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Window dressing in the public sector: Evidence from China's compulsory education promotion program ☆

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ABSTRACT

We analyze the window-dressing behavior of China's local governments throughout the 1990s, when they were required to fulfill compulsory education targets imposed by the central government. County officials faced severe negative career consequences if they failed to fulfill these targets. We found that county-level education expenditures increased progressively as the pre-specified inspection period drew near but decreased dramatically after the inspection. This phenomenon was interpreted as evidence of the window-dressing behavior of county governments. Further analysis suggests that local officials with longer tenure and who were thus closer to promotion evaluations tended to engage in more aggressively window-dressing. Window-dressing behavior generates real consequences for school-age teenagers: those exposed to local governments' window-dressing behavior recorded considerably lower junior high school graduation rates and poorer labor market outcomes later in life.

1. Introduction

Window-dressing behavior has been well-documented in various organizations when an agent faces high-stakes incentives. In the corporate world, accountants may use creative methods to improve the appearance of financial statements, such as delaying supplier payments to create a higher period-end cash balance; bond managers usually manipulate their portfolio holdings to impress investors at certain high-stakes time nodes (e.g., Lakonishok et al., 1991; Agarwal et al., 2014). In the public sector, window dressing is widespread in both developed and developing countries. Bureaucrats may strategically pursue policy actions to appease voters or upper-level government officials. For example, there were accusations in the United Kingdom that small business support was "nothing but window-dressing";[1] moreover, according to policy observers, there was an accusation in India that the Union Interim Budget of 2019 was "fiscal window dressing" to appease the electorate.[2] In these instances, the agents (i.e., politicians) allocated expensive resources to influence the perceptions of their principals (i.e., voters or support bases in general). Window-dressing is different from data manipulation or cheating: window dressing frequently

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[1] Business Link: *Small business support is 'nothing but window dressing', says former Government advisor*, by Stuart Pearcey, May 15, 2019. https://www.runagood.com/press/small-business-support-is-nothing-but-window-dressing-says-former-government-advisor.

[2] The Hindu Business Line: *An exercise in fiscal window-dressing*, by RK Pattnaik, February 5, 2019. https://www.thehindubusinessline.com/opinion/fiscal-prudence-goes-for-a-toss/article26186225.ece. A similar media report about window dressing phenomenon in Thailand's public sector can be found in https://www.bangkokpost.com/thailand/politics/1702432/govt-reform-push-window-dressing.

induces resource allocation *across expenditure categories* and *over time* to cater to the principal *ex-ante*; once the incentives to window dress are absent, the resource allocation will revert.

The window-dressing phenomenon in the public sector has received scant systematic attention in the economic literature, despite the fact that it typically involves larger resource misallocations. In this paper, we examine local governments' strategic responses to China's Compulsory Education Promotion Program in the 1990s in order to provide an empirical analysis of window-dressing behavior in the public sector. The Chinese central government launched a nationwide program in 1992 as part of China's millennium pledges to achieve a nine-year compulsory education and eliminate illiteracy among young and middle-aged adults by the year 2000. To fulfill this ambitious goal, the central government imposed provincial sub-targets while the provinces in turn imposed county-level sub-targets. To assess whether a county achieved their targets, each county received specific targets on several key educational performance indicators, such as educational expenditures and junior high school enrollment rates, as well as a pre-specified deadline for target fulfillment, according to which it would be subject to a one-time inspection by the respective provincial government. A county that successfully completes the inspection process is awarded the status of certified compulsory education county (CCEC). In the 1990s, achieving compulsory education targets posed mounting financial challenges for most counties as elaborated later in this paper. In addition, local leaders who are authorized to allocate fiscal resources often lack incentives to invest in compulsory education because their career advancement is more closely linked to local economic growth than to local educational outcomes (Li and Zhou, 2005; Xu, 2011; Landry et al., 2018). To incentivize the fulfillment of the compulsory education targets, the provincial governments imposed strict rules, known as the "one-item veto," to discipline county leaders. According to these rules, county leaders who failed to accomplish the compulsory education targets by the deadlines would lose any opportunity for promotion for some time and could even be sacked. However, after a county had successfully passed the inspection, there was no extra reward for over-fulfillment; more importantly, once the inspection team awarded a county the CCEC, there would be no more inspections by upper-level governments. This institutional setting was ideal for studying the county leaders' window-dressing behavior, which consisted of mobilizing/reallocating resources to temporarily "meet" the targets before the deadline and then reversing the course after passing the inspection.[3]

We conducted a difference-in-differences analysis of county-level educational inputs before and after inspections by utilizing a unique dataset on the pre-specified scheduling of inspections for all Chinese counties from 1993 to 2001. For ease of interpretation, we define a period of three years—two years before the inspection and the inspection year itself—as the period of "preparation for meeting the targets" ("preparation"). The county-level educational expenditures gradually rose during the "preparation" period and peaked just before the inspection. However, post-inspection, the total educational expenditures decreased sharply and ended up being lower than they were before the "preparation" period. When we delved deeper into the composition of educational inputs, we found that extra-budgetary expenditures were primarily responsible for the aforementioned evolving pattern of total educational expenditures. In the 1990s, the majority of extra-budgetary expenditures were derived from fees and surcharges imposed on peasants and local enterprises, which were poorly monitored by upper-level authorities and were at the discretion of local governments. In contrast, budgetary education expenditures, which were more closely monitored, did not significantly increase during the "preparation" phase, although they declined sharply after the inspection.

Overall, these empirical results demonstrate a significant rise in educational expenditures prior to inspection, followed immediately by a steep decline after inspection. We interpret these findings as evidence that the local governments' window-dressing behavior was aimed at gaming the upper-level government.

For our window-dressing interpretation, we address two major competing hypotheses. The first alternative hypothesis contends that the decline in educational expenditure after the inspection was due to the natural contraction of one-off expenditures. There are two specific scenarios: first, some local governments may employ an "overshooting" strategy to ensure the achievement of the targets, and as a result, boost the educational performance to a level higher than that required to pass the inspection; second, local governments may need to construct school facilities to accommodate more students in order to achieve the educational targets; thus, when all the school facilities are constructed and the school enrollment target is fulfilled, the educational investment will naturally decrease. We argue that the interpretation of natural contraction contradicts our findings. First, we exploit China's 2005 population mini-census, which is immune to the manipulation of local governments, to assess the possibility that county leaders may adopt a conservative overshooting strategy to ensure the fulfillment of targets. Approximately 54% of the counties certified to have achieved the target rate of junior high school enrollment (i.e., 95%) in the inspection year did not do so. In other words, inspection teams were deceived by more than half of the counties. The fact that such a high proportion of counties fall short of a crucial target at the time of inspection suggests that overshooting is unlikely to drive our key results. Moreover, we find that the sharp decline in post-inspection educational expenditures is uncorrelated with whether the counties had actually reached the targets (based on the census data). Second, our outcome variables, namely annual educational expenditures, include only recurrent expenditures (e.g., teachers' wage bills) and exclude any one-time expenditures (e.g., building construction expenditures). Therefore, after inspection, they should be less exposed to natural contractions. Moreover, our empirical analysis suggests that the decline in junior high schools' educational expenditures was more pronounced in operation expenditures, which were relatively flexible to adjust, than for personnel expenditures (e.g., teachers' wage bills), which were naturally more inelastic. This evidence is more consistent with our window-dressing hypothesis than it is with the natural contraction of one-off expenditures.

The second alternative hypothesis states that the discrete changes in educational expenditures before and after the inspection may coincide with local political cycles, as local fiscal expenditures are highly correlated with the tenure of a local leader (Guo, 2009). To address this concern, we demonstrate that a county's pre-specified inspection time is uncorrelated with its party secretary or mayor's inauguration time, who has the final authority over how to allocate public resources under his/her jurisdiction. This evidence confirms the pre-determined nature of the inspection time set by provincial superiors and rules out the possibility that our findings are the consequence of local political cycles.

We further explore the heterogeneous effects of inspection on educational input. Our analysis demonstrates that, *ceteris paribus*, the disproportional decline in county educational expenditures after the inspection was more evident in counties with incumbent county leaders who had been in office for longer periods. In China's meritocracy-based political selection process, economic performance within local leaders' jurisdictions is a key performance indi-

[3] Historical narratives and our subsequent empirical evidence suggest that some counties might have cheated the inspectors and "passed" the inspection with a slightly lower standard. Nevertheless, these counties also engendered sizable resource reallocation to "pass" the inspection.

cator for evaluating the promotions by upper-level officials (Li and Zhou, 2005; Xu, 2011). During their tenure, promoting compulsory education would contribute little to the local economy in the short run. Furthermore, the average terms for a county party secretary and mayor during our sample period were approximately 3.5 years and 2.8 years, respectively. As they were closer to the time for promotion evaluation, local leaders who had been in their current positions for a longer period generally were subject to stronger career advancement incentives. Therefore, after the inspection, local leaders with longer tenures might reduce compulsory education expenditures more aggressively to divert more resources towards local economic development in order to maximize their chances of promotion.

Due to data limitations, our study is unable to provide a definitive welfare evaluation of the compulsory education promotion program or determine whether this program ultimately improved nationwide education advancement. However, because local governments' window-dressing behavior involves substantial reallocation of educational resources over time, we may investigate the distributional effects on cohorts who attended junior high school around the period of CCEC inspections. Using the individual-level data from China's 2005 population mini-census, we discovered that school-age teenagers attending junior high school after the inspection had a 2-percentage-point lower probability of graduating from junior high school. This observation was probably due to the post-inspection decrease in local educational expenditures. Further analysis reveals that, later in their lives, teenagers who were exposed to local governments' window-dressing behavior had a lower average monthly income than that of their counterparts who were not exposed to such behavior. Our findings indicate that local governments' window-dressing behavior cast long-lasting shadows on the later-life outcomes of the affected cohorts.

This study contributes to a variety of literature. Firstly, we contribute to the literature that examines the window-dressing behaviors of corporations and fund managers (e.g., Lakonishok et al., 1991; Allen and Saunders, 1992; Agarwal et al., 2014). To the best of our knowledge, this paper is one of the first empirical studies to evaluate window-dressing in the public sector.[4] Our paper not only provides evidence for the window-dressing behavior, namely a progressive increase in county-level educational expenditures as the high-stakes inspection time neared, followed by a dramatic decline soon after the inspection, but also quantifies the consequences of the window dressing behavior of local politicians on educational attainment and future labor earnings of millions of teenagers.

Secondly, this research is also closely related to the growing literature on how pre-specified targets or deadlines distort the efforts of agents in hierarchical organizations across time. Oyer (1998), in a seminal paper, explored the consequences of sales targets on the timing of revenues and contractual prices. Courty and Marschke (1997, 2004) investigate how local job training centers in the United States, in order to maximize their rewards, strategically reported their performance outcomes in the context of the *Job Training Partnership Act of 1982*. In reference to these initial studies, several scholars have explored the welfare implications of resource misallocation in various contexts. A study related to our paper is Liebman and Mahoney (2017), which demonstrate that budget expiration at the end of a fiscal year may incentivize the US federal government to urgently spend money on low-quality projects.[5] In our view, the phenomena studied in our paper and in Liebman and Mahoney (2017) have at least two important differences. First, the window dressing behavior in our paper is driven by the combination of three key factors, namely asymmetric information between the principal and the agent, multitasking agency, and the agents' cheating incentives to achieve the target; in contrast, Liebman and Mahoney (2017)'s finding of wasteful year-end spending of expiring budgets results from the "use-it-or-lose-it" feature of time-limited budget authority. Second, the window-dressing behavior documented in our paper is particularly relevant in a country like China where the higher authority often launches "campaign-style" programs by imposing targets on its subordinates and making evaluations of the latter based on the target fulfillment. The window-dressing behavior we document in this paper is an important contributor to *information loss* in non-democracies. The wasteful year-end spending in Liebman and Mahoney (2017), however, is primarily linked to specific budgeting rules and can happen in any political regimes.

Lastly, our study contributes to the political economy literature on upward accountability in authoritarian countries (Smith, 1991) and local accountability in developing countries (Bardhan and Mookherjee, 2000, 2005, 2006; Ferraz and Finan, 2011; Finan et al., 2017; Alatas et al., 2019). There is a large body of literature on how Chinese local leaders' political incentives distort the provision of local public goods, such as environmental protection (Chen et al., 2018; He et al., 2020; Greenstone et al., 2022), workplace safety regulations (Fisman and Wang, 2015, 2017; Shi and Xi, 2018), and city planning and land development (Wang et al., 2020). In contrast to these prior studies, which focus on distortions in a static multi-tasking context, such as the tradeoff between local economic development and environmental conservation, we examine distortions in a dynamic multi-tasking context. During the "preparation" period, our analysis shows that local officials who were facing fiscal pressure had to divert resources from elsewhere (e.g., levying surcharges on peasants and local enterprises) to "dress the window" (i.e., meet the educational targets); however, after the inspection, they quickly reversed their efforts. Broadly, the window-dressing behavior shown in this study is a common and natural response to China's prevalent *campaign-style* programs (Wang et al., 2022). The campaign-style programs, such as the compulsory education promotion program analyzed in this paper, are characterized by aggressive target setting, a relatively short timeframe for achieving targets, and top-down hierarchical imposition enforced by political discipline for lower-level officials. In the context of compulsory education, our study provides systematic evidence for the dynamic implications of politicians' behavior and the adverse effects of China's campaign-style programs.

The remainder of this paper is structured as follows. Section 2 covers the background of China's compulsory education promotion program. Section 3 describes the data. Section 4 unearths the local governments' window-dressing behavior on educational inputs, discusses two main alternative hypotheses, and investigates the heterogeneous effect of local leaders' underlying political career incentives. Section 5 examines the effects of the program on the junior high school graduation rates and later-life labor market outcomes of the affected cohorts to shed light on the potential redistribution implications of local governments' window-dressing behavior. Section 6 concludes.

2. China's compulsory education promotion program

2.1. Enactment and enforcement of compulsory education

Initially, low educational levels were recorded among the Chinese population. For instance, in 1982, only approximately one-

[4] A rather small theoretical literature, which spans several social science disciplines, has conducted preliminary analyses of the window dressing phenomenon in the public sector (e.g., Bischoff and Blaeschke, 2016).

[5] Similarly, according to Cao et al. (2023), loans granted by Chinese banks at the end of the year in order to meet loan targets are more likely to become non-performing loans.

third of Chinese adults had junior high school or above literacy.[6] Thus, China enacted *Compulsory Schooling Law* in 1986 to improve the educational attainment of its populace. According to this law, all Chinese citizens are required to complete nine years of compulsory education. However, despite the support of the national legislature, the mandatory compulsory schooling policy achieved limited progress in subsequent years. For instance, in 1990, the overall enrollment rates for primary and junior high schools were 97.8% and less than 70%, respectively; thus, China failed to meet the requirements of the compulsory schooling mandate, and the gap was huge in junior high school enrollment rates. There are at least two reasons for this slow progress. First, counties bore an overwhelming share of the financial responsibility for fulfilling compulsory schooling mandates. Many counties, especially those in China's interior regions, faced severe financial constraints due to their underdeveloped local economies in the late 1980s and the early 1990s. Second, local officials authorized to allocate fiscal funds cared more about local economic development than compulsory education as their promotion was closely linked to local economic performance, but not to improved educational outcomes (Li and Zhou, 2005; Xu, 2011). Therefore, local officials generally lack incentives to allocate scarce financial resources to compulsory education, which would bear fruit for the local economy in the long run but contribute little to local officials' promotion.

In 1992, the Chinese central government took a significant step to solve this issue. Jiang Zemin, the then-General Secretary of the Chinese Communist Party (CCP), solemnly proclaimed at the 14th National Congress of the CCP that China would achieve its goals of making nine-year compulsory education "generally accessible" and eliminating illiteracy among young and middle-aged adults by 2000.[7] This announcement conveyed two important messages to China's local officials: first, that fulfilling compulsory schooling was now a mandatory requirement for local governments because the top leader of the CCP had already made a public commitment to both domestic and international communities; and second, that the implementation of compulsory education would now adhere to a strict schedule. Immediately after Jiang's speech, the CCP Central Committee and the State Council issued a guideline titled *Chinese Educational Reform and Development Compendium* in 1993, followed by the Ministry of Education's detailed action plans. National goals were broken down into specific targets for each province, which were then broken down into targets for each county, along with a detailed timeline for enforcement and inspection. The Ministry of Education has also established a lucid package for specific performance targets for inspection. The key performance indicators consist of four main aspects.

1. The enrollment rate for primary school age children should be 100%, whereas that of junior high school age children should be greater than 95%.
2. Primary schools' dropout rate should be approximately 1%; the dropout rate of junior high schools should be below 2% and 3% in urban and rural areas, respectively.
3. The growth rate of fiscal education appropriations should exceed that of fiscal revenue. Personnel and operation education expenditures per pupil should increase annually and meet the minimum standards set by the provincial government.
4. Educational facilities and teachers' quality should reach the minimum standards set by the provincial government.

A county that fulfills these requirements would be awarded the status of a certified compulsory education county (CCEC). To avoid potential fraud and data manipulation by county governments, the central government mandated a procedure of inspection and appraisal to monitor and check target fulfillment. The procedure involved the following steps: First, once ready for the CCEC inspection, the county government applied for superiors' inspection before the deadline pre-specified by the provincial government. Next, the provincial government sent a team of inspectors on-site to verify whether the county was qualified to be awarded a CCEC certificate. Upon verification, the provincial government reported the inspection results to the Ministry of Education for reexamination and approval. The applicant county would be awarded the CCEC title once the Ministry of Education certified the report, and its certified status made public at the end of the inspection year.

China's large regional disparity in economic conditions prompted the central government to establish timelines for different regions to achieve compulsory education targets. In 1993, the Ministry of Education drafted a multistage action plan with a timeline that reflected regional variations in development. The general principle is that counties with greater economic and educational resources should achieve their targets and be inspected earlier. In accordance with the characteristics of all relevant counties, each province designed a sequence of inspections and certifications in its jurisdiction per the Ministry of Education's directives. Once this sequence was finalized, no county could renegotiate the deadline with its provincial superior and all counties were required to "apply for" inspection prior to the deadline. As presented in Table A1 of the Appendix, we estimated an ordered probit model using a set of pre-determined county attributes in order to comprehend the determinants of the scheduled inspection sequence. Counties with lower per capita rural income or junior high school enrollment rates in 1992, which lacked adequate economic and educational resources to fulfill their targets, were inspected later. The Ministry of Education announced that 249 of the poorest counties, whose spatial distribution is displayed in Fig. A1 of the Appendix, were exempted from an inspection before 2001.[8] In the latter portion of this paper, these counties serve as a natural control group for our empirical analysis.

For their fulfillment of compulsory education targets, approximately 500 counties across 27 provinces received inspections between 1993 and 1994, and more counties joined afterward. The approved CCEC list was announced annually, as shown in Fig. 1. By the end of 2000, China's central government had achieved significant success with its campaign to promote compulsory education program.[9] As of 2001, every county applying for inspection obtained a CCEC title with no exception. This extraordinarily high success rate is not difficult to understand: a county would only apply for inspection if it was certain of meeting the compulsory education targets, as a failed evaluation would have amounted to political "suicide" for county leaders. Moreover, some evidence suggests that local governments cheated inspection teams, even if the actual progress in compulsory education had not reached the central government's standard.

The compulsory education promotion program lost its steam from 2002 onward, probably due to the change in top leadership from Jiang Zemin to Hu Jintao in that year and the resulting shift of national priorities. Indeed, 2001 was the last year that the Ministry of Education released county-level data on educational expenditures. Therefore, our analysis focuses on the period between 1993 and 2001, and Fig. 2 illustrates the spatial distribu-

[6] Data source: China's 1982 population census.

[7] At the national level, the target of being "generally accessible" was defined as covering over 85% of the population.

[8] Note that these counties also received CCEC inspections in different years after 2001.

[9] Since the remaining non-CCECs were all located in the economically underdeveloped interior regions, the progress became somewhat slower than before. It took China another eleven years to announce the final and complete fulfillment of compulsory education goals in 2011.

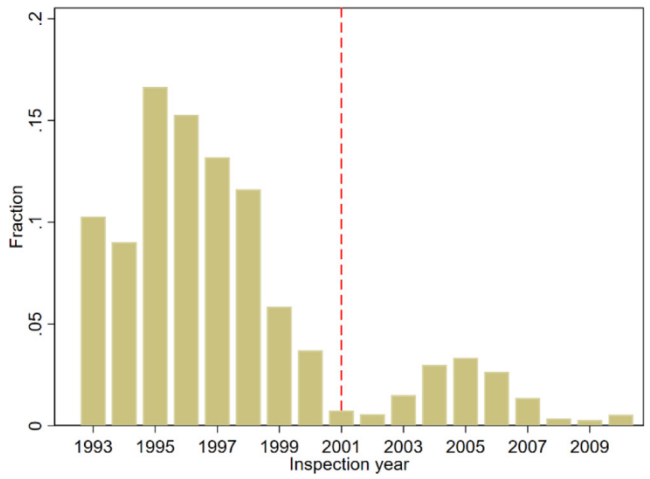

Fig. 1. Distribution of CCEC Inspections over Time. *Notes*: Our analyses are limited to 1993–2001 because the detailed county-level outcomes regarding educational inputs used in this study are no longer available from 2002.

tion of counties passing the inspection and receiving CCECs status during that period.

Table A2 of the Appendix illustrates the evolving patterns of educational inputs (measured by total education expenditure per county and budgetary education expenditure per county) and educational outputs (proxied by junior high school enrollment rate) spanning 1994–2001. From 1994 to 2001, the average education expenditure more than doubled, equating to an annual increase of approximately 11%, which was slightly lower than China's annual GDP increase of approximately 13% over the same period. Meanwhile, during the same time span, the average junior high school enrollment rate increased from approximately 74% to over 88%.

2.2. Financial challenges of compulsory education for county governments

In the 1990s and early 2000s, especially in the interior regions of China, achieving the nine-year compulsory schooling targets posed severe financial challenges for most counties. After the new initiative was launched in 1992, the financial burden of compulsory schooling was borne by county governments. To pass the inspection, it was necessary to increase junior high school enrollment from approximately 73% in 1993 to 95%. In the mid-1990s, with a 22% increase in junior high school enrollment, a typical county needed to accommodate nearly 3,600 more students per birth cohort, or 10,800 more students for the entire junior high school with a 3-year curriculum. According to the prevailing junior high school expenditure per pupil (670 RMB) in the mid-1990s, such an increase in enrollment would necessitate the county to increase annually its education expenditures by approximately 7.24 million RMB (10,800 $\times$ 670), or approximately 6% of the average county's annual budgetary expenditure. For a typical county government, this budgetary increase was challenging to accommodate. Furthermore, it should be noted that the above back-of-the-envelope calculation is conservative because it does not account for the additional expenditures associated with the construction of school buildings required to accommodate the significant enrollment growth.

The total educational expenditure comprises two parts: budgetary and extra-budgetary expenditures. Budgetary educational expenditures are usually financed by taxation and intergovernmental transfer payments from higher-level governments. The central government in China determines the tax categories, their bases, and rates. More than half of local tax revenues have been transferred to the central government since the tax-sharing reform in 1994 (Wong, 2000). For instance, in our sample period of 1993–2001, 75% of China's largest source of tax revenue, the value-added tax, went to the central government, whereas only 25% was retained by local governments, which were divided among provincial, prefectural, and county governments (Lou and Wang, 2007). Because county governments assumed primary responsibility for compulsory education, transfer payments from higher-level governments for compulsory education purposes were minimal. Unlike counties with a vibrant and developed local economy, the majority of counties were constrained by tight budgets, and increasing educational expenditures to achieve CCEC status was not a simple task.

The second portion, the extra-budgetary education expenditures, was financed through fees and surcharges levied on local firms and peasants for educational purposes. In the 1990s, local governments introduced semi-mandatory fees and surcharges, some of which were not authorized by the central government, in an effort to generate additional funds for educational expenditures. Local firms and peasants were forced to remit surcharges to raise their local educational funds. The county governments mostly determined surcharge rates in an *ad-hoc* manner. Due to their discretionary nature and lack of regulation from higher-level governments, extra-budgetary funds have become an essential source of financing for county governments when facing increasing fiscal pressures. During the sample period, the proportion of extra-budgetary education expenditures to total education expenditures ranged from 38% to 50%, as shown in Table A2 of the Appendix. However, excessive levies and surcharges imposed on local firms and peasants could lead to widespread complaints that might jeopardize local leaders' careers.

2.3. Political discipline and strategic responses in the compulsory education promotion program

Local officials were required to compete with their political peers for promotion through increased local economic growth. Consequently, they lacked sufficient incentives to improve education. In the late 1980s and the early 1990s, progress in compulsory education was sluggish due to the absence of political incentives for local leaders. To address this issue and promote the new initiative launched in 1992, the central government enacted new measures, one of which was an explicit stipulation that county leaders assume primary responsibility for achieving compulsory education targets. Failure to achieve the targets would disqualify county leaders (both party secretary and mayor) from promotion for a while, regardless of their performance in other tasks. This so-called "one-item veto" (*yi piao fou jue* in Chinese) system has been widely implemented to discipline local Chinese officials in several essential government tasks.[10] Under this scheme, local leaders' career advancement would not be aided by completing specified tasks in excess; however, under-fulfillment of those tasks would have severe career consequences. Due to the severe political repercussions, it is not surprising that there was not a single CCEC inspection failure during our sample period.

Given the "one-item veto" system of political discipline, county leaders who are either reluctant or financially unable to achieve the targets before the pre-specified inspection schedule may embrace a window-dressing strategy, i.e., temporarily reaching the minimum targets by mobilizing and reallocating resources *across categories* and *over time*. In resource mobilization and reallo-

[10] Similar incentives were also applied to achieve goals in other social responsibilities of local governments, such as birth control, social stability, workplace safety, and recently, environmental protection.

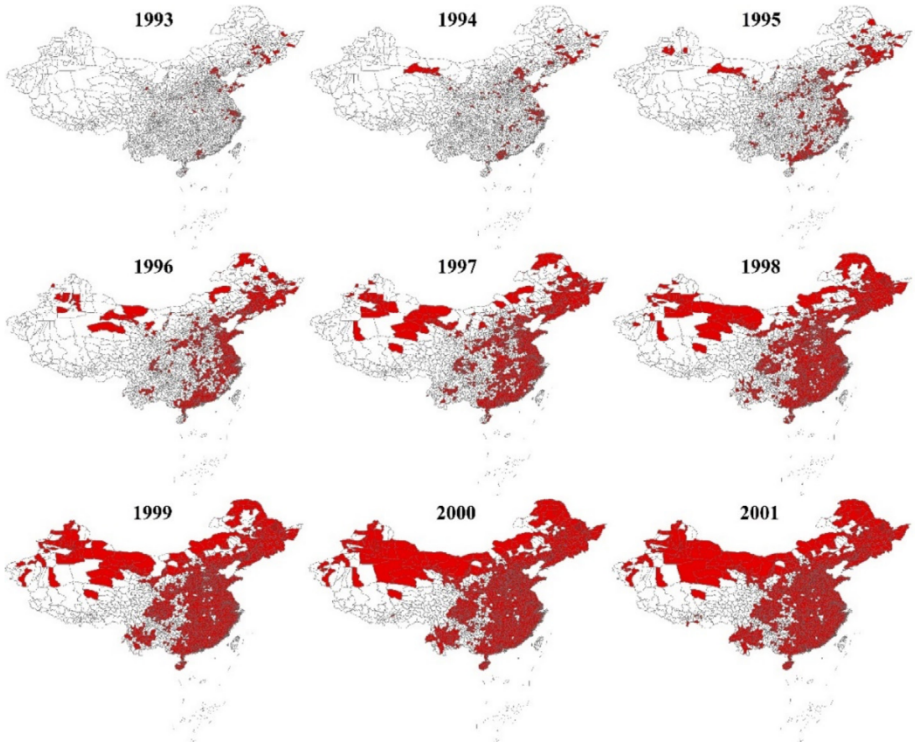

Fig. 2. The Spatial Rollout of CCEC Inspections in 1993–2001. *Notes*: Counties that passed the inspection are marked in dark color.

cation *across categories*, county governments would increase educational expenditures to escalate school enrollments, especially by leveraging discretionary extra-budgetary resources, such as increased levies on fees and surcharges. Whereas in resource reallocation *over time*, once compulsory education targets are achieved, the resources temporarily reallocated to education would revert to their original purposes; further, the unpopular educational surcharges on local firms and peasants would be reduced. Immediately after the completion of the inspection, all these reallocations would cause a sharp decrease in education expenditure, and educational performance (such as school enrollment) would also deteriorate and even fall below the original targets. We define these activities of resource mobilization and reallocation *across categories* and *over time* as the window-dressing behaviors of local leaders in response to inspection from their superiors. There is abundant anecdotal evidence that county leaders adopted the "window-dressing" strategy to handle compulsory education inspection and evaluation.[11] However, so far, there has been no systematic investigation of window-dressing behavior in China's compulsory education promotion program, which is the focus of our subsequent analyses.

3. Data

We developed a comprehensive dataset for all Chinese counties, encompassing the main period of the program, which covered 1993 to 2001.[12] We excluded all Tibetan counties from our analysis due to their special status in China and limited data availability. Using the province-level consumer price index (CPI), all time-varying outcomes are adjusted to the 1995 constant price.[13] Next, we describe in detail the main variables and data sources.

County-level information. From various years of *China's Education Yearbook*, we compiled data on the specific inspection year for each county. We collected a rich set of educational input measurements from various years of *China's Education Expenditure Yearbook*, including total education expenditure, budgetary education expenditure, extra-budgetary education expenditure, rural educational surcharge rate, and junior high school expenditures. Local governments operated and financed a majority of compulsory schools in China's educational system of the 1990s. Notable is the fact that all educational input outcomes in this study exclude infrastructure construction expenditures, which are funded through separate appropriations under China's fiscal system. We additionally gathered county-level budgetary revenues from various years of *the County Fiscal Statistical Yearbook*, and the population, rural income per capita, and GDP from numerous provincial-, prefectural-, and county-level statistical yearbooks.

County leaders' tenure. We collected manually the tenure information of county-level party secretaries and mayors from the *Organizational History of the Chinese Communist Party* of several provinces and hundreds of provincial-, prefectural-, and county-level chronicles. These documents contain information on the years when a county leader took or left office. The turnovers of county party secretaries and mayors occurred frequently and at any time. Consequently, if a given county party secretary/mayor has served for at least six months, we assign them a full year.

Individual-level variables. To investigate the real consequences of local governments' window-dressing behavior on affected cohorts, we created several individual-level variables using the 2005 China population mini-census. China's National Bureau of Statistics (NBS) provided a 20% random sample of the original pop-

[11] For example, International Herald Tribune: *A Survey on the Fraud of Compulsory School Dropout Rate*, 2005-1-25, (in Chinese), which can be accessed at https://news.sina.com.cn/e/2005–01-25/12195662198.shtml.

[12] As mentioned previously, our empirical analysis focuses on the period 1993–2001 because detailed county-level educational expenditure data are only available within this time range.

[13] The province-level CPI data comes from various years of *China's Statistical Yearbook*.

ulation mini-census, which is 0.2% of China's total population. The population census was conducted directly by the NBS and, therefore, immune to potential data manipulation by local governments. At that time, the average primary school enrollment rate had reached a fairly high level (i.e., about 98%); therefore, we focused on the junior high school graduation rate, which would more likely be affected by CCEC inspection. According to Chinese official guidelines, teenagers aged 13 to 15 should enroll in junior high schools. However, census data have no information on the period each individual spent in junior high school. To circumvent this obstacle, we created a dummy variable indicating whether an individual had graduated from junior high school as a measure of the quality of education. Moreover, the 2005 population mini-census provides the average monthly income as a measure of the later-life labor market outcome of the affected cohorts, which we use to analyze the consequences of window-dressing behavior. As control variables, we also consider each individual's gender and *Hukou* registration type (urban or rural). In 2005, when the population census was conducted, we used an individual's birthplace instead of his/her current residential address. To address the concern that our findings are driven by the endogenous migration of children from non-CCECs (generally poorer counties) to CCECs, our analysis sample excludes immigrants, namely those individuals whose birthplaces differ from their current residences. These immigrants represent approximately 9% of the initial sample size.[14] We restrict our final analytical sample to cohorts born between 1970 and 1989, who were aged 16–35 in 2005.[15]

Table 1 presents descriptive statistics of the main variables used in this study.

Table 1
Descriptive Statistics.

Variables	Obs.	Mean	Std. Dev.
Panel A: County-year-level outcomes			
Log(Education expenditure)	16,290	8.287	0.992
Log(Budgetary education expenditure)	16,130	7.855	0.866
Log(Extra-budgetary education expenditure)	16,010	7.019	1.514
Log(Per capita rural educational surcharge)	14,440	2.063	1.189
Panel B: Pre-determined county attributes			
Log(Per capita rural income, 1992)	2,308	6.443	0.449
Junior high school enrollment rate, 1992	2,308	0.786	0.205
Panel C: Individual-level outcomes			
1(Graduated from junior high school)	571,777	0.726	0.446
Average monthly income in 2005	494,715	439.0	547.9

4. Effects of the CCEC inspection on educational inputs

4.1. Main results

Examining the impact of CCEC inspection on educational inputs is our first step. We implement a staggered difference-in-differences (DID) strategy in an event study specification as follows:

$$Y_{c,t} = a + \sum\nolimits_k \tau_k Treat_c \times Inspect_{c,t,k} + \mu_c + \eta_{p,t} + \boldsymbol{X}'_{\boldsymbol{c,t}}\boldsymbol{\beta} + \varepsilon_{c,t}, \qquad (1)$$

where the subscripts c and t denote the county and the year, respectively. $Y_{c,t}$ is the outcome variable of interest in county c in province p during year t. $Treat_c$ is a dummy variable whose value is 0 if county c was exempt from inspection requirements prior to 2001 and 1 if otherwise. $Inspect_{c,t,k}$ is a set of dummy variables that indicate different timings relative to the pre-specified inspection year of county c. For example, $Inspect_{c,t,-3}$ = 1 if year t is three years before the pre-specified inspection year for county c, and it is omitted as the reference year; $Inspect_{c,t,1}$ = 1 if year t is one year after county c's inspection year; $Inspect_{c,t,0}$ = 1 if year t is the same year that county c receives the inspection. μ_c and $\eta_{p,t}$ denotes county fixed effects and province-by-year fixed effects, respectively, so that our identification is based on within-province comparisons. $\boldsymbol{X}'_{\boldsymbol{c,t}}$ is a vector of control variables. In our baseline specification, we incorporate the interactions of year dummies with two crucial county attributes in Panel B of Table 1, namely the logarithm of per capita rural income in 1992 and a county's junior high school enrollment rate in 1992. As a robustness check, we will further control for some time-varying covariates, including per capita GDP (in logs) and per capita fiscal expenditure (in logs). To address possibility of serial correlation and heteroscedasticity in the error terms, the standard errors are clustered at the county level for all panel regressions in this study.

To highlight Chinese local government's strategic responses to CCEC inspection, the event study results are presented in Fig. 3 with the specification in Eq. (1). As depicted in Panel (a), the total educational expenditure exhibited a virtually flat trend in years far from the pre-specified inspection year (i.e., years of $k \leq -3$), indicating that treatment and control counties performed similarly when the need to meet the requirements of the CCEC program was not yet urgent. As previously defined, the three years, namely, two years before the inspection and the inspection year, constitute the "preparation" period. When the pre-specified inspection period was approaching, the total educational expenditure increased rapidly to a significantly higher level. However, after the CCEC examination, there was an immediate and sustained sharp decline in total education expenditures that lasted for several years. Interestingly, county governments decreased their educational expenditures to levels below those of the pre-preparation period.

Panels (b) and (c) in Fig. 3 show separately the event study estimates for budgetary and extra-budgetary education expenditures before and after the inspection, respectively. This demonstrates that the aforementioned patterns of total educational inputs were mostly driven by the discretionary extra-budgetary education expenditures of local governments. In sharp contrast, budgetary education expenditures did not increase significantly during the preparation period. However, after the inspection, they experienced a sharp decline. In the 1990s, rural educational surcharges were the main component of extra-budgetary education expenditure. Panel (d) investigates the evolving patterns of per capita rural educational surcharges, with a similar narrative to Panel (c).

In summary, the patterns depicted in Fig. 3 indicate that county governments continuously increased spending on education after entering the critical time window for preparing for inspections, mainly by diverting more extra-budgetary resources and levying more surcharges on peasants and/or local enterprises.

In addition to the dynamic patterns depicted in the event study specification, we estimate the following DID regression in the specification of Eq. (2):

$$Y_{c,t} = \alpha + \beta_1 Treat_c \times Preparation_{c,t} + \beta_2 Treat_c \times Post_{c,t} + \mu_c + \eta_{p,t} + \boldsymbol{X}'_{\boldsymbol{c,t}}\boldsymbol{\beta} + \varepsilon_{c,t}, \qquad (2)$$

where $Post_{c,t}$ = 1 if county c obtained CCEC certification before year t. $Preparation_{c,t}$ denotes the "preparation" period, which occurs two years before the inspection and inspection year. The other variables are defined similarly as those in Eq. (1).

The regression results obtained using Eq. (2) are presented in Table 2. Column 1 shows that total educational expenditures increased by 3.5% (=exp(0.034) − 1) during the preparation period but decreased by 5.4% (=1 − exp(−0.056)) after CCEC certification.

[14] Our findings are robust to including these immigrants. The results are available upon requests.

[15] Alternating the sample choice does not affect our key findings.

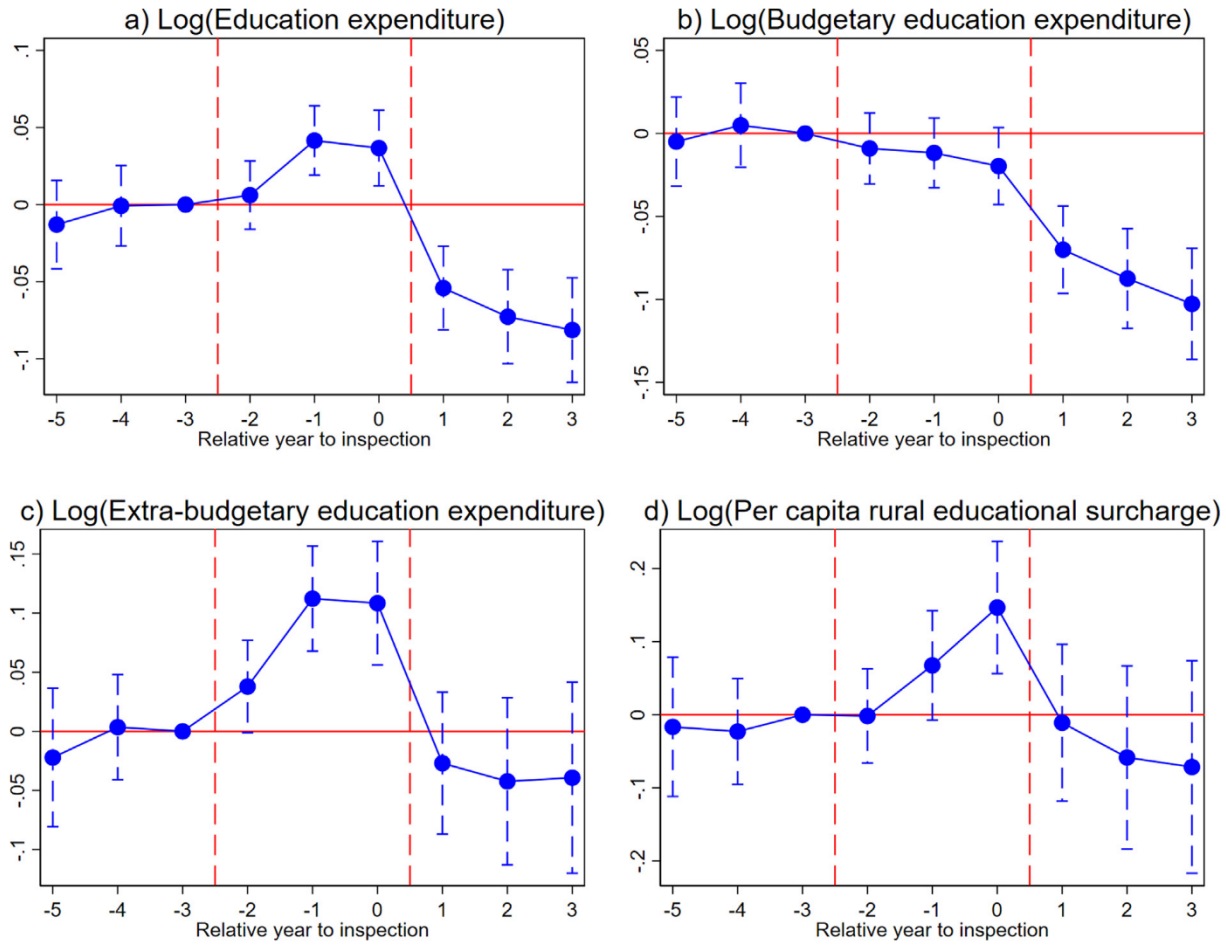

Fig. 3. Event Study Results on Educational Inputs. *Notes*: This figure presents the event study estimates for several county-level education inputs, as specified in Eq. (1). The solid circle represents the estimated coefficient for each year relative to the reference year, along with the 95% confidence intervals calculated using standard errors clustered at the county-level.

The impacts on the budgetary and extra-budgetary components of total educational expenditure are investigated in Columns 2 and 3, respectively. Similar point estimates exist for the post-inspection period. However, the increase during the preparation period appears to be salient only for the extra-budgetary education expenditures. The estimates for per capita rural educational surcharges in Column 4 are comparable to those in Column 3, confirming our interpretation that the extra-budgetary category was mostly financed through surcharges on peasants and local firms.

These patterns provide clear evidence consistent with the window-dressing behavior in meeting compulsory education targets: county governments increased educational expenditures to meet the target when the pre-specified CCEC inspections were approaching, but as soon as the inspection was completed and the CCEC status was awarded, their education promotion efforts slackened, resulting in significant cuts in education expenditures in subsequent years.

4.2. Robustness checks

The staggered nature of CCEC inspection raises serious concerns regarding the existence of negative weights and the potential heterogeneity in treatment effects within units over time or between groups of units treated at different times in the DID estimators when using the two-way fixed effects (TWFE) method (de Chaisemartin and D'Haultfoeuille, 2020; Goodman-Bacon, 2021). These challenges may also contaminate leads and lags in our event studies in Fig. 3, where all treated observations are pooled across groups (Sun and Abraham, 2021). To address this concern, we formally correct the event study plots, following Borusyak et al. (2022) and Sun and Abraham (2021), by accounting for staggered treatment timing.[16] Fig. A2 of the Appendix reports the event study plots after correcting for the staggered treatment, which reveals little inconsistency with the patterns illustrated in Fig. 3 using the TWFE estimator.

The staggered expansion of CCECs in our setting may further raise the concern that, instead of the window dressing behaviors of the treatment group counties, the pattern illustrated in Fig. 3 results from the flattening of their educational inputs by the treatment group counties after they passed the CCEC inspection and the continuous increase of their educational expenditures by the control group counties. To formally distinguish this alternative scenario from our preferred interpretation, Fig. A3 of the Appendix shows how educational expenditures of the treatment group counties evolved in years close to the inspection year. We regress educational inputs only on the county fixed effects in Panel A, and then plot the mean residuals of the treatment group counties against the time periods relative to the CCEC inspection time, and a reference line is added to show the data trend in pre-inspection periods. As we can see, there does exist a trend break around the inspection

[16] Note that Sun and Abraham (2021) only establish the validity of the interaction weighted (IW) estimators for balanced panel data without covariates, thus the results should be treated with caution.

Table 2
Effects of Inspections on Education Inputs.

Dep. Var.	(1) Log(Education expenditure)	(2) Log(Budgetary education expenditure)	(3) Log(Extra-budgetary education expenditure)	(4) Log(Per capita rural educational surcharge)
Treat × Preparation	0.034***	−0.001	0.080***	0.081***
	(0.010)	(0.009)	(0.019)	(0.030)
Treat × Post	−0.056***	−0.055***	−0.056**	−0.043
	(0.012)	(0.011)	(0.025)	(0.043)
Dep. Mean	8.290	7.858	7.022	2.064
Observations	16,290	16,130	16,010	14,440
# of Clusters	2,064	2,064	2,064	2,034
County FE	YES	YES	YES	YES
Province-Year FE	YES	YES	YES	YES
Controls	YES	YES	YES	YES

Notes: Standard errors clustered at the county level are reported in parentheses. The significance levels of 1%, 5%, and 10% are denoted by ***, **, and *, respectively.

year for all outcomes, indicating that local governments' window-dressing incentives pushed them to cut down educational inputs in post-inspection periods relative to the pre-inspection growing trend. To better understand the nature of the trend break, we further plot the data patterns of mean residuals after controlling for both the county fixed effects and county-specific linear time trend in Panel B of Fig. A3. Both panels show consistent patterns that educational inputs of the treatment counties of our interest increased in the preparation period but shrank significantly in the post-inspection years.

We also used the Propensity Score Matching approach to address the negative weights and treatment effect heterogeneity in the staggered DID setting (Borusyak et al., 2022; Sun and Abraham, 2021). We first estimate a Probit model using Log(Per capita rural income in 1992) and junior high school enrollment rate in 1992 as the explanatory variables to estimate the propensity score. Then we use the propensity score to match each treatment group county to a "never-treated" county and re-estimate the event study equation as specified in Eq. (2) using the TWFE approach. The results presented in Fig. A4 of the Appendix are qualitatively and quantitatively similar to those from our main specifications.

Additionally, we conduct two set of robustness checks to address potential concerns regarding our strategy, and the results are presented in Fig. A5 of the Appendix. In Panel A, we eliminate our controls on flexible time trends varying by the two predetermined county attributes; instead, we present results simply with basic fixed effects on county and province-by-year to demonstrate the extent to which our findings depend on the inclusion of controls. We control for two time-varying covariates, namely per capita budgetary expenditure (log) and per capita GDP (log), in Panel B to consider the confounding effects of local economic cycles. In terms of economic magnitude and statistical significance, the estimates for all subfigures in both Panels A and B change only slightly. There is also little evidence that these patterns result from demographic changes, as the number of junior high school students exhibits a typically flat trend around the inspection year, as revealed in a similar event study in Fig. A6 of the Appendix.

4.3. Addressing alternative interpretations

Local governments engage in window-dressing in order to fulfill compulsory education targets, according to our preferred interpretation of the empirical results presented in the preceding subsection. In this subsection, we provide evidence against two prominent alternative explanations.

4.3.1. Window dressing vs. natural contraction

A potential threat to our interpretation of the empirical findings is the possibility that a sharp drop in educational expenditure following the inspection is a natural consequence of educational investment dynamics and has nothing to do with window-dressing incentives. There are two possible scenarios for this phenomenon. On the one hand, local governments may need to construct school facilities to accommodate more students in order to achieve educational targets. The educational investment would inevitably decrease after all the school facilities had been constructed and the school enrollment target was fulfilled. On the other hand, to guarantee the fulfillment of the targets, certain conservative local governments may adopt an overshooting strategy and, as a result, improve educational performance to a level higher than the required level of the CCEC inspection. We contend that these alternative conjectures cannot account for previously documented patterns.

First, we detected potential fraud during the CCEC inspection and provided evidence to support our window-dressing hypothesis. According to an *ex-post* calculation based on 2005 population mini-census data, approximately 54% of the counties had not met the 95% junior high school enrollment rate, which is the minimum target mandated by the program at the time of inspection and evaluation. This finding mirrors some historical anecdotes suggesting that, despite some real efforts, some counties may have succeeded in cheating the inspectors sent by their supervisors and passed the inspection with a lower standard. To characterize the counties suspected of potential fraud during the CCEC inspection, we estimate the probit model in Table A3 of the Appendix. Specifically, we define *Fraud* as a dummy variable denoting a county suspected of fraud during the CCEC inspection based on whether its *ex-post* junior high school enrollment rate had reached 95% at the time of inspection. As anticipated, counties with weaker economic and educational endowments in fulfilling the task (i.e., counties with a lower junior high school enrollment rate or per capita rural income in 1992) were more likely to "pass" the inspection in a fraudulent way. We conduct a separate event study for *Fake Fulfillment* counties (counties under suspicion of fraud) and *Genuine Fulfillment* counties (the rest of the counties) in Fig. 4 to illustrate the heterogeneous effects of the CCEC inspection on educational inputs across counties more transparently. Consequently, we should observe a more pronounced decline in educational inputs in *Genuine Fulfillment* counties, if most counties use the overshooting strategy to cope with the inspection. However, the pattern illustrated in Fig. 4 was poles apart: the discrete changes in educational inputs induced by the CCEC inspection arose in both types of counties, indicating that our findings may not be the result of local government's overshooting strategy but rather a blatant slack off in compulsory education as a rational response to the incentive scheme underlying the program. Complementing the graphic evidence in Fig. 4, Table A4 of the Appendix presents the regression results obtained by combining the interaction terms of the *Fake Fulfillment* dummy with our main regressors. Regarding window

dressing on educational expenditures, we find no significant difference between *Fake Fulfillment* and *Genuine Fulfillment* counties.

It is worth noting that the upper-level government might also have the incentive to grant more certificates than it should for propaganda or for legitimacy purposes by lowering the bars of passing the CCEC inspections. Although we cannot fully reject this possibility, we provide some evidence to assess the extent to which this may matter in our context. We plot the histogram of the gaps between 95 (the target) and the junior high school enrollment rate in the inspection year from the census data (as denoted by Gap) in Fig. A7 of the Appendix. If the upper-level government strategically lowered the bar in its inspections, it would be manifested as a bunching of the Gap in a small neighborhood around 0 (i.e., "just hitting the certification threshold of 95%"). Fig. A7 of the Appendix, however, does not show a clear bunching of the Gap around 0.

Second, as described in Section 3, the only education expenditure categories used in our analysis are primary expenditures on personnel expenditures, such as the wage bills of teachers and staff, and operation expenditures, such as expenditures on school management and operations. The construction of school facilities was excluded from this expenditure category. Personnel and operation expenditures vary proportionally with the school enrollment size of the entire county. We should not witness a sharp decline immediately after the inspection, assuming the county government can maintain its targeted level of student enrollment after the inspection.[17] Panel (c) in Fig. A8 of the Appendix confirms that county governments increased their non-rigid operation expenditures during the preparation period, but radically reduced them after the inspection, when maintaining a high school enrollment level was no longer required. Because operation expenditures are recurrent expenses, this finding also helps alleviate the concern that the main results in Fig. 3 and Table 2 arose from a natural contraction of one-off expenditures. In contrast to operation expenditures that can be adjusted flexibly, personnel expenditures are largely rigid, as shown in Panel (b) of Fig. A8. The different elasticities of personnel and operation expenditures in response to fiscal pressures imposed by the inspection are strong evidence for our window-dressing interpretation. This finding also mitigates the concern that the sharp increase in educational expenditures during the preparation period was attributed to the fast expansion of schools and teachers' employment to meet the requirements of the CCEC program.

The evidence presented above supports the interpretation that the sharp decline in educational inputs is attributable to local governments' window-dressing behavior rather than a natural contraction after a big push or due to local governments' overshooting strategy.

4.3.2. Window dressing vs. local political cycles

Another alternative hypothesis is that the reversed evolving trend of educational inputs, observed in Fig. 3 and Table 2, may result from local political cycles instead of reflecting the window-dressing behavior of the county leaders in response to the superiors' inspection. As described in Section 2.3, the Chinese central government explicitly proclaimed that county party secretaries and mayors should assume primary responsibility for passing the CCEC inspection within the pre-specified timeline. Although the whole tenure lasts five years, there is frequent turnover among Chinese county party secretaries/mayors. According to our calculation, the average tenures of China's county party secretaries and mayors who served between 1993 and 2000 were approximately 3.5 years and 2.8 years, respectively. Guo (2009) provides evidence for the effects of local political cycles in China, namely the close correlation between the tenure of county leaders and county fiscal expenditures.

To formally address this alternative hypothesis, we examined the correlation between the timing of a county leader's turnover and the timing of the inspection in the county. Specifically, we conduct a regression as specified in Eq. (1), but replace the dependent variable with a dummy variable indicating the turnover of a county party secretary or a county mayor in a given year. Fig. A9 of the Appendix depicts the findings and shows that most of the estimated coefficients are indistinguishable from zero and exhibit no discernible patterns of evolution over time. This evidence suggests that the timing of a county's inspection is virtually independent of either the county party secretary or the mayor's tenure.

4.4. Impacts of political incentive on window-dressing behavior

This subsection further examines the heterogeneity of the CCEC inspection. As shown in Fig. A9 of the Appendix, the CCEC inspection schedule had little correlation with local leaders' tenure. Thus, we utilize the irrelevance of county leaders' tenure in relation to the CCEC inspection to connect to the potential role of political incentives in driving the window-dressing phenomenon among local leaders.

As previously indicated, in China's meritocracy-based political selection process, economic performance within local leaders' jurisdictions has been a key performance indicator of upper-level officials' evaluations of their promotions. During their tenure, promoting compulsory education would contribute little to the local economy in the short run. Furthermore, the average tenure for a county party secretary/mayor was only approximately 3.5/2.8 years in our data. As they were approaching the time thresholds for promotions, local leaders who remained in their current positions for a longer period generally had more substantial career advancement incentives.[18] Therefore, we hypothesized that, *ceteris paribus,* county party secretaries who had been in their current positions for a longer time tended to divert educational inputs more aggressively because they were eager to pursue short-term economic growth records for promotion.

To formally test this hypothesis, we added the interaction between a full set of dummy variables denoting the county party secretary's tenure and our DID regressor ($Post \times Treat$) to the specification of Eq. (2). The fixed effects of county party secretary are also included. Thus, this strategy compares the average outcomes of counties whose party secretaries are holding varying tenures at the time of inspection. The estimated coefficients of the interaction terms for all columns in Table 3 reveal an increasing trend (in absolute value) related to the length of the current county party secretary's tenure. These patterns are consistent with our hypothesis and jointly aid in establishing the linkage between local governments' window-dressing phenomenon and local leaders' political incentives and point to political incentives as a critical driver of window-dressing behaviors in China's education promotion program.

We also explore how county mayors' incentives affect their window-dressing behaviors and whether this impact is similar to that of party secretaries. The results are reported in Table A5 of the Appendix. We find that political career incentives measured by county mayors' tenure have also played a significant role in affecting county-level educational inputs. Compared to the results

[17] In China, operation expenses for education include (i) expenditures on school administration, teacher training, and lab experiments for students, (ii) recreational and sports activities, (iii) electricity, heat, and water supply, (iv) equipment and books purchases, and (v) repairs and maintenance of school facilities. The personnel expenditures accounted for about 89% of educational expenditures for junior high schools during our sample period.

[18] A body of empirical literature studying China's political system (e.g., Guo, 2009, Chen et al., 2022) also uses county party secretaries' tenure to proxy for their political incentives.

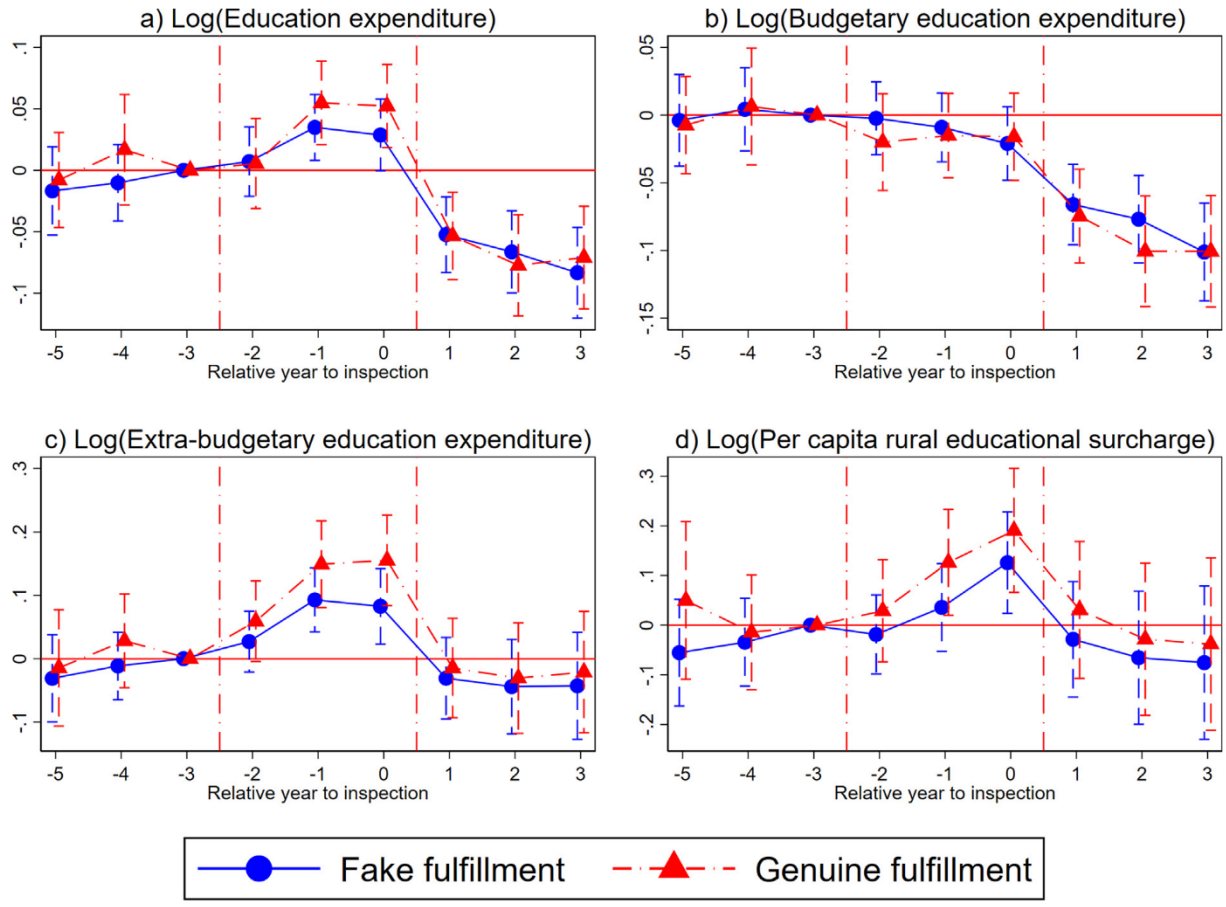

Fig. 4. Heterogeneous Effects on Educational Inputs Across Counties with Different Goal Fulfillment Status. *Notes*: This figure displays the heterogeneous effect of the CCEC inspection on several county-level education inputs depending on whether a county's *ex-post* junior high school enrollment rate in the inspection year we calculated, based on the 2005 mini-census data, had reached the threshold of 95%, which we defined as "Genuine fulfillment" or "Fake fulfillment." This specification follows the main event study specification in Eq. (1). The solid circle and triangle represent the estimated coefficient for each year relative to the reference year, as well as the 95% confidence intervals calculated using standard errors clustered at the county-level.

for county party secretaries in Table 3, the heterogeneity across county mayor's tenure is noisier in terms of magnitude and statistical significance in some columns. This is not surprising for two reasons. First, county party secretaries have more political authority than mayors in China's local governance system when they make important decisions (such as the resource allocation in education); Second, a considerable proportion of county mayors took over the position of party secretary in the same county after their tenure as a mayor ended, which made county mayors' incentives somewhat complex. Nevertheless, our finding echoes historical narratives that both county party secretaries and mayors should be responsible for the results of the CCEC inspections.

5. Real consequences of the CCEC inspection on the affected cohorts

This section investigates the consequences of window dressing during the CCEC campaign on the affected cohorts. Using the 2005 population mini-census, we test the hypothesis that, all else being equal, exposure to the local government's window-dressing behavior at the age of entry into junior high school will harm the human capital formation and later-life labor market outcomes of the affected cohorts.

We adopt an estimation strategy that compared cohorts who had reached the age of entry into junior high school (i.e., 13 years old) after a county received CCEC inspection to cohorts that were slightly older and evaluate whether the former had worse outcomes of interest:

$$Y_{i,c,t} = \alpha + \sum\nolimits_k \tau_k Inspect_{c,t,k} \times Treat_c + \mu_c + \eta_{p,t} + \boldsymbol{X}'_{\boldsymbol{i,c,t}}\boldsymbol{\beta} + \varepsilon_{i,c,t} \quad (3)$$

where individual i in county c in province p was required to enter junior high school in year t. $Y_{i,c,t}$ is the set of outcome variables for individual i, which include a dummy variable indicating whether an individual i had graduated from junior high school, as well as his/her average monthly income in 2005. $Inspect_{c,t,k}$ = 1 if cohort t achieved the eligibility age (13 years old) for junior high school k years after the pre-specified inspection year of county c. The cohort $k = -6$ is omitted as the reference group. $\boldsymbol{X_{i,c,t}}$ is a vector of control variables at the individual level, including fixed effects on gender and registration types in the *Hukou* system (urban or rural). The other variables are specified as in Eq. (1). The clustering of standard errors occurs at the county level. We weigh all individual-level regressions by the inverse of the number of observations in each county following Bernstein et al. (2019). This practice ensures that each county receives the same weight and hence avoids the over-weighting of counties with a large population.

Fig. 5 presents the event study results by estimating Eq. (3). Given the cumulative nature of the impacts of the CCEC inspection on the students of different cohorts, the treatment status of an individual being exposed to the program is somewhat complex. The cohorts −6 and −5 who were older than 16 years when the "preparation" period arrived, should not be affected by the surges

Table 3
Heterogeneous Effects of County Party Secretaries' Tenure on Educational Inputs.

Dep. Var.	(1) Log(Education expenditure)	(2) Log(Budgetary education expenditure)	(3) Log(Extra-budgetary education expenditure)	(4) Log(Per capita rural educational surcharge)
Treat × Post	−0.054***	−0.009	−0.107***	−0.079*
	(0.010)	(0.009)	(0.021)	(0.048)
Treat × Post × $\mathbf{I}^{\text{Tenure=1}}$	−0.022***	−0.020***	−0.020	−0.060*
	(0.007)	(0.006)	(0.012)	(0.032)
Treat × Post × $\mathbf{I}^{\text{Tenure=2}}$	−0.039***	−0.030***	−0.049**	−0.088*
	(0.010)	(0.009)	(0.020)	(0.050)
Treat × Post × $\mathbf{I}^{\text{Tenure=3}}$	−0.054***	−0.048***	−0.056**	−0.111*
	(0.013)	(0.012)	(0.027)	(0.066)
Treat × Post × $\mathbf{I}^{\text{Tenure}\geq 4}$	−0.069***	−0.058***	−0.091**	−0.157**
	(0.017)	(0.016)	(0.035)	(0.079)
Dep. Mean	8.324	7.880	7.097	2.099
Observations	15,849	15,692	15,581	14,099
# of Clusters	2,006	2,005	2,003	1,971
Leader FE	YES	YES	YES	YES
County FE	YES	YES	YES	YES
Province-Year FE	YES	YES	YES	YES
Controls	YES	YES	YES	YES

Notes: This table examines the heterogeneity of different county-level educational inputs in relation to the dimensions of the incumbent local party secretary's tenure. The group *Tenure = 0* is omitted as the reference group. Standard errors clustered at the county level are reported in parentheses. The significance levels of 1%, 5%, and 10% are denoted by ***, **, and *, respectively.

of educational inputs since they should have already graduated from junior high school. The cohorts between −4 and −2, should have already enrolled in junior high schools at different grades during the "preparation" period and would benefit differentially from the surges in educational inputs. However, this trend was reversed once an individual (i.e., the cohorts from $k = -1$) had been partially exposed to the reduction in educational inputs after the CCEC inspection and experienced a continuous decline thereafter.

Because completion of junior high school is a significant predictor of a person's later-life labor market outcomes, it is natural to hypothesize that local governments' window dressing behavior would cause economic losses to the affected cohorts. As a proxy for the "real" effect of the program, we focus on the average monthly income in 2005 to investigate this issue. Fig. 6 depicts the results of the event study. Compared to the first rise and then fall of junior high school graduation in Fig. 5, we observe a generally flat trend for cohorts $k = -2$ or earlier and a significant decline of average monthly income for cohorts who suffered from the post-inspection reduction in educational expenditures. One plausible explanation for this somewhat surprising pattern is that local governments took all possible measures to urge school-age children to enroll in schools to meet the targets set by the CCEC program but devoted limited efforts to improving education quality. In other words, the increased education attainment due to the educational campaign was largely offset by the decline in educational quality and thus failed to translate into a significant increase in labor earnings.

As discussed in Section 4.2, we report the event study results on individual-level outcomes after adjusting for the staggered treatment timing, following Borusyak et al. (2022) and Sun and Abraham (2021). The results for junior high school graduation outcomes and later-life wages, which are provided in Figs. A10 and A11 of the Appendix respectively, are similar to those in Figs. 5 and 6. Fig. A12 of the Appendix illustrates the evolving patterns of individual-level outcomes of treatment group counties. In Panel A, we only control for county fixed effects to estimate the regression residuals; in Panel B, we further add the cohort fixed effects to account for the fact that older people on average earned more within our sample cohorts aged 16 to 35. In both panels with and without the cohort fixed effects, junior high school graduation status shows a significant trend break for cohorts exposed to the sharp reductions of educational inputs after the inspection. When

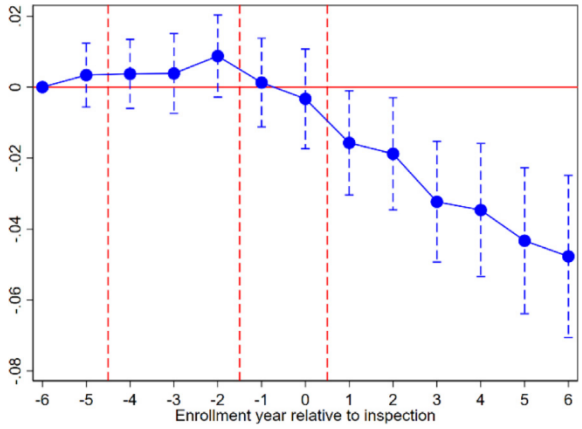

Fig. 5. Event Study Results on Junior High School Graduation Rates. *Notes*: This figure presents the event study estimates for individual-level junior high school graduation status in the 2005 population mini-census data using Eq. (3). We controlled for fixed effects on gender and registration type in the *Hukou* system (urban or rural) and weigh the regressions by the inverse of the number of observations in each county. The solid circle represents the estimated coefficient for each cohort relative to the reference cohort, as well as the 95% confidence intervals calculated using standard errors clustered at the county-level.

it comes to average monthly income, the downward trend in pre-inspection periods disappears as expected when age effects are controlled for. Thus, we will rely on Panel B of Fig. A12 to interpret our results. The patterns for both junior high school graduation rates and later-life income strongly suggest a trend break for cohorts exposed to the sharp reductions of educational inputs after the inspection. These pieces of evidence suggest that our findings may not be contaminated by the potential pitfalls of applying the TWFE method and lend further support to our "window dressing" interpretation.

To better comprehend the magnitude of the effects of the CCEC inspection on individual outcomes, Table 4 reports the regression results. In Column 1, we find that the cohorts joining junior high school after the CCEC inspection experienced a 2-percentage-point reduction in the likelihood of graduating from junior high school. This reduction can translate into approximately 800,000 fewer junior high school graduates out of China's school-aged pop-

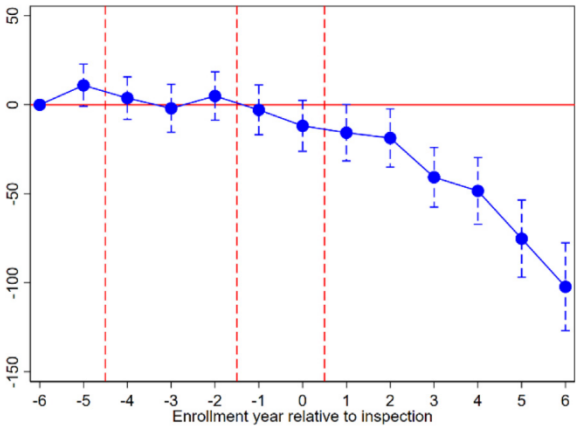

Fig. 6. Event Study Results on Later-life Labor-market Performance. *Notes*: This figure depicts the event study estimates for individual-level later-life labor market performance (i.e., average monthly income) in the 2005 population mini-census data using Eq. (3). We controlled for fixed effects on gender and registration types in the *Hukou* system (urban or rural) and weigh the regressions by the inverse of the number of observations in each county. The solid circle represents the estimated coefficient for each cohort relative to the reference cohort, along with the 95% confidence intervals calculated using standard errors clustered at the county-level.

Table 4
Effects on Junior High School Graduation Status and Later-life Labor Market Outcome of the Affected Cohort.

Dep. Var.	(1) **1**(Graduated from Junior High School)	(2) Average monthly income in 2005
Treat × $\mathbf{I}^{k=-4,-3,-2}$	0.010**	0.163
	(0.004)	(4.193)
Treat × $\mathbf{I}^{k=-1,0}$	0.002	−9.110*
	(0.006)	(5.422)
Treat × $\mathbf{I}^{k>0}$	−0.021***	−28.228***
	(0.007)	(6.521)
Dep. Mean	0.726	439
Observations	571,777	494,715
# of Clusters	2,308	2,308
County FE	YES	YES
Province-Cohort FE	YES	YES
Individual Controls	YES	YES

Notes: Individual controls include fixed effects on gender and registration type (urban or rural) in the Hukou system. We weigh the regressions by the inverse of the number of observations in each county. Standard errors, clustered at the county level, are reported in parentheses. The significance levels of 1 %, 5%, and 10% are denoted by ***, **, and *, respectively.

ulation, indicating a severe deterioration in human capital accumulation. Column 2 of Table 4 reports the regression results on later-life labor market outcomes. Compared with their counterparts, the affected cohorts suffered a penalty of 28 RMB, or approximately 6.4% of the sample mean, in average monthly income in 2005.[19]

Taken together, the above results provide important evidence suggesting that local governments' window-dressing behavior, as a strategic response to the CCEC inspection, created long-lasting shadows on the later-life outcomes of the affected cohorts.

[19] This finding is highly robust when we restrict the regression sample to individuals with strictly positive monthly incomes, suggesting that potentially endogenous work decisions did not drive the negative effects of the CCEC inspection on income.

6. Conclusion

Window dressing is a typical strategic response to incentive schemes observed in various organizations. Existing literature has focused on window-dressing behavior in the private sector; however, we provide evidence of the window-dressing phenomenon in the public sector by analyzing the strategic responses of local Chinese officials to the compulsory education promotion program, which was launched in the 1990s by the central government. According to this initiative, the provincial governments of Chinese counties will conduct inspections to determine whether the compulsory educational targets were achieved by the pre-scheduled time. Failing to pass the inspection would have severe negative career consequences for county leaders. We observe a progressive increase in county-level educational expenditures as the inspection time neared, followed by a dramatic decline soon after the inspection. This post-inspection decrease in education expenditures occurred despite the fact that *ex-post* calculations based on the population census show that more than half of the certified counties failed to achieve the targets at the time of inspections. We interpret this phenomenon as evidence of the window-dressing behavior of county governments. Further analysis reveals that local officials with a longer tenure in their current position and a stronger incentive for political advancement exhibited window-dressing behavior more aggressively. The window-dressing behaviors generated real distributional effects: junior high school graduation rates declined significantly after the inspection. In 2005, the cohorts exposed to local governments' window-dressing behavior had a lower average monthly income, indicating a likely decline in education quality.

While window dressing in the public sector can be generally classified as distortions generated by high-powered incentives in the public sector (Finan et al., 2017), it is conceptually different from other distortions, such as data manipulations or multitasking agency problems (Holmstrom and Milgrom, 1991). We believe that the window-dressing phenomenon we documented in China's nationwide compulsory education promotion policy for government officials is not peculiar to China and can apply to broader contexts that feature top-down target setting, performance evaluation, and strong political incentives. We also believe that the window-dressing behavior we document in this paper is an important contributor to the broader problem of information loss in non-democracies.

Our analysis also has specific policy implications for tackling window-dressing behavior in the public sector. Local governments' window-dressing behavior in our setting is mostly driven by the one-time inspection of target fulfillment. A one-time inspection is insufficient because the essence of window dressing is the intertemporal reallocation of resources across different categories. Thus, a random repetitive inspection strategy is useful for mitigating the incentive for window dressing.

Data availability

Data will be made available on request.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary material

Supplementary material to this article can be found online at https://doi.org/10.1016/j.jpubeco.2023.104878.

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