages inherited across generations.

[Insert Figure 4 Here]

5. Upward Rank Mobility: Empirical Results

The preceding analysis demonstrates that family planning policies (1971–2015) reduce intergenerational rank persistence, thereby fostering greater mobility. However, the reduction in persistence alone does not reveal whether these changes are driven primarily by upward mobility from lower-income families or downward movement among higher-status families. This section employs quintile transition matrices for income, education, and social class to capture the probability of moving across socioeconomic ranks based on parental background. The goal is to identify which groups benefit most from family planning policies and assess whether the policies primarily promote upward mobility for disadvantaged groups or weaken persistence at the top

(Chetty et al., 2014).

Income Rank Mobility

Table 2 presents the income mobility transition matrix for individuals affected by family planning policies, showing the probability of children moving across income quintiles relative to their parents in low-penalty provinces. It also details differences in transition probabilities between high- and low-fine-rate provinces, and high- and low-political-cost provinces.

Notably, the patterns suggest substantial reshuffling across income groups. Children born into the lowest quintile have a 47.3% chance of rising to a higher quintile, while those from the second-lowest quintile show a higher upward movement probability of 52.7%. These findings suggest that family planning policies enhance economic opportunities for poorer households. At the other end of the spectrum, 71.8% of children from the highest quintile move downward, with children from the second-highest quintile facing a 58.1% chance of slipping into lower quintiles, reflecting a weakening of income persistence among wealthier families. Middle-quintile children exhibit relatively balanced mobility, with a 34.8% probability of rising into the top two quintiles and a 43.0% likelihood of falling into the bottom two. This pattern reflects the transitional nature of the middle quintile, with these children neither strongly confined to their initial socioeconomic position nor showing extreme movement to either end of the distribution. Such mobility reflects the transitional nature of the middle quintile, where economic outcomes are more variable compared to the higher or lower ends of the distribution. The average probability of upward mobility for all four non-top quintiles is 37.6%. This nonlinear pattern suggests that family planning policies not only promote upward mobility for children from lower-income families but also reduce the persistence of economic advantages among wealthier families.

[Insert Table 2 Here]

Comparing provinces with varying policy intensities reveals the role of family planning policies in shaping these outcomes. High-fine-rate provinces exhibit particularly large mobility gains. The average probability of upward mobility for all four non-top quintiles improved by 2.6 percentage points. In high-political-cost provinces, the patterns are similar: Upward mobility increases by 6.8 percentage points from the lowest quintile compared to low-fine-rate provinces. The average probability of upward mobility for all four non-top quintiles improved by 2.63 percentage points.

These results indicate that stricter enforcement of family planning policies enhances opportunities for lower-income families while reducing the intergenerational advantages of wealthier families.

Educational Rank Mobility

Table C5 reveals that family planning policies similarly reshape educational outcomes. The transition matrix shows that mobility in education follows a pattern consistent with income. For example, children from the lowest education quintile exhibit the highest upward mobility, with a 44.4% chance of moving to a higher quintile, and the average probability of upward mobility for all four non-top quintiles is 22.1%. At the same time, 69.0% of children from the top education quintile experience downward movement.

In high-fine-rate provinces, children from the lowest education quintile are 7.8 percentage points less likely to remain at the bottom compared to their counterparts in low-fine-rate regions, while the probability of moving to the top quintile increases by 5.2 percentage points. Across all four non-top quintiles, the average upward mobility improves by 11.1 percentage points, indicating that stricter policy enforcement helps reduce educational persistence at the bottom and promotes upward movement. Conversely, at the upper end, 69.0% of children from the highest education quintile experience downward mobility in high-fine-rate provinces, suggesting that family planning policies erode persistence at the top, redistributing educational advantages. A similar trend is evident in high-political-cost provinces, where children from the lowest education quintile are 16.1 percentage points less likely to remain in the bottom quintile. The average upward mobility for all non-top quintiles improves by 12.1 percentage points, further supporting the idea that family planning policies promote upward educational mobility for lower-ranked families while diminishing persistent advantages at the top.

Social Class Rank Mobility

The social class mobility matrix in Table C6 reflects a consistent trend across socioeconomic dimensions. Children from the lower three quintiles have a 30.1% probability of moving to a higher social class, while the average upward mobility for all four non-top quintiles is 23.9%. Meanwhile, children from the highest quintile face a 70.4% likelihood of moving downward. This reshuffling indicates that family planning policies weaken social class persistence among higher-ranked families.

In high-fine-rate provinces, the average upward mobility for all non-top quintiles improves by 2.57 percentage points. Similarly, high-political-cost provinces show a smaller but positive increase of 0.82 percentage points in upward mobility for the same groups. These results suggest that stricter enforcement amplified the redistribution of opportunities, leading to more fluidity in social class ranks.

Overall, this section highlights the role of family planning policies in enhancing upward mobility for children from lower-ranked families while eroding the intergenerational persistence of socioeconomic advantages among higher-ranked families. The most pronounced effects are observed in high-fine-rate and high-political-cost regions, where stringent enforcement amplified these dynamics. By reshaping the distribution of opportunities, these policies contributed to a more equitable social structure, promoting greater socioeconomic mobility across generations.

6. Understanding Mechanisms

Having established the link between family planning policies and intergenerational mobility, we now turn to understanding the mechanism behind this effect. To explain our main findings, a mechanism needs to meet two key criteria: (1) it should be correlated with policy intensity, such as fines or political costs, and (2) its impact should vary systematically across socioeconomic groups.

We propose three hypotheses. The first is "*differential fertility*," which suggests that policy enforcement creates uneven fertility reductions across socioeconomic groups, with lower-income families responding more strongly to fines and political elites more strongly to political costs (we find this only a partial explanation, so we explore two other potential channels). A second hypothesis is "*low-rank resource concentration*." Fewer children in lower-income families allow for more intensive investments in each child's education and development, improving their mobility prospects. A third hypothesis is "*elite succession attenuation*." Political costs reduce fertility among elites, limiting the transmission of privilege and freeing up opportunities for children from non-elite families. We present empirical evidence for each hypothesis and find that the observed patterns align most closely with the combined effects of resource concentration and elite succession attenuation, which can be explained by our theoretical model. We explore the three potential mechanisms in detail one by one.

6.1. Differential Fertility

A widely cited explanation for the relationship between family planning policies and enhanced intergenerational mobility is differential fertility. Theoretical models suggest that restricting fertility among low-income families can lead to more equitable outcomes through resource concentration, improving income distribution both in the steady state and during transitional periods (Chu and Koo, 1990). However, the question remains whether this mechanism fully explains the observed patterns of mobility across socioeconomic and political groups in China.

Testing Differential Fertility:

Empirical Analysis

We begin by hypothesizing that economic fines and political sanctions affect fertility decisions differently based on families' income levels and political status. Lower-income families are expected to be more sensitive to financial penalties, while political elites may respond more strongly to political costs due to the potential career repercussions. To examine this hypothesis, we apply a DID framework with the following model:

(4) $Above_Quota_Birth_{ibt} = \beta_0 + \beta_1 Fine_{bt} \times Poor_{it} + \beta_2 PolCost_{bt} \times Gov_{it} + \beta_3 Fine_{bt} + \beta_4 PolCost_{bt} + X_i'\beta_5 + \tau_t + \lambda_b + \varphi_d + \sigma_{ibt}$

where the dependent variable measures the number of above-quota births in child i's family at time t, $Poor_{it}$ indicates families in the lower 50% income bracket in year t, and Gov_{it} represents elite families with government affiliations, i.e., at least one parent holds communist party membership or government-affiliated position. The interaction terms β_1 and β_2 capture how economic and political sanctions influence fertility differently across these groups. Event study results (Appendix D1) show no significant pre-existing trends, supporting the validity of this DID approach.

The results in Table 3 show that both fines and political costs effectively reduce above-quota births. Each fine equivalent to a parent's annual income decreases above-quota births by 5.9 percentage points (column 1), while political sanctions reduce them by 7.7 percentage points, confirming the effectiveness of these policies across demographic groups. Column 2 further reveals heterogeneity: lower-income families experience an additional 5.6-point reduction due to fines, while political elites show a 5.8-point reduction under political sanctions. These findings

align with the hypothesis that family planning policies shape fertility decisions differently across income and elite groups.

[Insert Table 3 Here]

Fertility and Rank Persistence: Triple-Difference Analysis

To explore whether these fertility changes translate into higher intergenerational mobility, we extend the analysis using a triple-difference framework, investigating how family background influences the effect of family planning policies on rank persistence:

(8) $$rank^{c}_{ihbt} = \theta_0 + \theta_1 \cdot rank^{p}_{iHt} + \theta_2 \cdot rank^{p}_{iHt} \times high_fine_b + \theta_3 \cdot rank^{p}_{iHt} \times high_polcst_b + \theta_4 \cdot rank^{p}_{iHt} \times high_fine_b \times Poor_{iHt} + \theta_5 \cdot rank^{p}_{iHt} \times high_polcst_b \times Polelite_{it} + \theta_6 \cdot high_fine_b \times Poor_{iHt} + \theta_7 \cdot high_polcst_b \times Polelite_{it} + \theta_8 \cdot rank^{p}_{iHt} \times Poor_{iHt} + \theta_9 \cdot rank^{p}_{iHt} \times Polelite_{it} + \theta_{10} \cdot Poor_{iHt} + \theta_{11} \cdot Polelite_{it} + \theta_{12} \cdot X_i \times (high_fine_b + high_polcst_b) + \tau_t + \lambda_b + \omega_h + \delta_H + \varphi_d + \varepsilon_{ihbt}$$

The key interaction terms θ_4 and θ_5 allow us to analyze how fines and political costs affect rank persistence across income and elite backgrounds.

The results in Table 4 show that fines substantially improve mobility for lower-income families, decreasing rank persistence by 9.3 percentage points in income, 5.1 points in education, and 7.1 points in social class. These reductions reflect increased opportunities for upward mobility within these families. However, political costs do not produce a significant difference in rank persistence between elite and non-elite families, suggesting that political sanctions are less effective in reducing elite privilege.

[Insert Table 4 Here]

While differential fertility explains part of the mobility improvements among lower-income families, it does not fully account for the persistence trends observed among political elites. This discrepancy suggests that political elites may maintain their advantages through channels unrelated to fertility, such as access to exclusive education or professional networks, weakening the influence of political sanctions on mobility outcomes.

These results imply that while family planning policies have succeeded in enhancing mobility for economically disadvantaged families, they have been less effective in dismantling

intergenerational privilege among elites. Thus, additional mechanisms beyond fertility regulation must be explored to understand the full scope of intergenerational mobility

6.2. Further Exploration

Building on the partial contributions of differential fertility, we develop a theoretical framework to further explore how family planning policies influence intergenerational mobility. This model reveals two mechanisms: resource concentration among lower-income families and elite succession attenuation, both of which are tested empirically to explain the pathways through which economic and political sanctions shape mobility outcomes.

6.2.1. A Theoretical Framework

We assume each parent lives through two stages: childhood and adulthood. In childhood, they are invested in education by their parents (denoted as e); as adults, they allocate income between personal consumption (m) and their children's human capital investment. Family size (n) determines how resources are divided among children. Parents' utility function represented as:

$$U(n, e, m) = \ln n + \alpha \ln e + m \quad (5)$$

where α ($0 < \alpha < 1$) reflects the trade-off between having more children and investing in their education. While the traditional preference in Chinese society favors quantity ("more sons, more blessings"), penalties for unauthorized births alter these preferences.

Economic Constraints and Family Planning Penalties

Families are classified into high-type and low-type groups based on whether their wealth is above or below the median of their generation, with wealthier families (high-type) holding wealth $w_h = \theta w_l$, where low-type families hold wealth w_l and $\theta > 1$ captures inequality.[33] Family planning policies impose both economic fines (b_o) and political costs (b_e) for above-quota births, with political costs additionally for political elites (indicated by $I(e) = 1$). The penalties for a child born above the quota ($b_l(w_l)$ for low-type families and $b_h(w_l)$ for high-type ones) are normalized against wealth as:

[33] We assume wealth is mainly accumulated by family income. Chinese people used to reluctantly build wealth through real estate, capital gains, collectibles and other non-cash wealth management methods from the establishment of the current regime to the 2000s, due to the impact of communist ideology and absence of property law before March 2007. The Chinese 2007 Property Law made progress in strengthening ownership rights and restraining the grabbing hand of local government by providing equal protection to public and private properties and allowing people to own the premises of their houses or businesses (Zhang, 2008).

(6) $$b_l(w_l) = \frac{b_o + I(e)b_e}{w_l}$$

(7) $$b_h(w_l) = \frac{b_o + I(e)b_e}{\theta w_l}$$

The budget constraint is:

(8) $$w_{l,h} = ne + (n-1)b_{l,h}(w_l) + \mathrm{m}$$

which reflects the trade-off between family size, educational investment, and penalties for unauthorized births.

The consumption, m, can therefore be expressed as:

(9) $$m = w_{h,l} - (\mathrm{n}-1)\left(\frac{b_{h,l}(w)}{w_{h,l}}\right) - ne$$

Plugging equation (9) into the utility function (5), we can express the utility maximization function as:

$$\max\ U(n,e) = \ln n + \alpha \ln e + \left(w_{h,l} - \frac{(n-1)b_{h,l}(w)}{w_{h,l}} - \mathrm{ne}\right)$$

To maximize utility, parents choose the optimal number of children n^* and the level of educational investment per child e^*. The first-order conditions for maximizing the utility function are:

(10) $$\frac{\partial U}{\partial n} = 0, \text{ or } \frac{1}{n^*} - \left(\frac{b_{h,l}(w)}{w_{h,l}} + e^*\right) = 0$$

and (11) $$\frac{\partial U}{\partial e} = 0, \text{ or } \frac{\alpha}{e^*} - \beta n^* = 0$$

Solving these conditions yields the optimal family size and investment in children for both low- and high-type families as follows:

(12) $$n_l^* = (1-\alpha)\frac{w_l}{b_o + I(e)b_e}$$

(13) $$e_l^* = \frac{\alpha}{(1-\alpha)}\left(\frac{b_o + I(e)b_e}{w_l}\right)$$

(14) $$n_h^* = (1-\alpha)\frac{\theta w_l}{b_o + I(e)b_e}$$

(15) $$e_h^* = \frac{\alpha}{(1-\alpha)}\left(\frac{b_o + I(e)b_e}{\theta w_l}\right)$$

These solutions show that both fines and political costs reduce fertility ($n_{l,h}^*$) while increasing investment per child ($e_{l,h}^*$), concentrating resources within smaller families.

Intergenerational Mobility and Rank Persistence

Building on Fan and Zhang (2013), the probability of a child becoming high-type depends on educational investment, e. For low-type children, the probability to grow into a high-type adult is $1 - exp(-e_l)$, and for high-type children, the probability to remain high-type is $1 - exp(-e_h)$. The persistence share, P, representing the proportion of individuals remaining in their parents' socioeconomic group, is:

$$P = (1-\lambda)n_l exp(-e_l) + \lambda n_h\big(1 - exp(-e_h)\big) \tag{16}$$

where λ denotes the proportion of high-type parents.

Substituting the equations (12)–(14) of n_l^*, n_h^*, e_l^*, and e_h^*, we derive:

$$P = (1-\lambda)\frac{(1-\alpha)w_l}{b_o + I(e)b_e}\exp\left(-\frac{\alpha(b_o + I(e)b_e)}{(1-\alpha)w_l}\right) + \lambda\frac{(1-\alpha)\theta w_l}{b_o + I(e)b_e}\left(1 - \exp\left(-\frac{\alpha(b_o + I(e)b_e)}{(1-\alpha)w_l}\right)\right) \tag{17}$$

Interpretation of Results

The persistence share equation (17) provides a mathematical lens to understand how family planning policies, particularly through economic fines b_o and political costs b_e, affect intergenerational persistence. We analyze their effects by examining the partial derivatives $\frac{\partial P}{\partial b_o}$ and $\frac{\partial P}{\partial b_e}$ (Appendix D2 provides detailed calculations).

(a). Impact of fines (b_o) on persistence

The derivative $\frac{\partial P}{\partial b_o}$ measures how changes in fines affect persistence across income groups. Since fines apply uniformly across families, regardless of their political connections, the focus is on the overall effect of fines in reducing persistence. The second derivation $\frac{\partial}{\partial b_o}\left(\frac{\partial P}{\partial b_o}\right) < 0$ suggests that as fine intensity increases, the marginal effect of fines in lowering persistence also increases. In other words, higher fines increase the likelihood that persistence will decline. This result aligns with the findings in Table 1, where high-fine-rate provinces exhibit significantly lower rank persistence (row 2), reinforcing that financial sanctions effectively diminish intergenerational continuity.

The analysis also reveals that $\frac{\partial}{\partial w_l}\left(\frac{\partial P}{\partial b_o}\right) > 0$, meaning lower-income families are more sensitive to fines. As their income decreases, the negative impact of fines on persistence becomes more severe. This insight reflects the disproportionate burden fines impose on poorer families, decreasing the probability for these families to maintain rank across generations. Additionally, the

derivative $\frac{\partial}{\partial \theta}\left(\frac{\partial P}{\partial b_o}\right) > 0$ indicates that as the wealth gap widens between high-type and low-type families, fines become more effective in reducing persistence. This is consistent with empirical evidence in Section 6.1, where resource-constrained families in high-fine-rate provinces decreased greater intergenerational rank persistence than wealthier ones.

The underlying mechanism is that higher fines reduce the optimal number of children (n_l^*), as shown in equation (12), thereby concentrating more resources on each child. The enhanced investment in human capital, represented by e_l^* in equation (13), boosts the children's prospects for upward mobility. This effect is particularly pronounced in regions with high fine intensities, where resource-constrained children increased upward mobility and were better positioned to compete with peers from wealthier families, aligning with the empirical results in Section 5.

(b1). Impact of political costs (b_e) on political elites

The derivative $\frac{\partial P}{\partial b_e}$ evaluates how political costs affect intergenerational persistence among political elites (denoted by $I(e) = 1$). Political costs are imposed as additional penalties on political elites for exceeding child quotas, reducing their fertility, as shown in equations (12) and (14). However, the effect of political costs on persistence remains theoretically ambiguous. Neither the first nor second derivatives of $\frac{\partial P}{\partial b_e}$ provide a clear direction, indicating the indeterminate nature of political costs' impact.

This ambiguity aligns with the empirical results from Section 6.1, where no significant difference in persistence reduction between elite and non-elite families is observed. Although political costs reduce fertility among elites (equation 14, Table 4), given the substantial resources elites already invest in their children, diminishing marginal returns may make these children maintain their socioeconomic status (Black et al., 2005; Chetty et al., 2014), muting the expected reduction in persistence. Thus, while political costs lower fertility, their overall effect on elite persistence remains uncertain.

(b2). Rank and mobility for low-type families

Despite the observed ambiguity for elites, empirical evidence suggests that political costs improve upward mobility for lower-ranked families, as shown in Section 5. This can be explained by how reduced fertility among elites frees up opportunities for children from non-elite families.

Given λ presents the proportion of high-type (many being political elite) families, the rank of low-type parents is $R_{p,l} = 1 - \lambda$. The rank of children from low-type families who remain in the same group can be expressed as:

$$R_{c,l} = 1 - \frac{n_l(1-\lambda)\big(1 - exp(-e_l)\big) + \lambda n_h(1 - exp(-e_h))}{\lambda {n_h}^* + (1-\lambda){n_l}^*}$$

The expectation of the children's rank ($\mathbb{E}(R_{c,l})$) is:

$$\mathbb{E}(R_{c,l}) = 1 - exp(-e_l) + exp(-e_l)(1 - \frac{n_l(1-\lambda)\big(1 - exp(-e_l)\big) + \lambda n_h(1 - exp(-e_h))}{\lambda {n_h}^* + (1-\lambda){n_l}^*})$$

To determine the effect of reducing elite fertility on the rank of low-type children, we take the partial derivative of $\mathbb{E}(R_{c,l})$ with respect to ${n_h}^*$, yielding:

$$\frac{\partial \mathbb{E}(R_{c,l})}{\partial {n_h}^*} = -\exp(-e_l) \times \frac{\lambda(\exp(-e_l) - \exp(-e_h))}{(\lambda n_h^* + (1-\lambda)n_l^*)^2} < 0$$

This negative derivative indicates that a decrease in the number of elite children (${n_h}^*$) raises the expected rank of children from low-type families. Thus, as political costs reduce elite fertility, more opportunities become available for children from non-elite families to rise in the socioeconomic hierarchy.

From equations (13) and (15), it is evident that while political costs b_e decrease elite fertility ${n_h}^*$, they do not affect the fertility of low-type families ${n_l}^*$. Consequently, increasing political costs enhances the rank expectation of children from low-type families $\mathbb{E}(R_{c,l})$, facilitating upward mobility. By reducing elite fertility, political costs ensure fewer elite children occupy top positions, enabling children from lower-ranked families to ascend the socioeconomic ladder.

Identified Mechanisms

The analysis of partial derivatives for fines and political costs uncovers two key mechanisms through which family planning policies influence intergenerational mobility:

Mechanism 1: Resource Concentration in Lower-Income Families

The impact of family planning policies on intergenerational persistence is context-dependent. Specifically, the reduction in persistence is more likely when fines are substantial, income levels among lower-ranked families are low, and the wealth gap between high- and low-income families is wide. Under these conditions, fines disproportionately reduce fertility rates among lower-income

families, resulting in higher resource concentration per child. This increased resource allocation enables greater investments in education and human capital, facilitating upward mobility and reducing persistence. Consequently, fines weaken intergenerational persistence by enabling children from low-income families to compete more effectively with wealthier peers.

Mechanism 2: Elite succession attenuation

Political costs curb fertility among elites, reducing competition at the top of the social hierarchy and freeing up opportunities for non-elite families. Although elite families may reallocate more resources per child, fewer elite children compete for top ranks, enabling children from lower-income families to move up in the socioeconomic hierarchy. Thus, the overall effect of political costs on intergenerational persistence is twofold: while elite persistence is indeterminate, the reduction in elite fertility fosters upward mobility for non-elite families. In the China context, the latter effect is large enough to see an overall persistence decline, making the net effect an increase in upward mobility for lower-ranked families.

6.2.2. Empirical Evidence

We empirically examine the identified mechanisms in the theoretical model in the China context, ensuring that theory and evidence align.

6.2.2.1. *Low-rank Resource Concentration*

The theoretical model predicts that fines reduce fertility more sharply among lower-income families, leading to greater resource allocation per child, ultimately promoting upward mobility. Table 5 presents triple-difference regression results to test this mechanism.

[Insert Table 5 Here]

Children from lower-half income families in high-fine-rate provinces exhibit significantly better outcomes compared to both higher-income families in the same provinces and children in low-fine-rate provinces. Specifically, marriage gifts increase by 63.8 percentage points, compared to higher-income families (column 1); educational investments rise by 63.6 percentage points (column 2); and non-cognitive traits like self-efficacy, ambition, and trust improve by 8.2, 6.6, and 1.3 percentiles, respectively (columns 3–5). These figures suggest that with fewer children, lower-income families can better concentrate financial and emotional resources. The improvements in

non-cognitive skills, critical for long-term economic success, align with previous literature on the importance of non-cognitive traits in human capital formation (Cunha & Heckman, 2007).

The empirical evidence confirms the first mechanism from our theoretical model: family planning policies reduce persistence by enabling resource concentration among lower-income families. This mechanism plays a significant role in diminishing intergenerational economic barriers, helping children from disadvantaged backgrounds better compete with wealthier peers. Supporting this, Bailey, Malkova, and McLaren (2019) show that U.S. family planning programs (1964–1973) boosted children's economic status, with post-program cohorts achieving higher household incomes, less likely to live in poverty, and less dependent on public assistance, attributed partly to enhanced parental resources through reduced fertility. Daruich and Kozlowski (2020) develop a model estimating economic outcomes in the U.S. during the 2000s, finding that policies reducing incentives for lower-income households to have children can lower inequality and increase social mobility, also resonating with this mechanism.

6.2.2.2. *Elite succession attenuation*

The empirical results in Section 6.1 reveal that family planning policies reduced fertility more sharply among political elites than non-elites. Yet, rank persistence between these groups shows little divergence, suggesting that while elite families benefit from concentrated resources due to fewer children, diminishing marginal returns constrain their upward mobility. As a result, elite children's rank gains were not sufficient to outperform non-elite children's advances, consistent with the theoretical predictions in Section 6.2.1.

To further explore this mechanism, we re-rank income, education, and social class outcomes separately for political elites and non-elites. This approach identifies whether upward mobility occurs primarily within each group or through non-elites surpassing elites. If mobility gains were confined to intra-group movement, we would expect no significant inter-group shifts.

The transition matrices for income, education, and social class (Table D2-D7) show that lower-ranked families in the high-treatment groups have lower upward rank changes within the two groups. Specifically, for non-elite families' income rank, in high-fine regions and high-political-cost regions compared to low regions, non-elite families display steady upward mobility across quintiles, but the average probability of upward mobility for all four non-top quintiles actually decreased by 5.54 and 3.38 percentage points, respectively (Table D2). This indicates that if we only look at rank within groups, the higher upward mobility in high-treatment regions, as shown

in Section 5 (Table 2), no longer holds. Similarly, for elite families, in high-fine regions and high-political-cost regions, the average probability of upward mobility for all four non-top quintiles also decreased by 1.84 and 2.17 percentage points, respectively (Table D3). Similar patterns emerge for education (Table D4 and D5) and social class mobility (Table D6 and D7).

This reversal suggests that non-elite children tend to surpass elite children in stricter enforcement regions. If mobility gains were limited to intra-group dynamics, the gap would remain positive or neutral. These results confirm the elite succession attenuation mechanism: by reducing elite fertility, family planning policies limited the elites' ability to dominate top positions, creating opportunities for non-elite children to rise. Although elites still benefit from concentrated investments, the overall reduction in fertility restricts their capacity to maintain dominance.

7. Summary and Concluding Remarks

This study shows how China's family planning policies reshaped intergenerational mobility by reducing rank persistence in income, education, and social class. The most significant gains were seen among lower-income families, who experienced greater upward mobility, while high-ranking families experienced downward shifts. Our analysis identifies two key mechanisms driving these outcomes: resource concentration in smaller, low-income families and reduced elite succession, which redistributed opportunities across generations.

The repeal of these policies in 2016, followed by the introduction of the two-child policy and, later, the three-child policy, presents new challenges. If fertility rebounds, resource allocation per child in low-income families may weaken, while elites may reclaim dominant positions, narrowing mobility. This re-concentration of opportunity risks exacerbating inequality, highlighting the delicate balance between demographic policies and economic outcomes.

China's experience offers broader lessons for other countries implementing reproductive policies. For instance, restrictions on abortion in some U.S. states may similarly increase fertility among low-income families, curbing mobility and enabling wealthier groups to consolidate their advantages. Future research could explore these dynamics across various policy contexts to further illuminate how fertility control shapes social mobility, predictable in our theoretical framework.

Our findings also resonate with global trends of declining fertility, as economic pressures prompt many young people to delay or avoid having children (Fauser et al., 2024). While raising children is costly, our study suggests that smaller families can enhance mobility by enabling parents to

concentrate on each child's education and development. This insight offers a counter-narrative: in resource-limited environments, smaller family sizes may provide an effective strategy for upward mobility.

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Figures and Tables

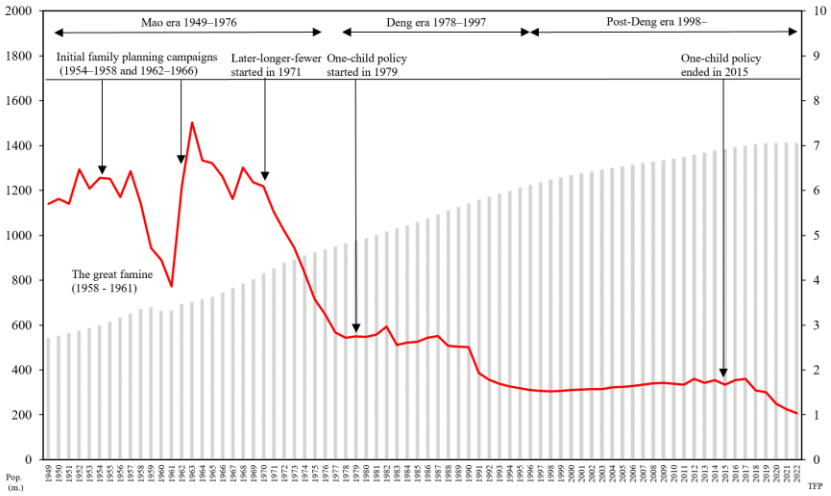
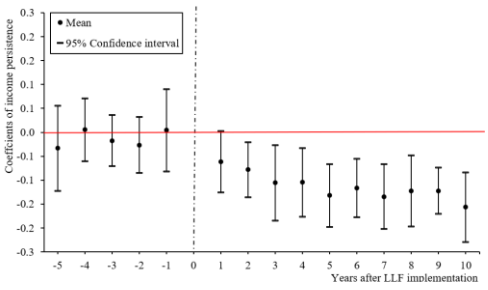
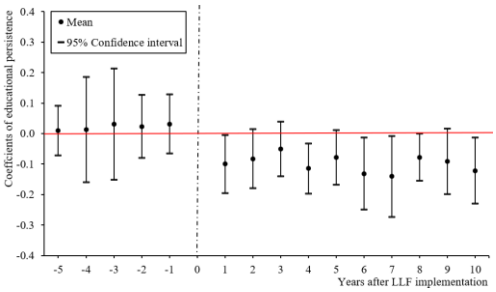


FIGURE 1. CHINA'S POPULATION, TOTAL FERTILITY RATE, CORRESPONDING HISTORICAL EVENTS, AND FERTILITY POLICIES

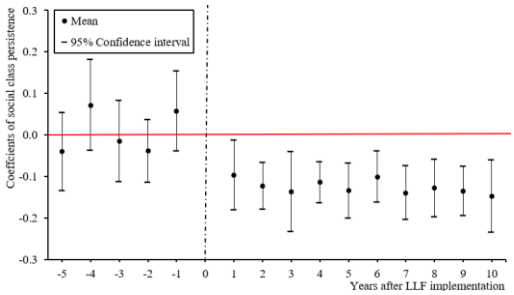
Note: The red line in the figure represents the total fertility rate (TFP), and the gray bars represent the total population. Data sources are the China Statistical Yearbook and the UN's World Population Prospects.



(a) Relative Income Persistence



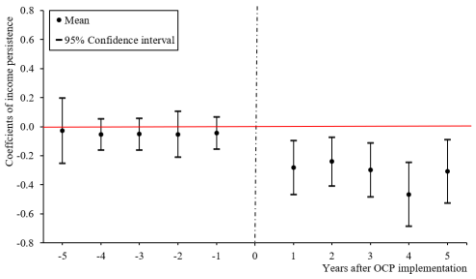
(b) Relative Educational Persistence



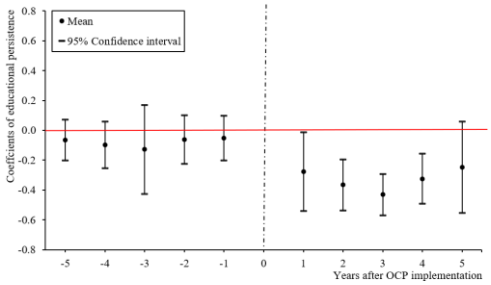
(c) Relative Social-Class Persistence

FIGURE 2. THE DYNAMIC IMPACTS OF LATER-LONGER-FEWER" CAMPAIGN ON INTERGENERATIONAL PERSISTENCE

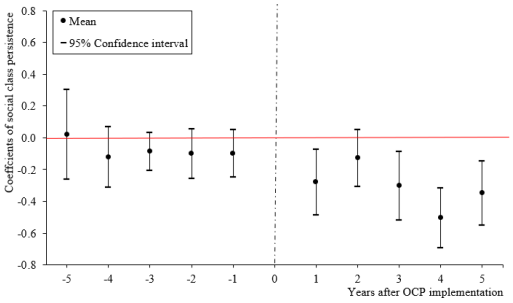
Note: Figures (a), (b), and (c) illustrate the dynamic impacts of Later-Longer-Fewer" Campaign on income, education, and social-class persistence, respectively, over a timeline that spans five years before and ten years after the "later-longer-fewer" campaign (the standard is based on mothers' cohorts). In each figure, the solid line represents the estimated coefficients, while the dashed lines denote the 95% confidence intervals, with standard errors clustered at the provincial level.



(a) Relative Income Persistence



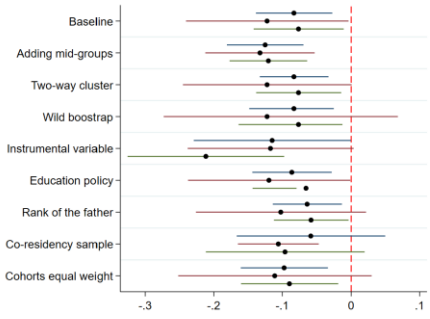
(b) Relative Educational Persistence



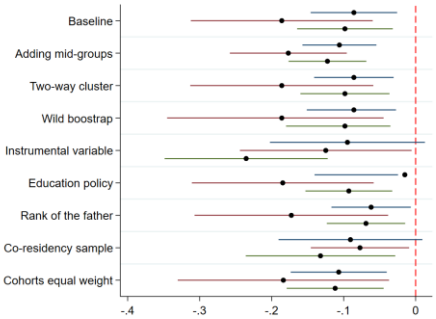
(c) Relative Social-Class Persistence

FIGURE 3. THE DYNAMIC IMPACTS OF ONE-CHILD POLICY FINES ON INTERGENERATIONAL PERSISTENCE

Note: Figures (a), (b), and (c) illustrate the dynamic impacts of One-Child Policy fines on income, education, and social-class persistence, respectively, over a timeline that spans five years before and ten years after the "later-longer-fewer" campaign (the standard is based on mothers' cohorts). In each figure, the solid line represents the estimated coefficients, while the dashed lines denote the 95% confidence intervals, with standard errors clustered at the provincial level.



(a) High fine X rank



(b) High political X rank

FIGURE 4. SUMMARY OF ROBUSTNESS— FAMILY PLANNING POLICY'S EFFECT ON RELATIVE PERSISTENCE

Note: The dots represent the coefficients of high political cost or high fine rate, and the lines represent the 95% confidence intervals from robustness estimations. Each label on the vertical axis corresponds to a distinct robustness check.

TABLE 1. EFFECT OF FAMILY PLANNING POLICIES ON RELATIVE PERSISTENCE

	Income rank (1)	Educational rank (2)	Social class rank (3)	Income rank (4)	Educational rank (5)	Social class rank (6)
Rank	0.348***	0.477***	0.339***	0.380***	0.328***	0.321***
	(0.029)	(0.063)	(0.031)	(0.033)	(0.027)	(0.035)
Rank X High fine	-0.096***	-0.164**	-0.080**	-0.097***	-0.078**	-0.076**
	(0.027)	(0.063)	(0.028)	(0.027)	(0.029)	(0.028)
Rank X High Political Cost	-0.087***	-0.163**	-0.157***	-0.100**	-0.076**	-0.097***
	(0.029)	(0.060)	(0.029)	(0.034)	(0.029)	(0.030)
Poor X Fine				-0.079**	-0.054**	-0.067*
				(0.033)	(0.020)	(0.035)
Political Elite X Political Cost				0.021	-0.025	-0.113***
				(0.047)	(0.017)	(0.026)
Province FE	X	X	X	X	X	X
Cohort FE	X	X	X	X	X	X
Mother Cohort FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Observations	227,116	781,995	229,666	227,116	244,514	227,422
R-squared	0.149	0.246	0.111	0.151	0.170	0.109

Note: Each cell presents the coefficient derived from estimating the impact of policy intensity—specifically, whether being born in a province with high fines or high political costs—on income, education, and social class persistence. The dependent variables are the ranks of children's income, education, and social class within their cohort. The primary independent variable is a dummy indicating whether the birth province belongs to the high-fine-rate or high- political cost group, interacting with their parents' corresponding rank within the parents' cohort. All regressions include controls for survey-year fixed effects (FE), birth province FE, cohort and mother cohort FE. Columns 4, 5, and 6 also control for poor and political elite status. Robust standard errors are clustered at the provincial level. ***, **, and * indicate statistical significance at the levels of 1%, 5%, and 10%, respectively.

TABLE 2. UPWARD INCOME MOBILITY

	Children in quintile 1 (1)	Children in quintile 2 (2)	Children in quintile 3 (3)	Children in quintile 4 (4)	Children in quintile 5 (5)
Parents in quintile 1	52.70	14.17	14.88	12.11	6.14
Difference H-L Fine	-3.52	1.03	-0.53	0.12	2.90
Difference H-L Political Cost	-6.75	6.07	-0.04	0.12	0.61
Parents in quintile 2	27.82	19.47	22.65	21.57	8.49
Difference H-L Fine	1.73	-2.24	4.85	-2.55	-1.79
Difference H-L Political Cost	-7.55	4.29	4.52	-0.81	-0.45
Parents in quintile 3	24.43	18.60	22.12	18.16	16.69
Difference H-L Fine	3.48	-0.56	-7.10	7.84	-3.66
Difference H-L Political Cost	-6.07	6.07	-3.09	6.00	-2.91
Parents in quintile 4	16.35	17.37	24.35	26.57	15.35
Difference H-L Fine	2.70	-0.85	0.23	-4.46	2.38
Difference H-L Political Cost	-1.23	3.94	2.56	-2.68	-2.59
Parents in quintile 5	12.92	10.28	16.88	31.69	28.23
Difference H-L Fine	3.35	2.84	6.21	-3.04	-9.36
Difference H-L Political Cost	1.46	6.08	5.75	-3.21	-10.08

Note: Each cell reports the percentage of children that grew up in a given income quintile in their parents' income distribution who ended up in a specific income quintile in their own cohort's earnings distribution in the low-fine-rate, low-political-cost provinces, the difference in the percentage between high- and low-fine-rate provinces, or between high- and low-political-cost provinces. Children's income is ranked within their birth cohort's income distribution, and the parents' income is ranked within their own cohort's income distribution. We include those whose mothers have reproductive capability during the family planning period.

TABLE 3. ECONOMIC PENALTIES AND POLITICAL COSTS ASSOCIATED WITH VIOLATING FAMILY PLANNING POLICIES PRESENT DIVERSE INFLUENCE ON FERTILITY DECISIONS

	Above-quota birth	Above-quota birth
	(1)	(2)
Fine	-0.059***	-0.028*
	(0.017)	(0.016)
Political Cost	-0.077*	-0.068*
	(0.042)	(0.037)
Poor X Fine		-0.056***
		(0.006)
Political Elite X Political Cost		-0.058**
		(0.027)
Province FE	X	X
Year FE	X	X
Observations	7,710,624	5,992,478
R-squared	0.336	0.361

Note: Each column reports the coefficient from an estimation of policy intensity (fine rates or political costs) on the dummy variable indicating above-quota births. We also control for whether parents are in the lower half of the income distribution and political elite. All regressions are controlled for province FE, and year. Robust standard errors are in parentheses and clustered by province. ***, **, and * indicate statistical significance at the levels of 1%, 5%, and 10%, respectively.

TABLE 4. ONE-CHILD POLICY'S EFFECT ON POOR VERSUS RICH FAMILIES: NUMBER OF SIBLINGS, BIRTH AGE, WEALTH TRANSMISSION, AND NONCOGNITIVE SKILLS

	Marriage gift from parents	Education investment from parents	Self-efficacy	Ambition	Trust
	(1)	(2)	(3)	(4)	(5)
Poor X High fine	0.638*	0.636*	8.225**	6.586*	1.341*
	(0.356)	(0.311)	(3.060)	(3.860)	(0.727)
Poor	-0.333	-0.257	0.083	4.421	-0.263
	(0.253)	(0.152)	(1.938)	(3.097)	(0.388)
Province FE	X	X	X	X	X
Cohort FE	X	X	X	X	X
Mother Cohort FE	X	X	X	X	X
Year FE	X	X	X	X	X
Observations	1,395	16,231	5,026	3,562	50,582
R-squared	0.193	0.214	0.065	0.159	0.091

Note: Each column reports the coefficient from an estimation of policy intensity (fine rates or political costs) on different outcome variables between poor (the lower half) and rich families. The dependent variables are logarithms of marriage gift from parents, educational investment from parents, and quantiles of noncognitive skills: self-efficacy, ambition, and trust. All regressions are controlled for survey-year fixed effects (FE), province FE, mother Cohort FE, and cohort FE. Robust standard errors are in parentheses and clustered by province. ***, **, and * indicate statistical significance at the levels of 1%, 5%, and 10%, respectively.

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Appendix A. Penalty-Related Figures and Tables

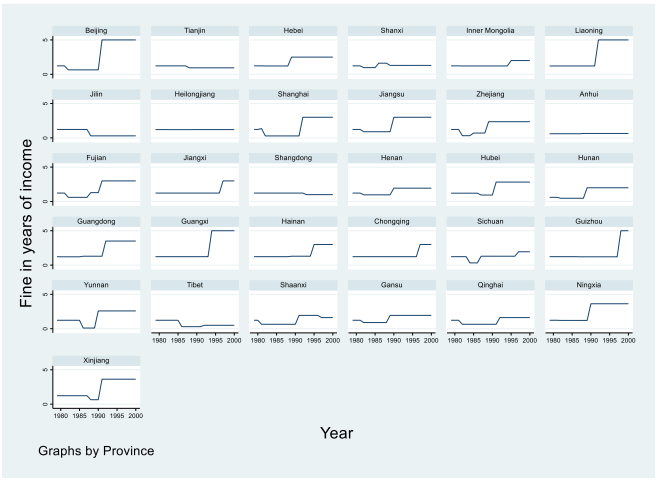
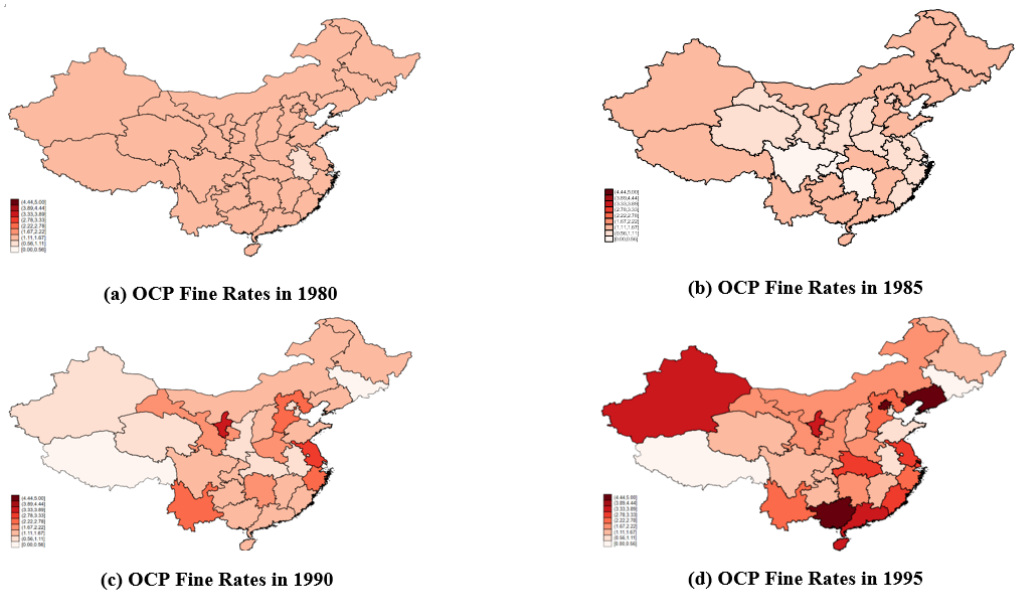


FIGURE A1. THE ONE-CHILD POLICY FINE RATES (1979–2000), BY PROVINCE

Note: Data comes from Ebenstein (2010). The fine rates are measured as multiples of local household annual income in 31 provinces and municipalities from 1979 to 2000. The severity of the fine rates reflects the strength of the OCP's implementation.



(a) OCP Fine Rates in 1980

(b) OCP Fine Rates in 1985

(c) OCP Fine Rates in 1990

(d) OCP Fine Rates in 1995

FIGURE A2. THE ONE-CHILD POLICY FINE RATES ACROSS MAINLAND CHINA OVER TIMES

Note: The heat maps visualize fine rates in each province at different times: 1980, 1985, 1990, and 1995, showing geographical changes in fine rates over time. Lighter colors correspond to lower fine rates.

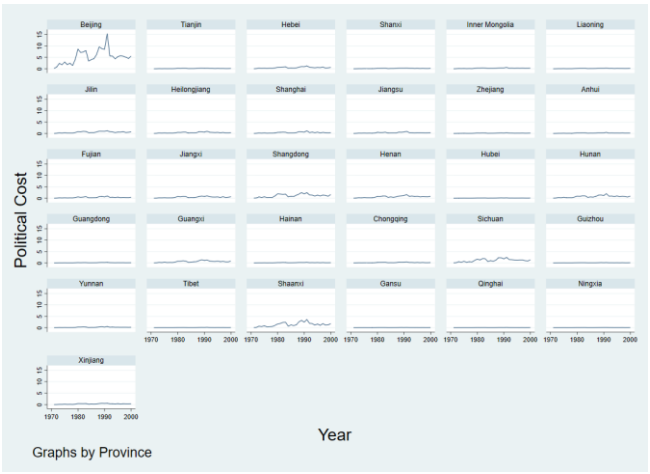


FIGURE A3. THE POLITICAL COSTS FROM 1971–2000, BY PROVINCE

Note: Data are sourced from the density of family planning-related keywords in provincial reports within the *People's Daily*, using machine learning algorithms (refer to Section 3.2). The dataset covers 31 provinces and municipalities from 1971 to 2000. Political costs measure the severity of administrative penalties, reflecting the strength of family planning policy enforcement.

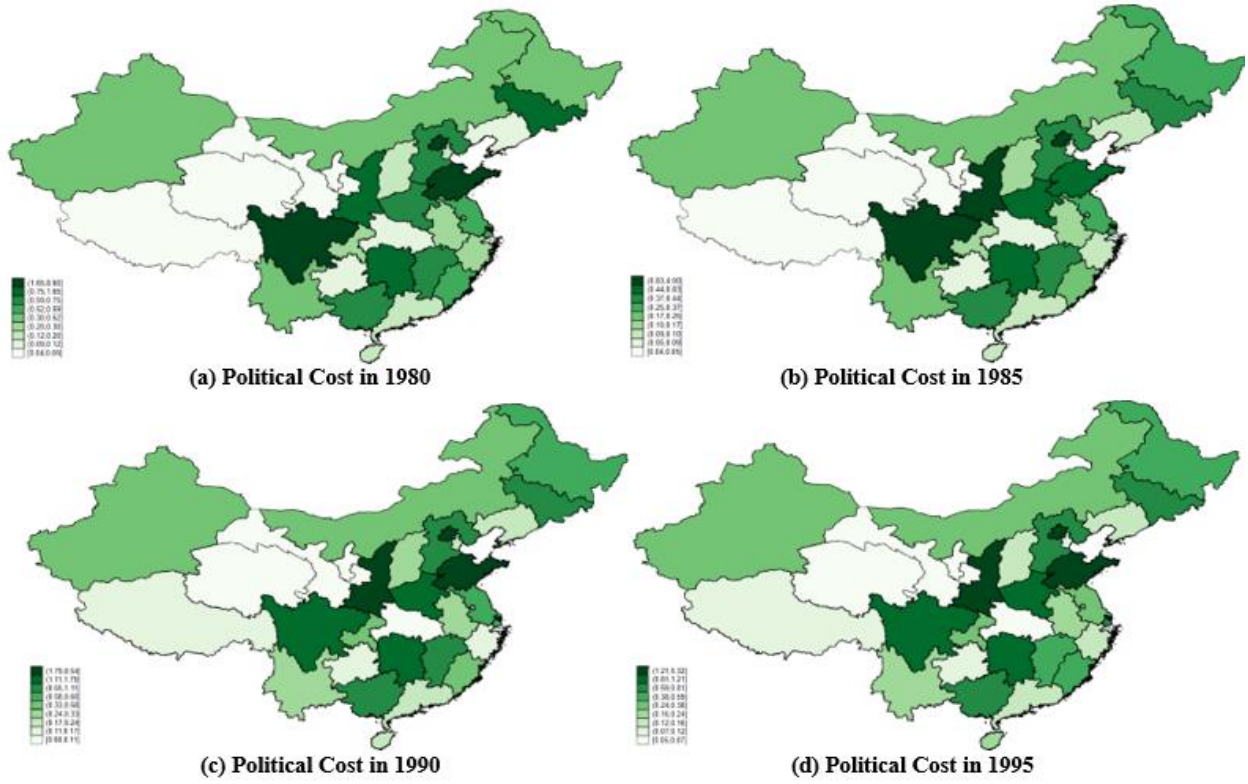


FIGURE A4. THE POLITICAL COST ACROSS MAINLAND CHINA OVER TIMES

Note: The heat maps visualize political costs in each province at different times: 1980, 1985, 1990, and 1995, showing geographical changes in political costs over time. Lighter colors correspond to lower political costs. The implementation of the "later-longer-fewer" campaign across Chinese provinces began in 1969 with Guangdong, followed by Shandong in 1970. In 1971, Shanxi, Zhejiang, Hubei, Hunan, Chongqing, Sichuan, Shaanxi, Gansu, and Hainan started the policy. By 1972, the list expanded to include Tianjin, Hebei, Inner Mongolia, Liaoning, Jilin, Heilongjiang, Anhui, Fujian, Jiangxi, Yunnan, and Ningxia. The following year, 1973, saw Beijing, Shanghai, Jiangsu, and Henan implementing the policy. In 1974, Guangxi and Qinghai joined. The last to adopt the policy in 1975 were Guizhou and Xinjiang.

TABLE A1. P-VALUES FOR CORRELATIONS OF FAMILY PLANNING POLICY VARIABLES WITH MACRO VARIABLES

Provincial-level variables	Fine rate			Political cost		
	1-year	2-year	3-year	1-year	2-year	3-year
Panel A: Demographic variables						
Population	0.575	0.618	0.662	0.842	0.835	0.821
Birth rate	0.112	0.199	0.284	0.407	0.351	0.305
Death rate	0.597	0.552	0.446	0.272	0.251	0.253
Panel B: Macroeconomic indexes						
GDP	0.269	0.109	0.738	0.529	0.402	0.292
Gini coefficient	0.769	0.983	0.877	0.920	0.526	0.987
Unemployment	0.633	0.491	0.666	0.811	0.895	0.657
Panel C: Government expenditure and social services						
Government expenditure share of GDP	0.906	0.994	0.897	0.369	0.440	0.384
Doctors in hospitals per capita	0.470	0.186	0.185	0.146	0.349	0.157
Panel D: Social and political environment						
Political environment (proxied by ratio of political elite in provincial	0.226	0.538	0.909	0.290	0.252	0.303
Son preference (proxied by the density of genealogy		0.653			0.527	

Note: We perform univariate regression of fine rates or political costs on the previous years' provincial-level variable and clustered the result by province. Data are sourced from the China Statistical Yearbook, China Medical Statistical Yearbook, China Educational Statistical Yearbook, and Comprehensive Catalog of Chinese Genealogy (cross-sectional data). The GDP, wage, government expenditure, and the number of doctors and teachers are first-differenced.

Table A2 Independence of political costs and fine rates

Dependent variables	Another treatment lag term, independent variable				
	1-year	2-year	3-year	4-year	5-year
Fine rate	0.248	0.916	0.767	0.835	0.655
Political cost	0.151	0.719	0.245	0.236	0.082

Note: We perform a regression of fine rates or political costs on the lagged provincial-level variable from the previous years. The table presents the P-values.

Appendix B. Statistical Summary

The final data set consists of 2,096,978 parent-child pairs, with children averaging 35.91 years old (Table A7). The birth years of the children range from 1949 to 1996 (Table A6), while the survey years span from 1986 to 2019 (Table A7). However, we conduct a robustness test using a set of subsamples, the results of which confirm the consistency of our findings (see Appendix C2).

Information on income is available for 540,313 child observations, 347,545 father observations, and 376,315 mother observations, with mean annual incomes of 123,792 *yuan*, 39,281 *yuan*, and 6,786 *yuan* (adjusted by CPI), respectively. Educational data is available for 2,086,168 child observations, 1,814,280 father observations, and 1,975,701 mother observations, with means of 7.93, 6.76, and 5.22 years of education, respectively. Social-class data is available for 551,242 child observations, 357,297 father observations, and 385,979 mother observations, with means of 0.56, 0.55, and 0.41, respectively.

TABLE B1. INFORMATION ON DATA SETS

Data set	Wave	Investigators	Obs. number in our sample
Chinese Household Finance Survey (CHFS)	2013, 2015, 2017	Southwestern University of Finance and Economics	98,931
China Family Panel Studies (CFPS)	2010, 2012, 2014, 2016, 2018	National Natural Science Foundation of China, Peking University	147,271
China Health and Retirement Longitudinal Study (CHARLS)	2011, 2013, 2015, 2018	National Natural Science Foundation of China, Peking University	170,062
China Health and Nutrition Study (CHNS)	1989, 1991, 1993, 1997, 2000, 2004, 2006, 2009, 2011, 2015	National Institute of Nutrition and Food Safety, China Center for Disease Control and Prevention, Carolina Population Center, the University of North Carolina at Chapel Hill	21,835
Chinese General Social Survey (CGSS)	2003, 2006, 2008, 2010, 2011, 2012, 2013, 2015	National Survey Research Center at Renmin University of China	51,669
National Population Census of China (NPCC) Long Form database	2000, 2005	National Bureau of Statistics of the People's Republic of China	1,393,367
Chinese Social Survey (CSS)	2006, 2008, 2011, 2013, 2015 2017	Institute of sociology, Chinese Academy of Social Sciences	23,547
Urban household survey (UHS)	Every year during 1986-2015	National Bureau of Statistics of the People's Republic of China	99,157
Chinese Household Income Project (CHIP)	1988, 1995, 1999, 2002, 2007, 2008 2013	Institute of economics, Chinese Academy of Social Sciences	53,954
China Labor-force Dynamics Survey (CLDS)	2012, 2014, 2016	Sun Yat-Sen University	37,185

Note: This table lists all the data sources used to create the main dataset.

TABLE B2. SUMMARY STATISTICS

Variables	Observations	Mean	Std. dev.	Min	Max
	(1)	(2)	(3)	(4)	(5)
Children:					
Gender: Male = 1	2,096,978	0.73	0.44	0	1
Age	2,096,978	35.91	10.27	23	69
Marriage status: Married and live together = 1	2,079,344	0.75	0.43	0	1
Income	540,313	123,792.4	1,111,588	0	20,000,000
Education years	2,086,168	7.93	3.75	0	22
Social class (0 = lowest, 4 = highest)	551,242	0.56	0.70	0	4
Only child = 1	1,972,725	0.11	0.31	0	1
Majority ethnicity = 1	1,941,590	0.91	0.29	0	1
Rural = 1	1,798,013	0.63	0.48	0	1
Born at Rural = 1	2,071,505	0.65	0.48	0	1
Parents:					
Father income	347,545	39,280.95	509,475.9	0	9,999,999
Mother income	376,315	6,786.21	203,48.82	0	6,300,000
Father education years	1,814,280	6.76	4.43	0	22
Mother education years	1,975,701	5.22	4.65	0	22
Father social class (0 = lowest, 4 = highest)	357,297	0.55	0.68	0	4
Mother social class (0 = lowest, 4 = highest)	385,979	0.41	0.56	0	4

Note: Data for our sample are compiled from ten sources, as detailed in Table B1.

TABLE B3. SAMPLE COUNTS BY BIRTH COHORT

Cohorts	Number of observations	Percent (%)	Cum. percent (%)
1949	22,140	1.06	1.06
1950	24,385	1.16	2.22
1951	25,264	1.20	3.42
1952	32,373	1.54	4.97
1953	30,903	1.47	6.44
1954	36,543	1.74	8.18
1955	37,036	1.77	9.95
1956	36,480	1.74	11.69
1957	42,515	2.03	13.72
1958	37,201	1.77	15.49
1959	31,345	1.49	16.99
1960	35,381	1.69	18.67
1961	29,580	1.41	20.08
1962	56,657	2.70	22.79
1963	74,485	3.55	26.34
1964	66,515	3.17	29.51
1965	68,172	3.25	32.76
1966	70,293	3.35	36.11
1967	67,836	3.23	39.35
1968	90,727	4.33	43.67
1969	86,117	4.11	47.78
1970	102,189	4.87	52.65
1971	103,291	4.93	57.58
1972	96,199	4.59	62.17
1973	91,131	4.35	66.51
1974	95,222	4.54	71.05
1975	88,872	4.24	75.29
1976	107,510	5.13	80.42
1977	108,181	5.16	85.58
1978	38,884	1.85	87.43
1979	37,256	1.78	89.21
1980	31,262	1.49	90.70
1981	31,742	1.51	92.21
1982	34,303	1.64	93.85
1983	16,525	0.79	94.64
1984	15,315	0.73	95.37
1985	14,992	0.71	96.08
1986	15,669	0.75	96.83
1987	15,362	0.73	97.56
1988	13,494	0.64	98.21
1989	11,888	0.57	98.77
1990	9,823	0.47	99.24
1991	5,755	0.27	99.52
1992	4,159	0.20	99.71
1993	2,770	0.13	99.85
1994	1,679	0.08	99.93
1995	1,434	0.07	99.99
1996	123	0.01	100.00
Total	2,096,978		

Note: The table shows the number of observations by each cohort in our main sample.

Appendix C. Robustness Checks and Supplementary Analyses

Appendix C1. Supplementary Figures and Tables

TABLE C1. THE DYNAMIC IMPACTS OF LATER-LONGER-FEWER" CAMPAIGN ON INTERGENERATIONAL PERSISTENCE

Years after LLF implementation	Income persistence			Educational persistence			Social class persistence		
	Mean	95% Confidential interval		Mean	95% Confidential interval		Mean	95% Confidential interval	
-5	-0.0332	-0.1222	0.0557	0.0101	-0.0709	0.0911	-0.0404	-0.1345	0.0537
-4	0.0055	-0.0600	0.0711	0.0131	-0.1601	0.1863	0.0712	-0.0382	0.1806
-3	-0.0175	-0.0711	0.0361	0.0313	-0.1514	0.2139	-0.0156	-0.1131	0.0819
-2	-0.0265	-0.0848	0.0317	0.0230	-0.0806	0.1266	-0.0386	-0.1142	0.0369
-1	0.0045	-0.0816	0.0905	0.0314	-0.0659	0.1287	0.0575	-0.0390	0.1540
0									
1	-0.0613	-0.1256	0.0030	-0.1000	-0.1958	-0.0041	-0.0973	-0.1810	-0.0136
2	-0.0780	-0.1354	-0.0205	-0.0824	-0.1789	0.0142	-0.1232	-0.1796	-0.0668
3	-0.1057	-0.1848	-0.0266	-0.0503	-0.1395	0.0389	-0.1370	-0.2329	-0.0410
4	-0.1044	-0.1760	-0.0328	-0.1146	-0.1964	-0.0328	-0.1142	-0.1637	-0.0647
5	-0.1320	-0.1978	-0.0662	-0.0781	-0.1669	0.0106	-0.1342	-0.2006	-0.0679
6	-0.1166	-0.1777	-0.0554	-0.1312	-0.2498	-0.0127	-0.1009	-0.1621	-0.0397
7	-0.1345	-0.2024	-0.0665	-0.1403	-0.2731	-0.0076	-0.1394	-0.2036	-0.0752
8	-0.1223	-0.1966	-0.0480	-0.0778	-0.1555	-0.0002	-0.1284	-0.1975	-0.0594
9	-0.1221	-0.1708	-0.0734	-0.0913	-0.1987	0.0162	-0.1352	-0.1944	-0.0760
10	-0.1563	-0.2292	-0.0834	-0.1214	-0.2296	-0.0132	-0.1478	-0.2346	-0.0610

Note: This table corresponds to Figure 1, showing the mean and the 95% confidence intervals of the dynamic effects of LLF sanctions on income, educational, and social class persistence.

TABLE C2. THE DYNAMIC IMPACTS OF ONE-CHILD POLICY FINES ON INTERGENERATIONAL PERSISTENCE

Years after LLF implementation	Income persistence			Educational persistence			Social class persistence		
	Mean	95% Confidential interval		Mean	95% Confidential interval		Mean	95% Confidential interval	
-5	-0.0261	-0.2504	0.1982	-0.0639	-0.2006	0.0727	0.0195	-0.2639	0.3028
-4	-0.0538	-0.1614	0.0538	-0.0980	-0.2532	0.0572	-0.1226	-0.3138	0.0685
-3	-0.0516	-0.1620	0.0587	-0.1276	-0.4254	0.1702	-0.0872	-0.2064	0.0320
-2	-0.0524	-0.2094	0.1047	-0.0605	-0.2232	0.1022	-0.0993	-0.2553	0.0568
-1	-0.0438	-0.1557	0.0680	-0.0518	-0.2012	0.0975	-0.0981	-0.2477	0.0515
0									
1	-0.2812	-0.4677	-0.0946	-0.2776	-0.5411	-0.0141	-0.2803	-0.4862	-0.0744
2	-0.2402	-0.4084	-0.0721	-0.3658	-0.5356	-0.1960	-0.1271	-0.3062	0.0521
3	-0.2970	-0.4835	-0.1104	-0.4314	-0.5690	-0.2937	-0.3028	-0.5181	-0.0874
4	-0.4662	-0.6866	-0.2458	-0.3242	-0.4911	-0.1572	-0.5037	-0.6914	-0.3161
5	-0.3065	-0.5242	-0.0888	-0.2468	-0.5525	0.0590	-0.3481	-0.5504	-0.1459

Note: This table corresponds to Figure 1, showing the mean and the 95% confidence intervals of the dynamic effects of LLF sanctions on income, educational, and social class persistence.

TABLE C3. EFFECT OF FAMILY PLANNING POLICIES ON RELATIVE PERSISTENCE: INCLUDING MIDDLE-FINE, MIDDLE-POLITICAL COST PROVINCES

	Income rank (1)	Educational rank (2)	Social class rank (3)	Income rank (4)	Educational rank (5)	Social class rank (6)
Rank	0.381***	0.486***	0.370***	0.418***	0.335***	0.356***
	(0.021)	(0.038)	(0.022)	(0.026)	(0.015)	(0.025)
Rank X High Fine	-0.133***	-0.165***	-0.122***	-0.133***	-0.072***	-0.118***
	(0.026)	(0.043)	(0.026)	(0.026)	(0.021)	(0.026)
Rank X High Political Cost	-0.111***	-0.166***	-0.181***	-0.121***	-0.082***	-0.120***
	(0.025)	(0.041)	(0.024)	(0.028)	(0.024)	(0.022)
Poor X Fine				-0.090***	-0.078***	-0.063**
				(0.020)	(0.021)	(0.026)
Political Elite X Political Cost				0.016	-0.008	-0.114***
				(0.047)	(0.017)	(0.025)
Province FE	X	X	X	X	X	X
Cohort FE	X	X	X	X	X	X
Mother Cohort FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Observations	371,166	1,234,670	375,190	371,166	397,634	371,653
R-squared	0.182	0.260	0.141	0.184	0.177	0.139

Note: Each cell presents the coefficient derived from estimating the impact of policy intensity—specifically, whether being born in a province with high fines or high political costs—on income, education, and social class persistence. The dependent variables are the ranks of children's income, education, and social class within their cohort. The primary independent variable is a dummy indicating whether the birth province belongs to the high-fine-rate or high- political cost group, interacting with their parents' corresponding rank within the parents' cohort. All regressions include controls for survey-year fixed effects (FE), birth province FE, cohort and mother cohort FE of both the individual and their parents. Robust standard errors are clustered at the provincial level. ***, **, and * indicate statistical significance at the levels of 1%, 5%, and 10%, respectively.

TABLE C4. ROBUSTNESS CHECKS, FOR DIFFERENT CLUSTERING METHODS

	Income rank (1)	Education rank (2)	Social class rank (3)
Rank X High fine, Baseline	-0.096***	-0.164**	-0.080**
	(0.027)	(0.063)	(0.028)
Rank X High fine, Clustered by province and data	-0.096***	-0.164**	-0.080**
	(0.024)	(0.065)	(0.026)
Rank X High Political Cost, Baseline	-0.087***	-0.163**	-0.157***
	(0.029)	(0.060)	(0.029)
Rank X High Political Cost, Clustered by province and data	-0.087***	-0.163**	-0.157***
	(0.026)	(0.061)	(0.027)

Note: This table reports the results of robustness checks using the primary clustering method and an alternative two-way clustering method by province and survey resources. Robust standard errors in the baseline analysis are clustered by province. Each cell reports the coefficient from an estimation of family planning intensity (fine or political costs) effect. ***, **, and * indicate statistical significance at the levels of 1%, 5%, and 10%, respectively.

TABLE C5. UPWARD EDUCATIONAL MOBILITY

	Children in quintile 1	Children in quintile 2	Children in quintile 3	Children in quintile 4	Children in quintile 5
	(1)	(2)	(3)	(4)	(5)
Parents in quintile 1	55.60	25.03	8.81	6.21	4.35
Difference H-L Fine	-7.91	-6.25	3.56	5.38	5.21
Difference H-L Political Cost	-16.11	3.74	5.37	5.55	1.45
Parents in quintile 2	23.31	64.47	6.39	2.94	2.90
Difference H-L Fine	2.29	-23.64	5.98	9.29	6.09
Difference H-L Political Cost	4.72	-24.99	8.85	7.99	3.44
Parents in quintile 3	24.74	43.27	12.13	12.00	7.86
Difference H-L Fine	-1.88	-12.16	1.04	10.91	2.09
Difference H-L Political Cost	-2.39	-6.52	0.14	7.42	1.34
Parents in quintile 4	13.39	15.14	10.89	48.82	11.76
Difference H-L Fine	1.51	3.54	3.76	-10.89	2.08
Difference H-L Political Cost	0.93	10.11	5.86	-20.26	3.36
Parents in quintile 5	5.96	14.68	4.80	43.53	31.02
Difference H-L Fine	3.34	-0.01	2.00	-0.89	-4.44
Difference H-L Political Cost	3.67	4.67	4.77	-10.56	-2.54

Note: Each cell reports the percentage of children that grew up in a given education quintile in their parents' education distribution who ended up in a specific education quintile in their own cohort's earnings distribution in the low-fine-rate, low-political-cost provinces, the difference in the percentage between high- and low-fine-rate provinces, or between high- and low-political-cost provinces. Children's education is ranked within their birth cohort's education distribution, and the parents' education is ranked within their own cohort's education distribution. We include those whose mothers have reproductive capability during the family planning period.

TABLE C6. UPWARD SOCIAL CLASS MOBILITY

	Children in quintile 1	Children in quintile 2	Children in quintile 3	Children in quintile 4	Children in quintile 5
	(1)	(2)	(3)	(4)	(5)
Parents in quintile 1	69.15	13.89	7.51	6.19	3.25
Difference H-L Fine	-1.01	-2.26	-0.36	2.27	1.36
Difference H-L Political Cost	-0.89	2.63	-0.47	-1.49	0.22
Parents in quintile 2	55.26	17.14	11.20	12.72	3.68
Difference H-L Fine	2.03	-7.27	1.33	4.83	-0.92
Difference H-L Political Cost	-0.79	1.69	0.28	-0.74	-0.44
Parents in quintile 3	47.00	18.79	10.58	15.11	8.52
Difference H-L Fine	2.51	-9.91	3.99	6.16	-2.75
Difference H-L Political Cost	1.35	-1.62	-1.30	2.58	-1.00
Parents in quintile 4	37.77	16.19	14.36	18.31	13.36
Difference H-L Fine	3.03	-4.27	7.52	-6.89	0.63
Difference H-L Political Cost	2.16	1.73	4.25	-9.86	1.72
Parents in quintile 5	28.73	11.99	9.32	20.36	29.59
Difference H-L Fine	7.55	-1.02	9.41	-5.35	-10.59
Difference H-L Political Cost	8.43	2.71	6.20	-5.73	-11.61

Note: Each cell reports the percentage of children that grew up in a given social class quintile in their parents' social class distribution who ended up in a specific social class quintile in their own cohort's earnings distribution in the low-fine-rate, low-political-cost provinces, the difference in the percentage between high- and low-fine-rate provinces, or between high- and low-political-cost provinces. Children's social class is ranked within their birth cohort's social class distribution, and the parents' social class is ranked within their own cohort's social class distribution. We include those whose mothers have reproductive capability during the family planning period.

TABLE C7. EFFECTS FROM PERMUTATION PLACEBO TEST VERSUS BASELINE EFFECTS

	Income rank (1)	Education rank (2)	Social class rank (3)
Rank X High fine, Baseline	-0.096***	-0.164**	-0.080**
	(0.027)	(0.063)	(0.028)
Rank X High fine, 95th percentile placebo	0.006	0.002	0.008
	(0.005)	(0.001)	(0.007)
Rank X High fine, 5th percentile placebo	-0.007	-0.001	-0.008
	(0.006)	(0.001)	(0.006)
Rank X High Political, Baseline	-0.087***	-0.163**	-0.157***
	(0.029)	(0.060)	(0.029)
Rank X High Political, 95th percentile placebo	0.005	0.001	0.005
	(0.004)	(0.001)	(0.005)
Rank X High Political, 5th percentile placebo	-0.006	-0.001	-0.007
	(0.003)	(0.001)	(0.003)

Note: This table presents the 95th and 5th percentile permutation coefficients from a permutation test that randomizes the treatment (fine rate or political cost variable) in the sample. The baseline effect is also shown here (same as Table 1). The permutation regression settings mirror the baseline regression. All regressions are controlled for survey year fixed effects (FE), province FE, dataset FE, and cohort FE. Robust standard errors are clustered by province in parentheses. ***, **, and * indicate statistical significance at the levels of 1%, 5%, and 10%, respectively.

TABLE C8. EFFECTS FROM PERMUTATION PLACEBO TEST VERSUS BASELINE EFFECTS, HETEROGENEITY TREATMENT TEST

	Income rank (1)	Education rank (2)	Social class rank (3)
Rank X High fine, Baseline	-0.096***	-0.164**	-0.080**
	(0.027)	(0.063)	(0.028)
Random group X Rank X High fine, 95th percentile placebo	0.006	0.002	0.008
	(0.005)	(0.001)	(0.007)
Random group X Rank X High fine, 5th percentile placebo	-0.007	-0.001	-0.008
	(0.006)	(0.001)	(0.006)
Rank X High Political, Baseline	-0.087***	-0.163**	-0.157***
	(0.029)	(0.060)	(0.029)
Random group X Rank X High Political, 95th percentile placebo	0.005	0.001	0.005
	(0.004)	(0.001)	(0.005)
Random group X Rank X High Political, 5th percentile placebo	-0.006	-0.001	-0.007
	(0.003)	(0.001)	(0.003)

Note: This table reports the 95th percentile and 5th percentile permutation coefficients permutation test to randomize the post sample into two groups and test the difference, regressions with 100 draws. Each cell in this table reports the coefficient from an estimation of the policy intensity effect interacting with random groups on income or education or social class. The dependent variable is the rank of children's income or education or social class in their cohort. All regressions are controlled for survey-year fixed effects (FE), province FE, mother Cohort FE, and cohort FE. Robust standard errors are in parentheses and clustered by province. ***, **, and * indicate statistical significance at the levels of 1%, 5%, and 10%, respectively.

TABLE C9. P-VALUES FOR CORRELATIONS OF THE AGE OF PROVINCE COMMITTEE WITH MACROECONOMIC INDICES

Provincial-level variables	Age of Provincial Governors			Age of Provincial Party Secretaries		
	1-year	2-year	3-year	1-year	2-year	3-year
Panel A: Demographic variables						
Population	0.800	0.844	0.655	0.432	0.462	0.484
Birth rate	0.170	0.167	0.163	0.710	0.614	0.615
Moving-out population	0.290	0.307	0.318	0.088	0.205	0.110
Panel B: Macroeconomic indexes						
Gini Coefficient	0.218	0.247	0.248	0.355	0.290	0.288
Wage	0.121	0.801	0.150	0.246	0.203	0.085
Panel C: Government expenditure and social						
Government expenditure share of GDP	0.311	0.784	0.519	0.934	0.785	0.720
Doctors in hospitals per capita	0.815	0.591	0.585	0.701	0.200	0.455
Teachers in schools per capita	0.586	0.676	0.209	0.475	0.113	0.992

Note: We conduct univariate regressions of provincial-level variables on the age of the provincial governor or party secretary from the previous years, clustering the results by province. The goal was to assess whether the age of these officials had any significant predictive power over these macroeconomic variables. Data are sourced from the China Statistical Yearbook, China Medical Statistical Yearbook, China Educational Statistical Yearbook, and Comprehensive Catalog of Chinese Genealogy. The GDP, wage, government expenditure, and the number of doctors and teachers are first-differenced.

TABLE C10. FAMILY PLANNING POLICY EFFECT ON RELATIVE PERSISTENCE, IV ESTIMATION

	Child's income rank, OLS (1)	Child's income rank, IV (2)	Child's education rank, OLS (3)	Child's education rank, IV (4)	Child's social class rank, OLS (5)	Child's social class rank, IV (6)
High fine X rank	-0.096***	-0.128**	-0.164**	-0.188**	-0.080**	-0.224***
	(0.027)	(0.062)	(0.063)	(0.075)	(0.028)	(0.057)
High political X rank	-0.087***	-0.096*	-0.163**	-0.118*	-0.157***	-0.308***
	(0.029)	(0.058)	(0.060)	(0.061)	(0.029)	(0.057)
Province FE	X	X	X	X	X	X
Cohort FE	X	X	X	X	X	X
Mother Cohort FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
K-P F Statistic	-	46.439	-	11.168	-	11.290
Observations	227,116	227,116	781,995	781,995	229,666	229,666
R-squared	0.149	0.131	0.246	0.245	0.111	0.104

Note: Each column reports the coefficient from an OLS or IV estimation of the family policy intensity effect (measured by fine rates or political costs). The dependent variables are the ranks of children's income, education, and social class within their cohort. Key independent variables are the fine rate and political costs at the province-year level, interacting with their parents' corresponding rank within the parents' cohort. Columns (1), (3), and (5) show OLS results, while columns (2), (4), and (6) present IV results using the average age of the provincial government committee as an instrumental variable. All regressions are controlled for survey-year fixed effects (FE), province FE, mother Cohort FE, and cohort FE. Robust standard errors are in parentheses and clustered by province. ***, **, and * indicate statistical significance at the levels of 1%, 5%, and 10%, respectively.

Appendix C2. Additional Details on Robustness Checks

To investigate the impact of educational policies on intergenerational persistence, we use China's university reenrollment and enrollment expansions as a proxy measure. These reforms, implemented in 1977, have had a significant influence on university demographics and may be associated with intergenerational mobility.

To test this hypothesis, we employ the provincial university enrollment rates of corresponding cohorts as an indicator of current educational policy. We include the interaction between enrollment rate and parent rank as a control variable to examine if the policy effect on intergenerational persistence remains significant when accounting for contemporary educational policies.

Our findings, presented in Table C11, demonstrate that contemporary educational policies impact intergenerational mobility. However, it is noteworthy that the key coefficients of the OCP and parent rank remain significant and consistent with our baseline results. This suggests that the impact of the OCP on intergenerational persistence is not diminished by contemporary educational policies. Both the OCP and the expansion of college reenrollment and enrollment opportunities contribute to intergenerational mobility dynamics, with the former mitigating opportunity concentration and the latter providing access to a wider pool of ambitious and talented individuals.

In one test, we utilize the father's rank as an indicator of the rank status of both parents, considering the prevailing male-breadwinning family norms in Chinese society (Table C12).

Additionally, we conduct regressions with datasets that offer detailed information on coresidents. Given that male offspring in China are more likely than females to reside with their parents, and primary respondents of a household typically provide more comprehensive information on coresidents, we address this issue in surveys such as the national census, Chinese General Social Survey, Chinese Household Income Project, and Urban Household Survey. Other national surveys in our study mitigate the problem of missing coresident data by including questions on all family members, regardless of coresidency. Evaluating the impact of coresidency, we establish a subsample that excludes information from these potentially confounded data sources. Our main findings, consistent with the baseline results, remain largely unaffected by coresidency (Table C13).

Finally, we reweigh our models by the sample size of each cohort, assuming an equal contribution of every cohort to estimate the average treatment effect of the OCP. The results

consistently align with the baseline findings (Table C14).

TABLE C11. ALTERNATIVE INTERPRETATIONS: REINSTITUTION OF THE COLLEGE ENTRANCE EXAMINATION AND UNIVERSITY ENROLLMENT EXPANSIONS

	Income rank	Education rank	Social class rank
	(1)	(2)	(3)
Rank X High fine	-0.099***	-0.161**	-0.082***
	(0.027)	(0.062)	(0.028)
Rank X High Political	-0.084***	-0.163**	-0.152***
	(0.027)	(0.060)	(0.027)
Rank X Reinstitution of the college entrance examination and university enrollment expansions	-0.649***	-0.365***	-0.697***
	(0.040)	(0.073)	(0.061)
Province FE	X	X	X
Cohort FE	X	X	X
Mother Cohort FE	X	X	X
Year FE	X	X	X
Observations	227,116	781,995	229,666
R-squared	0.167	0.250	0.128

Note: Each cell presents the coefficient derived from estimating the impact of policy intensity—specifically, whether being born in a province with high fines or high political costs—on income, education, and social class persistence. The dependent variables are the ranks of children's income, education, and social class within their cohort. The primary independent variable is a dummy indicating whether the birth province belongs to the high-fine-rate or high- political cost group, interacting with their parents' corresponding rank within the parents' cohort. We introduce the college entrance examination policy as a new policy to see its confounding effects. All regressions include controls for survey-year fixed effects (FE), birth province FE, cohort and mother cohort FE. Robust standard errors are clustered at the provincial level. ***, **, and * indicate statistical significance at the levels of 1%, 5%, and 10%, respectively.

TABLE C12. EFFECT OF FAMILY PLANNING POLICIES ON RELATIVE PERSISTENCE FATHER

	Income rank	Income rank	Educational rank	Educational rank	Social class rank	Social class rank
	(1)	(2)	(3)	(4)	(5)	(6)
Rank	0.381***	0.507***	0.363***	0.401***	0.336***	0.344***
	(0.035)	(0.066)	(0.036)	(0.037)	(0.027)	(0.039)
Rank X High fine	-0.089**	-0.158**	-0.068**	-0.088**	-0.084**	-0.063*
	(0.031)	(0.064)	(0.032)	(0.031)	(0.030)	(0.032)
Rank X High Political Cost	-0.091**	-0.173**	-0.158***	-0.104**	-0.083**	-0.101***
	(0.033)	(0.064)	(0.033)	(0.038)	(0.031)	(0.035)
Poor X Fine				-0.059	-0.049**	-0.064
				(0.041)	(0.021)	(0.044)
Political Elite X Political Cost				0.022	-0.025	-0.108***
				(0.048)	(0.018)	(0.027)
Province FE	X	X	X	X	X	X
Cohort FE	X	X	X	X	X	X
Mother Cohort FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Observations	197,726	682,436	200,139	197,726	229,532	197,907
R-squared	0.176	0.269	0.130	0.178	0.174	0.128

Note: Each cell presents the coefficient derived from estimating the impact of policy intensity—specifically, whether being born in a province with high fines or high political costs—on income, education, and social class persistence. The dependent variables are the ranks of children's income, education, and social class within their cohort. The primary independent variable is a dummy indicating whether the birth province belongs to the high-fine-rate or high- political cost group, interacting with their parents' corresponding rank within the parents' cohort. The parents' rank is the father's rank within his cohort in income, education, or social class. All regressions include controls for survey-year fixed effects (FE), birth province FE, cohort and mother cohort FE. Robust standard errors are clustered at the provincial level. ***, **, and * indicate statistical significance at the levels of 1%, 5%, and 10%, respectively.

TABLE C13. EFFECT OF FAMILY PLANNING POLICIES ON RELATIVE PERSISTENCE CO-RESIDENCY

	Income rank	Educational rank	Social class rank	Income rank	Educational rank	Social class rank
	(1)	(2)	(3)	(4)	(5)	(6)
Rank	0.395***	0.376***	0.401***	0.438***	0.378***	0.416***
	(0.044)	(0.030)	(0.043)	(0.044)	(0.032)	(0.045)
Rank X High fine	-0.093*	-0.165***	-0.094*	-0.086*	-0.046	-0.081
	(0.049)	(0.041)	(0.048)	(0.048)	(0.047)	(0.047)
Rank X High Political Cost	-0.100**	-0.074*	-0.194***	-0.100*	-0.106**	-0.109**
	(0.046)	(0.037)	(0.045)	(0.048)	(0.039)	(0.046)
Poor X Fine				-0.075**	-0.088***	-0.069**
				(0.035)	(0.025)	(0.033)
Political Elite X Political Cost				0.001	-0.024	-0.158***
				(0.030)	(0.019)	(0.023)
Province FE	X	X	X	X	X	X
Cohort FE	X	X	X	X	X	X
Mother Cohort FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Observations	134,893	245,339	137,405	134,893	152,038	135,160
R-squared	0.207	0.179	0.137	0.199	0.167	0.133

Note: Each cell presents the coefficient derived from estimating the impact of policy intensity—specifically, whether being born in a province with high fines or high political costs—on income, education, and social class persistence. The dependent variables are the ranks of children's income, education, and social class within their cohort. The primary independent variable is a dummy indicating whether the birth province belongs to the high-fine-rate or high- political cost group, interacting with their parents' corresponding rank within the parents' cohort. The sample consists of data sources that have addressed the co-residency issue. All regressions include controls for survey-year fixed effects (FE), birth province FE, cohort and mother cohort FE. Robust standard errors are clustered at the provincial level. ***, **, and * indicate statistical significance at the levels of 1%, 5%, and 10%, respectively.

TABLE C14. EFFECT OF FAMILY PLANNING POLICIES ON RELATIVE PERSISTENCE REWEIGHT

	Income rank	Educational rank	Social class rank	Income rank	Educational rank	Social class rank
	(1)	(2)	(3)	(4)	(5)	(6)
Rank	0.392***	0.492***	0.389***	0.440***	0.352***	0.377***
	(0.032)	(0.072)	(0.034)	(0.035)	(0.029)	(0.037)
Rank X High fine	-0.108***	-0.152*	-0.093**	-0.113***	-0.065**	-0.089**
	(0.029)	(0.072)	(0.033)	(0.030)	(0.025)	(0.034)
Rank X High Political Cost	-0.107***	-0.161**	-0.170***	-0.120***	-0.075**	-0.113***
	(0.031)	(0.070)	(0.031)	(0.040)	(0.029)	(0.038)
Poor X Fine				-0.094***	-0.071***	-0.083**
				(0.028)	(0.019)	(0.032)
Political Elite X Political Cost				0.019	-0.012	-0.108***
				(0.048)	(0.020)	(0.032)
Province FE	X	X	X	X	X	X
Cohort FE	X	X	X	X	X	X
Mother Cohort FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Observations	227,116	781,995	229,666	227,116	244,514	227,422
R-squared	0.160	0.274	0.127	0.163	0.185	0.125

Note: Each cell presents the coefficient derived from estimating the impact of policy intensity—specifically, whether being born in a province with high fines or high political costs—on income, education, and social class persistence. The dependent variables are the ranks of children's income, education, and social class within their cohort. The primary independent variable is a dummy indicating whether the birth province belongs to the high-fine-rate or high- political cost group, interacting with their parents' corresponding rank within the parents' cohort. Each sample is weighted according to the proportion of observations from each data source to ensure accurate representation and analysis. All regressions include controls for survey-year fixed effects (FE), birth province FE, cohort and mother cohort FE. Robust standard errors are clustered at the provincial level. ***, **, and * indicate statistical significance at the levels of 1%, 5%, and 10%, respectively.

Appendix D Additional Empirical Analysis and Supporting Materials—Channel Related

Appendix D1. Pre-Trend Analysis of Fertility

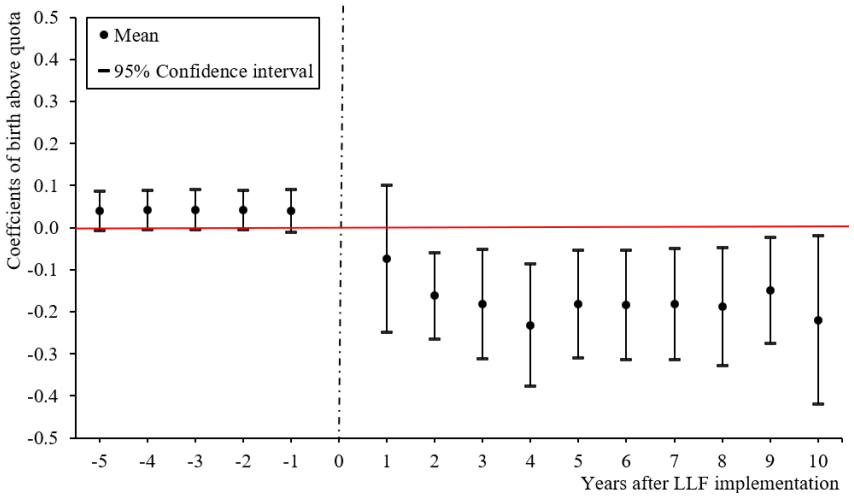


FIGURE D1. THE DYNAMIC IMPACTS OF FAMILY PLANNING POLICIES ON UNAUTHORIZED BIRTHS

Note: The figure illustrates the dynamic impacts of fines for unauthorized births over a timeline that spans five years before and ten years after the "later-longer-fewer" campaign (the standard is based on mothers' cohorts). The solid line represents the estimated coefficients, while the dashed lines denote the 95% confidence intervals, with standard errors clustered at the provincial level.

TABLE D1. THE DYNAMIC IMPACT OF FAMILY PLANNING POLICY FINES ON UNAUTHORIZED BIRTHS

Years after LLF implementation	Above quota birth		
	Mean	95% Confidential interval	
-5	0.0397	-0.0069	0.0864
-4	0.0409	-0.0058	0.0876
-3	0.0424	-0.0051	0.0900
-2	0.0411	-0.0055	0.0876
-1	0.0396	-0.0105	0.0897
0			
1	-0.0740	-0.2487	0.1008
2	-0.1623	-0.2642	-0.0605
3	-0.1818	-0.3114	-0.0522
4	-0.2315	-0.3773	-0.0857
5	-0.1815	-0.3101	-0.0530
6	-0.1830	-0.3128	-0.0531
7	-0.1818	-0.3144	-0.0492
8	-0.1880	-0.3277	-0.0483
9	-0.1492	-0.2747	-0.0238
10	-0.2195	-0.4195	-0.0195

Note: This table corresponds to Figure D1, showing the mean and the 95% confidence intervals of the dynamic effects of the "later-longer-fewer" campaign sanctions on unauthorized births.

Appendix D2. The resource concentration effect using triple-difference regressions on children from different income levels

We use the following equation to examine the impact of the OCP on nonfinancial benefits of children from the lower-income families:

(D1) $Outcomes_{iht} = \beta_p Poor_{ift} + \beta_f high_fine_b + \beta \times high_fine_b \times Poor_{ift} + G_i + \tau_t + \lambda_b + \omega_h + \delta_H + \varphi_d + \varepsilon_{iht}$

where $Poor_{ift}$ is a dummy variable indicating lower-income status, and the remaining variables are consistent with baseline regression. $high_fine_b$ is a dummy variable indicating if the child was born in a high-fine-rate province, We also include fixed effects for year (τ_t), birth province (λ_b), the child's birth cohort (ω_h), and the mother's birth cohort (δ_H) to capture time-invariant differences and changes over time. ε_{iht} is the error term clustered at the province of the child's birth to control for provincial-level shocks.

Appendix D3. Upward mobility by ranking children from political elite and non-elite families

TABLE D2. UPWARD INCOME MOBILITY – NON ELITE FAMILIES

	Children in quintile 1	Children in quintile 2	Children in quintile 3	Children in quintile 4	Children in quintile 5
	(1)	(2)	(3)	(4)	(5)
Parents in quintile 1	52.70	14.17	14.88	12.11	6.14
Difference H-L Fine	-3.52	1.03	-0.53	0.12	2.90
Difference H-L Political Cost	-6.75	6.07	-0.04	0.12	0.61
Parents in quintile 2	27.82	19.47	22.65	21.57	8.49
Difference H-L Fine	1.73	-2.24	4.85	-2.55	-1.79
Difference H-L Political Cost	-7.55	4.29	4.52	-0.81	-0.45
Parents in quintile 3	24.43	18.60	22.12	18.16	16.69
Difference H-L Fine	3.48	-0.56	-7.10	7.84	-3.66
Difference H-L Political Cost	-6.07	6.07	-3.09	6.00	-2.91
Parents in quintile 4	16.35	17.37	24.35	26.57	15.35
Difference H-L Fine	2.70	-0.85	0.23	-4.46	2.38
Difference H-L Political Cost	-1.23	3.94	2.56	-2.68	-2.59
Parents in quintile 5	12.92	10.28	16.88	31.69	28.23
Difference H-L Fine	3.35	2.84	6.21	-3.04	-9.36
Difference H-L Political Cost	1.46	6.08	5.75	-3.21	-10.08

Note: Each cell reports the percentage of children that grew up in a given income quintile in their parents' income distribution who ended up in a specific income quintile in their own cohort's earnings distribution in the low-fine-rate, low-political-cost provinces, the difference in the percentage between high- and low-fine-rate provinces, or between high- and low-political-cost provinces. Children's income is ranked within their birth cohort's income distribution, and the parents' income is ranked within their own cohort's income distribution. We include those whose mothers have reproductive capability during the family planning period.

TABLE D3. UPWARD INCOME MOBILITY – ELITE FAMILIES

	Children in quintile 1	Children in quintile 2	Children in quintile 3	Children in quintile 4	Children in quintile 5
	(1)	(2)	(3)	(4)	(5)
Parents in quintile 1	39.57	26.98	25.54	7.19	0.72
Difference H-L Fine	6.81	-3.70	-13.13	4.45	5.58
Difference H-L Political Cost	1.80	-0.59	-8.56	2.65	4.70
Parents in quintile 2	28.90	19.75	20.65	22.22	8.48
Difference H-L Fine	6.99	-2.06	2.25	-1.14	-6.03
Difference H-L Political Cost	2.92	-1.45	2.23	-0.61	-3.09
Parents in quintile 3	24.41	18.17	22.05	18.49	16.88
Difference H-L Fine	6.09	-1.81	-3.26	5.62	-6.64
Difference H-L Political Cost	2.75	-0.54	0.02	2.66	-4.89
Parents in quintile 4	15.90	17.28	24.51	27.43	14.87
Difference H-L Fine	1.04	-4.15	-3.96	1.68	5.38
Difference H-L Political Cost	3.18	-0.81	0.48	0.34	-3.18
Parents in quintile 5	14.58	10.12	15.57	24.33	35.40
Difference H-L Fine	1.32	-1.06	0.57	3.68	-4.51
Difference H-L Political Cost	3.24	1.56	4.19	6.25	-15.25

Note: Each cell reports the percentage of children that grew up in a given income quintile in their parents' income distribution who ended up in a specific income quintile in their own cohort's earnings distribution in the low-fine-rate, low-political-cost provinces, the difference in the percentage between high- and low-fine-rate provinces, or between high- and low-political-cost provinces. Children's income is ranked within their birth cohort's income distribution, and the parents' income is ranked within their own cohort's income distribution. We include those whose mothers have reproductive capability during the family planning period.

TABLE D4. UPWARD EDUCATIONAL MOBILITY– NON ELITE FAMILIES

	Children in quintile 1	Children in quintile 2	Children in quintile 3	Children in quintile 4	Children in quintile 5
	(1)	(2)	(3)	(4)	(5)
Parents in quintile 1	62.45	18.47	9.30	5.72	4.05
Difference H-L Fine	-25.94	8.69	3.25	5.53	8.47
Difference H-L Political Cost	-23.36	10.30	4.01	4.75	4.29
Parents in quintile 2	29.20	47.43	17.65	2.32	3.40
Difference H-L Fine	-2.53	-9.61	-2.55	6.00	8.68
Difference H-L Political Cost	-3.03	-5.45	-2.31	3.82	6.97
Parents in quintile 3	17.35	56.63	12.29	5.44	8.30
Difference H-L Fine	2.78	-22.05	-0.36	13.78	5.85
Difference H-L Political Cost	1.68	-15.38	-0.81	9.74	4.77
Parents in quintile 4	9.52	20.06	9.35	26.50	34.57
Difference H-L Fine	3.45	0.43	3.27	8.72	-15.86
Difference H-L Political Cost	4.71	6.88	3.25	0.81	-15.66
Parents in quintile 5	4.92	17.99	4.82	36.60	35.67
Difference H-L Fine	3.32	-1.67	2.90	-9.62	5.06
Difference H-L Political Cost	4.10	3.47	3.51	-13.07	1.99

Note: Each cell reports the percentage of children that grew up in a given education quintile in their parents' education distribution who ended up in a specific education quintile in their own cohort's earnings distribution in the low-fine-rate, low-political-cost provinces, the difference in the percentage between high- and low-fine-rate provinces, or between high- and low-political-cost provinces. Children's education is ranked within their birth cohort's education distribution, and the parents' education is ranked within their own cohort's education distribution. We include those whose mothers have reproductive capability during the family planning period.

TABLE D5. UPWARD EDUCATIONAL MOBILITY– ELITE FAMILIES

	Children in quintile 1	Children in quintile 2	Children in quintile 3	Children in quintile 4	Children in quintile 5
	(1)	(2)	(3)	(4)	(5)
Parents in quintile 1	33.78	23.55	20.59	10.39	11.70
Difference H-L Fine	-1.94	-3.74	-1.08	3.95	2.81
Difference H-L Political Cost	-2.56	-4.87	-0.12	3.22	4.33
Parents in quintile 2	30.42	26.11	20.10	14.42	8.95
Difference H-L Fine	-2.96	-1.05	0.99	0.74	2.28
Difference H-L Political Cost	-2.88	-2.68	0.12	2.93	2.50
Parents in quintile 3	21.74	21.00	23.58	21.30	12.38
Difference H-L Fine	0.06	1.11	0.02	-0.83	-0.37
Difference H-L Political Cost	-0.53	-1.20	-1.46	2.17	1.02
Parents in quintile 4	14.07	12.20	22.32	32.74	18.67
Difference H-L Fine	1.15	6.35	3.93	-7.45	-3.97
Difference H-L Political Cost	0.44	3.81	-0.09	-0.95	-3.20
Parents in quintile 5	9.27	8.62	11.97	20.46	49.68
Difference H-L Fine	1.58	2.69	7.44	6.06	-17.78
Difference H-L Political Cost	1.14	2.67	4.34	10.81	-18.96

Note: Each cell reports the percentage of children that grew up in a given education quintile in their parents' education distribution who ended up in a specific education quintile in their own cohort's earnings distribution in the low-fine-rate, low-political-cost provinces, the difference in the percentage between high- and low-fine-rate provinces, or between high- and low-political-cost provinces. Children's education is ranked within their birth cohort's education distribution, and the parents' education is ranked within their own cohort's education distribution. We include those whose mothers have reproductive capability during the family planning period.

TABLE D6. UPWARD SOCIAL CLASS MOBILITY – NON ELITE FAMILIES

	Children in quintile 1	Children in quintile 2	Children in quintile 3	Children in quintile 4	Children in quintile 5
	(1)	(2)	(3)	(4)	(5)
Parents in quintile 1	72.05	12.80	6.97	4.24	3.94
Difference H-L Fine	0.68	-4.21	-0.65	2.29	1.89
Difference H-L Political Cost	0.39	-1.03	0.19	0.26	0.19
Parents in quintile 2	59.98	15.44	8.06	12.11	4.41
Difference H-L Fine	2.20	-7.03	1.94	3.85	-0.96
Difference H-L Political Cost	0.09	-0.65	2.56	-1.11	-0.89
Parents in quintile 3	44.99	22.24	9.14	14.36	9.28
Difference H-L Fine	7.80	-14.25	5.71	5.98	-5.24
Difference H-L Political Cost	5.12	-5.72	4.52	-0.34	-3.58
Parents in quintile 4	37.74	22.82	9.77	17.38	12.29
Difference H-L Fine	8.24	-10.55	11.22	2.11	-11.02
Difference H-L Political Cost	8.27	-5.80	6.99	-2.23	-7.23
Parents in quintile 5	29.07	17.93	8.58	8.45	35.98
Difference H-L Fine	14.60	-6.84	7.69	20.33	-35.78
Difference H-L Political Cost	12.26	-1.90	6.29	7.89	-24.55

Note: Each cell reports the percentage of children that grew up in a given social class quintile in their parents' social class distribution who ended up in a specific social class quintile in their own cohort's earnings distribution in the low-fine-rate, low-political-cost provinces, the difference in the percentage between high- and low-fine-rate provinces, or between high- and low-political-cost provinces. Children's social class is ranked within their birth cohort's social class distribution, and the parents' social class is ranked within their own cohort's social class distribution. We include those whose mothers have reproductive capability during the family planning period.

TABLE D7. UPWARD SOCIAL CLASS MOBILITY– ELITE FAMILIES

	Children in quintile 1	Children in quintile 2	Children in quintile 3	Children in quintile 4	Children in quintile 5
	(1)	(2)	(3)	(4)	(5)
Parents in quintile 1	73.94	11.61	6.05	6.84	1.56
Difference H-L Fine	-4.36	-4.69	3.44	5.46	0.15
Difference H-L Political Cost	-1.07	-2.23	3.12	0.88	-0.70
Parents in quintile 2	58.03	16.95	9.70	10.16	5.17
Difference H-L Fine	-0.47	-7.57	4.68	5.96	-2.60
Difference H-L Political Cost	3.42	-4.77	4.98	0.63	-4.26
Parents in quintile 3	53.39	15.60	10.32	13.57	7.12
Difference H-L Fine	-2.01	-4.24	5.90	3.43	-3.08
Difference H-L Political Cost	6.08	-3.72	6.84	-3.17	-6.03
Parents in quintile 4	39.11	15.52	12.58	15.30	17.48
Difference H-L Fine	3.33	-1.87	6.74	1.29	-9.50
Difference H-L Political Cost	12.58	-2.17	12.52	-6.59	-16.35
Parents in quintile 5	33.18	11.45	8.18	7.48	39.72
Difference H-L Fine	2.41	1.56	11.34	8.72	-24.04
Difference H-L Political Cost	13.83	1.01	22.29	0.90	-38.03

Note: Each cell reports the percentage of children that grew up in a given social class quintile in their parents' social class distribution who ended up in a specific social class quintile in their own cohort's earnings distribution in the low-fine-rate, low-political-cost provinces, the difference in the percentage between high- and low-fine-rate provinces, or between high- and low-political-cost provinces. Children's social class is ranked within their birth cohort's social class distribution, and the parents' social class is ranked within their own cohort's social class distribution. We include those whose mothers have reproductive capability during the family planning period.