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Political uncertainty and cost stickiness: evidence from prefecture-city official turnover in China

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Abstract

Purpose – The aim of this study is to investigate the impact of local political uncertainty on the asymmetric cost behavior (i.e. cost stickiness) for listed firms in China.

Design/methodology/approach – In this study, the authors manually collect the turnover data of prefecture-city officials as a measure of exogenous fluctuations in political uncertainty and obtain firm-level financial information from the China Stock Market Accounting Research (CSMAR) database. To perform the analysis, the authors augment the traditional cost stickiness model by including the interaction terms of the prefecture-city official turnover, and firm-level and prefecture-city level control variables.

Findings – The authors find that political turnover leads to a higher degree of cost stickiness, implying that firms retain slack resources when political uncertainty is high. Moreover, the effect of political turnover on cost stickiness is more pronounced for firms residing in regions with weaker institutional environments, and firms that are privately owned and with smaller size. The authors further provide evidence that policy uncertainty and the threat of losing political connection are two underlying channels. Overall, this study documents that the local political process is an important channel that influences corporate operational decisions.

Originality/value – This study provides the first piece of evidence on the relation between political uncertainty and cost stickiness at the local government level. Moreover, the authors propose and demonstrate two underlying channels through which political uncertainty affects firms' asymmetric cost behavior.

Keywords Cost stickiness, Local official turnover, Political uncertainty, Ownership structure, Institutional environment

Paper type Research paper

1. Introduction

In recent years, researchers have amply established that politics influence corporate behaviors and economic outcomes, both in developed (e.g. Julio & Yook, 2012; Gulen & Ion, 2016) and developing countries (e.g. An, Chen, Luo, & Zhang, 2016; Xu, Chen, Xu, & Chan, 2016). A significant amount of this research highlights the role of uncertainty in this

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influence. While extensive prior studies focus on the impact of political uncertainty on corporate investment and financing activities, the evidence on how political uncertainty affects corporate operational decisions remains scarce. This is an important question because politics has direct effects on corporate operations through the cost of inputs (work and resources) and customer behaviors and can also threaten business continuity. In this study, we contribute to the literature by examining how local political uncertainty affects corporate operational decisions evident in cost stickiness.

The concept of cost stickiness is first introduced by Anderson, Banker, and Janakiraman (2003), referring to the phenomenon that costs response to an increase in sales is greater than costs response to an equivalent decrease in sales. Extant research has identified different drivers of cost stickiness, including deliberate managerial decisions (e.g. Anderson *et al.*, 2003; Chen, Lu, & Sougiannis, 2012) and firm-level characteristics such as asset intensity and employee intensity (e.g. Balakrishnan, Petersen, & Soderstrom, 2004) [1]. However, in focusing on the cross-sectional determinants of cost stickiness, existing research generally ignores the inter-temporal changes in cost stickiness. Prior studies argue that managers respond to uncertainty by delaying downward adjustment of committed resources until they are more certain about the permanence of a decline in demand (e.g. Anderson *et al.*, 2003). This suggests that cost stickiness appears when uncertainty rises and reverses when uncertainty is resolved. Nevertheless, this inter-temporal change in cost stickiness is rarely discussed because prior research focuses on the sources of uncertainty rather than its timing. Typically, political uncertainty arises when a political event occurs and later resolves. Given that cost stickiness is an outcome of inter-temporal shifts in uncertainty, the net effect of political uncertainty on the sticky cost behavior provides a good opportunity to examine the inter-temporal pattern in cost stickiness.

In this study, we examine the impact of political uncertainty on cost stickiness in China. Specifically, we use prefecture-city official turnover in China as a measure of local political uncertainty. In China, political uncertainty is unequivocally associated with the election and turnover of government officials at local levels, for example, prefecture-city party secretaries and mayors. Local governments have significant autonomy in their regions [2] and thus their turnover has wide-ranging implications not only for industry regulation, economic policy and tax distortion but also for the overall economic environment where firms operate (Chen, Chen, Wang, & Zheng, 2018; Bai, Hsieh, & Song, 2020). Consequently, firms often face a significant amount of uncertainty related to the timing and content of local government policy changes, as well as the potential impact that these policies will have on firms' operations. Because the option value of waiting increases when uncertainty is high (Bloom, Bond, & Van Reenen, 2007), firms have strong incentives to delay the deliberate resource commitment decisions in turnover years, which in turn increase the degree of cost stickiness. Therefore, the effect of political uncertainty on cost stickiness is an important empirical question associated with firms' operation and profitability. Moreover, we expect that political uncertainty stemming from local government official turnover strengthens the asymmetric cost behavior.

China provides an ideal setting to explore the relation between political uncertainty and cost stickiness for several reasons. First, due to China's unique socioeconomic system and political bureaucracy, politics and politicians play an explicitly predominant role. The government directly controls resources and allocates wealth, which in turn creates uncertainties for firms (Haveman, Jia, Shi, & Wang, 2017). Thus, managing political uncertainty is a primary task for Chinese firms (Han, He, Pan, & Shi, 2018), and political concerns likely exert a paramount effect on business decisions, such as the decision on resource adjustments in our context. Second, prefecture-city official turnover in China creates a unique experimental setting. The upper-level government exclusively determines appointments of prefecture-city officials in secret deliberations. As such, Chinese firms are subject to frequent but unanticipated changes in their political leaders, with no advance knowledge of the likely timing, who is likely to gain the office, or what their approach to

business is likely to be [3]. Moreover, local official turnover also indicates the threat of losing firms' prior political connections (Fang, Li, Xu, & Yan, 2018; Jiang, Jia, Bai, & Bruton, 2021). Hence, prefectural official turnovers provide a better randomized sample of external political shocks than the fixed calendar election cycles used in prior studies (e.g. Białkowski, Gottschalk, & Wisniewski, 2008; Boutchkova, Doshi, Durnev, & Molchanov, 2012; Julio & Yook, 2012, 2016; Lee, Pittman, & Saffar, 2020). Third, regional divergences of institutional environment and firm heterogeneities such as ownership structure are more typical in the Chinese market than in the developed countries that form the backdrop of most existing studies (Allen, Qian, & Qian, 2019). Analyzing how these characteristics interact with local political turnover in a market that particularly values business-government relations can deepen our understanding of the possible asymmetry of the political uncertainty effect.

Our empirical analysis offers several findings. First, we show that political uncertainty stemming from prefecture-city official turnover increases firms' asymmetric cost behavior, controlling for firm-level characteristics and local economic conditions. A 1% (corresponding to 50.12 million RMB) decrease in sales revenue leads to a 1.2 million RMB increase in sticky operating costs in turnover years relative to non-turnover years, a large and statistically significant difference. The results are consistent with the findings in Lee *et al.* (2020) and suggest a positive relation between political uncertainty and cost stickiness. To address the potential endogeneity concern, we conduct an instrumental variable analysis, a placebo test, and matched sample approach, and reach the same conclusion. In addition, our findings are robust to alternative specifications of local official turnover and cost categories and controlling the anti-corruption campaign and national election effect.

After establishing a positive relation between local political uncertainty and the level of cost stickiness, we turn to focus on the cross-sectional analyses. Markets with weak institutions and marketization create opportunities for political factors to influence business activities (Zhang, Han, Pan, & Huang, 2015; Gu, Tang, & Wu, 2020). If political turnover takes place in a region characterized by a weak institutional environment, the political uncertainty arising from changes in local government officials would be amplified, reinforcing firms' asymmetric cost behavior. Consistent with this prediction, we show that the impact of political uncertainty on cost stickiness is stronger when firms are in regions with a weaker institutional environment.

Besides the local institutional environment, we also focus on the impact of ownership identify and firm size on the relation between political uncertainty and cost stickiness. We find that the impact of political uncertainty on cost stickiness is more pronounced for privately owned enterprises (POEs) than for state-owned enterprises (SOEs). This result is consistent with findings by Feng & Johansson, 2017 on innovation and Ni (2019) on cash holdings. SOEs receive various economic benefits from both central and local governments. When the turnover occurs, the state ownership makes the firm more likely to continue receiving support from the new leader when she takes up her new position immediately, leaving such firms less vulnerable to political uncertainty. Due to their larger resource bases and the advantage of economies of scale, larger firms are better equipped than small ones to handle the political uncertainty in a transitional economy like China (Haveman *et al.*, 2017). Consistent with the line of reasoning, we show that the impact of local political turnover concentrates on small firms.

There are two potential channels through which local official turnover can influence cost stickiness: policy uncertainty and the threat of losing political connection. Our above cross-sectional analyses are consistent with the implications from both channels but are hard to differentiate between them. We further test the validity of each channel conditional on the type of official turnover and the type of political connection. First, the degree of economic policy uncertainty driven by local official turnover is arguably dependent on the turnover type. Specifically, economic policy uncertainty is likely to be higher when an official is

appointed externally and when the turnover is unexpected. Consistent with this line of reasoning, we show that the impact of local political turnover is more pronounced for external appointments and unexpected turnovers. Therefore, our finding supports the economic policy uncertainty mechanism. Second, following Zhang, Marquis, and Qiao (2016), we identify two types of political connections for POEs: the ascribed bureaucratic connections that represent political background that the individual executive obtained before entering the business, and the other is achieved political connections that result from political appointments to state organs after executives became successful business leaders. Because the latter is easier to lose its current political connection than the former (Zhang *et al.*, 2016; Jiang *et al.*, 2021), the political connection channel predicts that the impact of that firms with executives who have achieved bureaucratic connections are more affected by the political uncertainty arising from changes in local government officials. We confirm this prediction in the empirical analysis. Overall, our findings suggest that these two channels are both valid and jointly shape the impact of local political turnover.

Our study contributes to the literature in the following ways. First, we add to the literature on the economic implications of political uncertainty. Recent studies in corporate finance have documented that political uncertainty has a negative impact on corporate investment and financing activities, such as reduced investments, increased risk premiums and higher cost of capital (e.g. Julio & Yook, 2012; Gulen & Ion, 2016; Çolak, Durnev, & Qian, 2017; Gao, Murphy, & Qi, 2019), but rarely discussed how it affects corporate operational decisions. We extend this strand of research by investigating the relation between political uncertainty and cost stickiness.

Second, our study relates to the work by Lee *et al.* (2020), which investigates the impact of political uncertainty arising from national elections on cost stickiness in 55 countries. Nonetheless, the authors exclude China in their sample because there is no national election uncertainty in a one-party system. However, local political uncertainty is prevalent in China, where local governments have enormous political power and administrative capacity to influence corporate behaviors (Bai *et al.*, 2020). To fill this gap, we use prefecture-city official turnover as a measure of political uncertainty and provide the first piece of evidence on the relation between political uncertainty and cost stickiness at the local government level. Generally, China has rich prefecture-level city leadership turnover data for analysis. To limit the power controlled by local officials and empower career politicians, political turnover is undergone frequently. By using this large sample data, our study can provide more comprehensive and reliable inferences. Lee *et al.* (2020) focus on the overall impact of political uncertainty, whereas we take a further step to explore different responses between SOEs and POEs, and more importantly, we propose and identify two underlying channels through which political uncertainty affects firms' asymmetric cost behavior.

Third, this study examines the impact of the regional institutional environment, thereby extending existing cross-country studies to encompass a more microscopic perspective. Calleja, Steliaros, and Thomas (2006), Banker, Byzalov, and Chen (2013) and Lee *et al.* (2020) argue that differences in legal origins across countries have significant effects on corporate behavior. Based on this logic, we investigate differences in regional institutional environments in China and their impact on the relation between political uncertainty and cost stickiness. In contrast to the finding by Lee *et al.* (2020) that firms in countries with weak institutions are less sensitive to political uncertainty, we document the opposite at the local government level in China. We, therefore, contribute to the literature by revealing that the local institutional environment plays an important and unique role in the effect of local official turnover on firms' asymmetric cost behavior.

The remainder of the paper is structured as follows. Section 2 presents the literature review and the development of hypotheses. Section 3 discusses data and methodology. Section 4 reports the empirical results. We conclude our paper in Section 5.

2. Literature review and hypothesis development

2.1 The determinants of cost stickiness

The traditional cost behavior model distinguishes costs as fixed and variable and describes a mechanistic relation between economic activity and costs, stating that fixed costs are independent of the level of activity and variable costs are linearly and proportionally related with changes in the level of activity. However, recent studies investigate the complexity between costs and activities and document an asymmetric cost behavior. Noreen and Soderstrom (1994) are the first to examine whether costs change proportionally with changes in the level of activity by using cross-sectional data from hospitals in Washington state. They argue that overhead costs are not proportional to activity levels, although only a few of the differences are statistically significant. Inspired by Noreen and Soderstrom (1994), Anderson *et al.* (2003) conduct a more comprehensive investigation by examining the relation between selling, general and administrative (SG&A) costs and net sales revenue on US industrial firms from 1979 to 1998. They provide the first piece of strong evidence of the asymmetric cost behavior and characterize this cost behavior as "sticky." Moreover, they explore the drivers of cost stickiness and argue that sticky costs arise because managers deliberately adjust the resources committed to activities.

Following Anderson *et al.*'s (2003) seminal work, many studies focus on investigating the determinants of cost stickiness. Among them, one strand of literature aims at understanding how managerial deliberate decisions influence asymmetric cost behavior. For instance, Subramaniam and Weidenmier (2003) explore sticky cost behavior with respect to costs of goods sold (COGS) as well as SG&A and confirm that managers' asymmetric response to demand change drives cost stickiness in both cost categories. Banker, Ciftci, and Mashruwala (2008) shed new insight on the impact of deliberate decisions by examining the relation between managers' future belief of demand and cost stickiness. While Anderson *et al.* (2003) assume that managerial intervention only affects costs when sales decrease, Banker *et al.* (2008) further expand this assumption and show that managerial intervention affects costs in both directions, that is, when sales increase as well as when sales decrease.

In another dimension, Chen *et al.* (2012) focus on the managers' motivation of deliberate resource commitment decisions. They test how empire-building managers affect cost stickiness in response to exogenous demand shocks for firms in the S&P 500 index and show that empire-building managers tend to increase SG&A costs when sales rise but are reluctant to decrease these costs when sales fall, resulting in cost stickiness even in the absence of adjustment costs. Nevertheless, Kama and Weiss (2013) find contrary results and argue that managers' self-interest eliminates the sticky cost behavior. Such tendency is explained by the fact that managers are likely to cut slack resources when facing the pressure to meet earnings targets, even though they believe that the decline of sales is temporary.

Furthermore, prior studies also identify other factors contributing to the asymmetric cost behavior, both at the firm and country levels. For example, Anderson *et al.* (2003) and Balakrishnan *et al.* (2004) document that asset intensity, employee intensity and macroeconomic (GDP) growth are positively associated with the degree of cost stickiness. In addition, Venieris, Naoum, and Vlismas (2015) explore the potential relation between intangible investments and cost stickiness. They observe that SG&A costs in firms associated with a high proportion of intangible investments exhibit a sticky cost behavior while SG&A costs in firms associated with a low proportion of intangible investments exhibit an anti-sticky cost behavior.

Calleja *et al.* (2006) examine how corporate governance and legal system affect the stickiness of operating costs for listed firms in the UK, US, France and Germany and show that the French and Germany firms have stickier operating costs than the UK and US firms, suggesting that rigorous external scrutiny and managerial oversight weaken cost stickiness. Banker *et al.* (2013) investigate the relation between the degree of cost stickiness and

employment protection legislation strictness in 19 OECD countries and identify a positive relation. Their results indicate that employment protection legislations restrict firms' ability to cut slack labor resources when demand declines, which in turn increases the cost stickiness. Lee *et al.* (2020) provide the first piece of evidence that political uncertainty is an important determinant of cost stickiness, which is the closest work to our study. They find that political uncertainty created by national elections increases cost stickiness in 55 countries. However, they exclude China in their sample because it has a one-party system and therefore there is no national election uncertainty.

2.2 The economic impact of political uncertainty

A growing body of research investigates the importance of political uncertainty to economic activities and financial outcomes. Białkowski *et al.* (2008) and Boutchkova *et al.* (2012) examine stock market volatility around national elections and find that volatility is significantly higher in election years, suggesting that political uncertainty has adverse effects. Likewise, Pastor and Veronesi (2012) show that announcements of policy changes trigger a decline in stock prices and an increase in both volatility and risk premia. In addition, Kim, Pantzalis, and Park (2012) document that political geography has a pervasive effect on the cross-section of stock returns.

Besides its influence on the financial markets, political uncertainty also shapes corporate decisions. Julio and Yook (2012) examine the impact of national elections on the investment behavior of firms in 48 countries and find that firms reduce investment expenditures by an average of 4.8% during the election years relative to non-election years. An *et al.* (2016) reinforce Julio and Yook's (2012) argument by exploring the effect of political uncertainty on corporate investment at the local government level in China. They document that political turnover leads firms to significantly decrease investment expenditures. Instead of focusing on the overall corporate investment, Julio and Yook (2016) study the effect on a specific type of investment, that is, foreign direct investment (FDI). They show that FDI flows from US companies to foreign affiliates drop significantly in election years, that is the FDI rate declines by 14 to 21% on average. In addition, Feng & Johansson, 2017 explore the relation between political uncertainty and investments in activities related to innovation and document a negative relation between them. Unlike most studies, which use national or local elections as a measure of political uncertainty, Gulen and Ion (2016) employ the Economic Policy Uncertainty (EPU) index, which allows researchers to measure the actual level of political uncertainty at every point in time, to estimate the effect of policy uncertainty on corporate investment. Gulen and Ion (2016) find a strong negative relation between the aggregate level of uncertainty associated with future policy and regulatory outcomes and both firm and industry-level capital investments.

Xu *et al.* (2016) investigate the association between political uncertainty stemming from prefecture-city leadership changes and cash holdings for firms in China and show that firms hold less cash in turnover years relative to non-turnover years. This result is consistent with the "grabbing hand" hypothesis, that is, that politicians intend to extract resources from firms. When political turnover arises, a firm perceives the political uncertainty as just another opportunity for the newly appointed official to extract its assets, and hence firms respond by significantly reducing their cash holdings to minimize such risk. Ni (2019) extends Xu *et al.*'s (2016) study by documenting that firms significantly decrease cash holdings during the turnover periods and such effect concentrates in POEs.

According to recent studies, we can see that political uncertainty has an adverse effect on economic outcomes and financial activities. However, how political uncertainty affects corporate operational decisions is still not well understood. Our study extends the strand of research investigating the economic implications of political uncertainty to include cost

stickiness and provides a clear, cogent explanation of the importance of local political uncertainty on corporate operational decisions.

2.3 Political uncertainty and cost stickiness: hypothesis development

China's political system is a bureaucratic and hierarchical structure, consisting of five levels: central government, provinces, prefecture-level cities, counties and townships (Yao & Zhang, 2015). The Chinese Communist Party (CCP) is the head of this "multidivisional system," and ultimately determines policies, operations and appointments of central and local government officials (Xu *et al.*, 2016). Under this hierarchical system, the central government determines national economic plans and policies, and the local governments carry out those plans and policies. However, within a decentralized economic system in China, local government officials have a high degree of autonomy in their jurisdiction. For example, they decide land usage, set up business rules, codes and regulations, and provide investment opportunities and financial credits for local firms (Bai *et al.*, 2020). These policies strongly affect firms' daily operations. Thus, the profound political uncertainty touches them deeply and complicates their operational decisions.

Political uncertainty stemming from local government official turnover affects corporate operations in two ways. First, prefecture-city official turnover has a direct impact on managers' resource adjustments decisions. These decisions naturally shape cost behavior, including cost stickiness. In China's governmental hierarchy, local officials' superiors evaluate them based on conformance to tasks and targets, and local economic growth largely dictates local officials' opportunities for career advancement (Li & Zhou, 2005). As such, they normally have strong incentives to set their own goals and strategies to boost local economic growth. When local officials' superiors pursue their political and social objectives, they routinely exercise power to favour potential socio-economic projects that will benefit their careers. Since not all officials agree about which projects will help them realize their career goals, policies and projects may well cease following a turnover. Local firms may therefore delay making decisions until some or all of the policy uncertainty is resolved. In terms of corporate operations, the decisions refer to capacity choices and resource adjustments. The intuition is that managers are not sure whether their goods or service still align with officials' political and social objectives when prefecture-city leadership changes. The new leaders may have very different policy preferences and favored economic outcomes compared with the departing leaders. As Julio and Yook (2012, 2016) note, the value of waiting increases when uncertainty related to changes in government policy is high. As a result, managers are likely to hold slack resources although the demand declines during this high uncertainty period, which in turn increases the degree of cost stickiness.

Second, political uncertainty arising from government official turnover weakens the firm's existing political connections, which affects its operational decisions. Research undertaken in various countries documents those political connections enhance firms' operations and increase their value (e.g. Fisman, 2001; Faccio, 2006; Faccio, Masulis, & McConnell, 2006). Likewise, political connections are crucial for firms to do business in China (e.g. Xu, Yuan, Jiang, & Chan, 2015; Xu *et al.*, 2016; Chen *et al.*, 2018). Due to the bureaucratic structure in China, politics and politicians play an important and profound role in the Chinese economy and business activities. Businesses need to cultivate and maintain good relationships with ruling politicians for policy protection and other economic benefits. The resulting relational economy leads firms to pay special attention to political uncertainty (Xu *et al.*, 2016). Thus, managers are likely to slow business growth and retain the existing resources until they make connections with, or at least discover the policy preferences of, new local government officials. This is likely to increase cost stickiness.

According to the above discussion, we hypothesize:

H1. Cost stickiness is greater in turnover years than in non-turnover years.

If political uncertainty drives the degree of cost stickiness, its impact is likely to vary across different regions. The imbalances of economic development in China's eastern, central and western regions lead to a significant difference in policy, tax distortions and institutional environment (Allen, Qian, & Qian, 2005). On the one hand, Feng & Johansson, 2017 find that political effect on business is more pervasive in weak institutional environments, which amplifies the political uncertainty associated with government official turnover. On the other hand, Lee *et al.* (2020) document that firms in countries with less democracy and weaker institutions are less sensitive to political uncertainty. They argue that wide government policy swings are relatively scarce in countries with weak institutional environments. Following this logic, the government officials in regions with weak institutions may be unlikely to make significant changes in existing policies unless the central government officials request them to do so, lowering political uncertainty. As it is hard to predict the direction of the effect of institutional environment on the relation between political uncertainty and cost stickiness, we formulate the following hypothesis without a directional prediction:

H2. The relationship between political uncertainty and cost stickiness is associated with the local institutional environment.

Besides the local institutional environment, the ownership structure may also influence the relationship between political uncertainty and cost stickiness. In China, the state maintains its controlling power over SOEs through equity holdings (Sun & Tong, 2003; Jiang & Kim, 2020). This makes SOEs more susceptible to political uncertainty. Because in addition to the usual political influence, their operational and personnel decisions are also under the influence of or even controlled by the local leaders, especially for SOEs that are controlled by local governments (Chen, Tang, Wu, & Yang, 2021; Guo, Pan, & Tian, 2021). As a result, strict government control and restriction continually affect firms' general operations and decision-making, leaving them more sensitive to political risk. As An *et al.* (2016) and Xu *et al.* (2016) have argued, political uncertainty has a much stronger effect on SOEs, as they are more politically connected. Thus, it is reasonable to expect that the effect of political uncertainty on stickiness is significantly stronger for SOEs.

In sharp contrast, Feng and Johansson (2017) and Ni (2019) document that the detrimental effect of political uncertainty is much stronger for POEs than for SOEs. The latter receive various economic benefits from both central and local governments, such as tax breaks on certain products, lower interest rates on loans, and financial support from the government (Hou, Kuo, & Lee, 2012). SOEs, which are embedded in the bureaucratic hierarchies, have maintained institutional connections to local governments and superior government knowledge to understand and foresee economic policies. Institutional connections are more stable than personal connections that POEs usually develop with local officials (Bai *et al.*, 2020; Hou & Li, 2020). When turnover occurs, POEs may lose their established political connections and face a higher policy risk [4]. In comparison, SOEs are less vulnerable to political uncertainty and more likely to continue their operations as normal. Thus, compared to SOEs, POEs are apt to be more sensitive to local official turnover, resulting in a greater impact of political uncertainty on cost stickiness. Again, there is no consensus on whether the impact of political uncertainty is stronger for SOEs or POEs. We, therefore, state the third hypothesis without a directional prediction:

H3. The relationship between political uncertainty and cost stickiness is related to ownership.

Firms with larger resource bases can take advantage of economies of scale and market power to drive down their costs, enabling them to recover from the costs of making operating mistakes more easily. As a result, large firms are better equipped than small ones to handle political uncertainty (Haveman *et al.*, 2017). Moreover, in a transitional economy like China, large firms have less exposure to regulations, taxes, fees and fines (Tsai, 2002), and have lower risks of government expropriation of assets (Li, Meng, Wang, & Zhou, 2008; Jiang & Kim, 2020). As such, the impact of local political turnover is expected to concentrate on small firms. Therefore, we make the fourth hypothesis with a directional prediction:

H4. The relationship between political uncertainty and cost stickiness is more pronounced in small firms.

3. Research design

3.1 Sample and data

We collect data in two stages. First, prefecture-city official turnover is used as our measure of political uncertainty. The two top leaders in a prefecture-city government are the party secretary and mayor. The administrative head structure in all Chinese localities means that both turnover of city heads and turnover of city mayors may affect corporate operations. For simplicity, we refer to them as the "city head" and "city mayor," respectively. We manually collect the turnover data of city heads and mayors from various public resources, such as official government websites, press releases, and newspapers [5]. The data contain detailed personnel information regarding each governor's name, age, education, previous working experience, and the timing and nature of the turnover and appointment.

Second, we obtain firm-level financial information from the China Stock Market Accounting Research (CSMAR) database for all non-financial firms listed on the Shanghai Stock Exchange and Shenzhen Stock Exchange from 1998 to 2018 [6]. In addition, we source the national-level inflation rate, city-level annual real GDP growth rate, and city-level unemployment rate from the CEIC database.

Following Banker *et al.* (2013), our initial sample meets the following criteria: (1) the firm must have valid sales, assets, and operating costs over the past two years; (2) we exclude firms with extreme operating costs (i.e. operating costs which are under 50% or exceed 200% of sales over the past two years); (3) we exclude firm-years with extreme sales (i.e. when sales rose by more than 50% or fell by more than 33% in the past two years) since these large shifts in sales likely capture unusual events such as mergers or divestitures. We further exclude firms located in Beijing, Shanghai, Tianjin, and Chongqing, which are cities directly controlled by the Chinese central government. We then assign each listed firm to a particular city based on the location of its headquarter. Combining firm-level information with prefecture-city official turnover data for 260 cities (including 1,206 heads and 1,346 mayors), our final sample consists of 20,392 firm-year observations from 2000 to 2018 [7].

3.2 Measure of political uncertainty

The key variable of interest for this study is political uncertainty. Prefecture-city official turnover provides an ideal measure for two main reasons: (1) prefectural-level governments are the lowest hierarchy that has the right to make local policies and rules and thus they have a substantial impact on firms' operation; (2) prefectural-level governments are also the highest hierarchy that has direct impacts on local economic affairs, such as urban infrastructure development and urban land usage and supply. Many of these affairs touch on daily business operations. Furthermore, many prefectural-level government officials serve for very short periods although their nominal term is typically five years (Ni, 2019). Finally,

using prefectural-level rather than province-level turnover can help us better control for local economic conditions with a matched sample approach. We, therefore, take advantage of the frequent prefecture-city official turnover in China. We construct a dummy variable *TURNOVER* to indicate the nature of prefecture-city official turnover. *TURNOVER* is equal to one if either the city head or mayor is changed in year t, and zero otherwise. Also considering the inauguration date of the new official, if an official change occurs in the first (second) half of year t, the turnover is considered as occurring in year t (year $t+1$) because it takes time for the new official to exert any influence on the local economy (Li & Zhou, 2005).

3.3 Empirical model

To test our hypotheses, we augment Anderson *et al.*'s (2003) model by including the interaction terms of the prefecture-city official turnover, *TURNOVER*. In addition, we explicitly control for firm-level characteristics that are known to affect the degree of cost stickiness, including asset intensity, employee intensity, and an indicator for the prior sales decline. Furthermore, the model also includes the interaction terms of two prefecture-city level economic factors, i.e. GDP growth and unemployment rate. To test the impact of political uncertainty on cost stickiness, our baseline model is shown as below [8]:

$$\begin{aligned}\Delta lnXOPR_{n,i,t} = {} & \beta_0 + (\beta_1 + \beta_2 TURNOVER_{n,t} + \beta_3 GDP_{n,t} + \beta_4 UNEMP_{n,t} + \beta_5 lnANIT_{n,i,t} \\ & + \beta_6 lnEMPINT_{n,i,t})\Delta lnSALE_{n,i,t} + (\beta_7 + \beta_8 TURNOVER_{n,t} + \beta_9 GDP_{n,t} \\ & + \beta_{10} UNEMP_{n,t} + \beta_{11} lnANIT_{n,i,t} + \beta_{12} lnEMPINT_{n,i,t} \\ & + \beta_{13} LAGD_{n,i,t})D_{n,i,t} \times \Delta lnSALE_{n,i,t} + \varepsilon_{n,i,t}\end{aligned} \tag{1}$$

where the subscripts n, i and t index prefecture-city, firm and year; $\Delta lnXOPR$ is the log-change in operating costs; $\Delta lnSALE$ is the log-change in deflated sales; *TURNOVER* is the prefecture-city official turnover as defined earlier; *GDP* is the prefecture-city's GDP growth rate; *UNEMP* is the prefecture-city's unemployment rate; *lnANIT* is asset intensity defined as the log ratio of assets to sales revenue; *lnEMPINT* is employee intensity defined as the log ratio of the number of employees to sales; D is a dummy variable that equals to one if deflated sales decrease in year t, and zero otherwise; *LAGD* is an indicator for a decline in prior sales that equals to one if sales decreased in year $t-1$, and zero otherwise. Recall that a negative sign of the coefficient of $\Delta lnSALE_{n,i,t} \times D_{n,i,t}$ indicates the sticky behavior of operating costs.

Under our H1, we expect that the coefficient estimation for β_8 is significantly negative, implying the positive relationship between political uncertainty and cost stickiness. In addition, we expect $\beta_9 < 0$ and $\beta_{10} > 0$ because managers are likely to regard sales decreases as transitory (permanent) and adjust committed resources downward to a smaller (larger) degree when the economic condition is strong (poor). As Anderson *et al.* (2003) note, asset intensity, and employee intensity are empirical proxies for the magnitude of adjustment costs faced by the firm. Accordingly, we expect $\beta_{11} < 0$ and $\beta_{12} < 0$, to the extent that both capture the magnitude of downward adjustment costs. Finally, we expect $\beta_{13} > 0$, given that managers have a pessimistic expectation regarding future sales when sales decline occurs in successive periods, which in turn decreases the degree of cost stickiness.

4. Empirical results

4.1 Descriptive statistics

We present the distribution of sample observations by year from 2000 to 2018 in Panel A of Table 1. The sample period encompasses 20,392 firm-year observations, with the most (2,060)

Panel A: Sample distribution by year

Year	No. of observations	No. of cities	No. of provinces
2000	457	152	27
2001	521	166	28
2002	588	168	28
2003	649	179	28
2004	661	182	28
2005	739	197	28
2006	813	203	28
2007	770	196	28
2008	853	196	28
2009	926	205	28
2010	939	214	28
2011	1,092	212	28
2012	1,364	227	28
2013	1,539	229	28
2014	1,616	234	28
2015	1,562	229	28
2016	1,599	235	28
2017	1,644	227	28
2018	2,060	244	28
Total	20,392	260	28

Panel B: Distribution of prefecture-city official turnover by year

Year	Head turnover (%)	Mayor turnover (%)	Head or mayor turnover (%)	Head and mayor turnover (%)
2000	22.98	28.45	40.92	10.50
2001	28.98	32.25	40.50	20.73
2002	34.86	29.76	51.19	13.44
2003	37.29	49.31	61.94	24.65
2004	14.98	13.16	23.15	4.99
2005	30.72	26.12	40.19	16.64
2006	15.62	20.79	26.69	9.72
2007	29.74	38.83	49.48	19.09
2008	36.34	26.14	45.60	16.88
2009	9.07	16.09	20.95	4.21
2010	23.75	22.36	34.29	11.82
2011	28.02	33.06	43.59	17.49
2012	34.24	35.48	46.48	23.24
2013	28.91	32.75	44.64	17.02
2014	13.99	14.73	23.76	4.95
2015	36.94	24.14	52.62	8.45
2016	32.40	29.39	45.53	16.26
2017	53.71	43.19	72.26	24.64
2018	38.70	46.96	64.31	21.35
Average	29.01	29.63	43.58	15.06

Table 1. Sample description

Note(s): This table presents the sample distribution by year (Panel A) and the distribution of prefecture-city official turnover by year (Panel B) over the period 2000–2018

in 2018 and the least (457) in 2000. Panel B presents the distribution of prefecture-city official turnover ratio by year. The average turnover ratios of city heads and city mayors are 29.01 and 29.63%, respectively [9]. In column (3), we report the distribution of the key variable *TURNOVER*. The five highest turnover years are 2002, 2003, 2015, 2017 and 2018, and most surround the national election years (2002, 2007, 2012 and 2017). This pattern raises a

potential concern that the prefecture-city official turnover captures the national election effect. We address this concern later in the section of robustness checks.

Table 2 presents the summary statistics for key variables used in this study. All the continuous variables are winsorized at the top and bottom 1% of their respective distributions to mitigate the effect of outliers. The mean (median) of $\Delta lnXOPR$ is 0.092 (0.102), indicating that the mean (median) percentage increase in operating costs is 9.6 (10.7). The mean (median) of $\Delta lnSALE$ is 0.085 (0.098), implying that the mean (median) percentage increase in sales is 8.9 (10.3). In our sample, 28% of the firm-year observations experience sales declines, as shown by the mean value of the variable, *D*. This figure is comparable to that of prior studies in the context of Chinese firms. For example, Gu *et al.* (2020) report that 30% of sample firms experience a sales decrease from 1999 to 2011. Moreover, *TURNOVER* has a mean of 0.449 with a standard deviation of 0.498, suggesting frequent turnover. In terms of the local economic condition of the prefecture-cities, the average GDP growth rate, and unemployment rate are 10.9 and 3.0%, respectively. On average, the sample firm has an asset intensity of 0.619 and an employee intensity of 0.276.

4.2 Main results

Table 3 presents the results of our main analysis. Prior to formally testing the impact of political uncertainty on cost stickiness, we initially estimate Anderson *et al.*'s (2003) model to provide some preliminary evidence of asymmetric cost behavior as reported by Anderson *et al.* (2003). The testing result is reported in column (1). Consistent with the sticky cost hypothesis, the coefficient of the interaction term between $\Delta lnSALE_{n,i,t}$ and $D_{n,i,t}$ is negative and significant at the 1% level (−0.042 with $t = -5.178$), suggesting that the operating costs of Chinese firms are sticky on average. In column (2), we present the results of testing the effect of political uncertainty with our baseline model. The main parameter of interest is β_8, which captures the association between political uncertainty and the degree of cost stickiness. The estimated β_8 is significantly negative at the 1% level (−0.028 with $t = -2.761$). This result is consistent with H1, indicating that the degree of cost stickiness increases when political turnover arises. In other words, political uncertainty and cost stickiness have a positive association. Additionally, we find that the results for control variables are generally consistent with expectations. The degree of cost stickiness increases with cities' GDP growth, asset intensity, and employee intensity and decreases with cities' unemployment rate. Furthermore, managers tend to regard sales decreases in two consecutive years as permanent and therefore adjust committed resources downwards to a larger degree.

	N	Mean	SD	25%	Median	75%
$\Delta lnXOPR_{n,i,t}$	20,392	0.092	0.180	−0.012	0.102	0.214
$\Delta lnSALE_{n,i,t}$	20,392	0.085	0.170	−0.018	0.098	0.207
$D_{n,i,t}$	20,392	0.280	0.449	0	0	1
$TURNOVER_{n,t}$	20,392	0.449	0.498	0	0	1
$GDP_{n,t}$	20,392	0.109	0.036	0.081	0.104	0.135
$UNEMP_{n,t}$	20,392	0.030	0.034	0.023	0.029	0.035
$lnANIT_{n,i,t}$	20,392	0.619	0.672	0.205	0.597	1.005
$lnEMPINT_{n,i,t}$	20,392	0.276	0.988	−0.261	0.356	0.897
$LAGD_{n,i,t}$	20,392	0.251	0.433	0	0	1

Note(s): This table reports summary statistics for the major variables used in the empirical analysis. The subscripts *n*, *i* and *t* denote city, firm, and year indices, respectively. All variables are defined in the Table A1

Table 2.
Summary statistics

	Exp. sign	(1)	(2)
$\Delta lnSALE_t$	+	0.995*** (144.039)	0.987*** (76.564)
$\Delta lnSALE_t \times D_t$	−	−0.042*** (−5.178)	−0.102*** (−4.285)
$\Delta lnSALE_t \times TURNOVER_t$			−0.007 (−1.531)
$\Delta lnSALE_t \times D_t \times TURNOVER_t$	−		−0.028*** (−2.761)
$\Delta lnSALE_t \times GDP_t$			0.136* (1.815)
$\Delta lnSALE_t \times UNEMP_t$			−0.063 (−0.740)
$\Delta lnSALE_t \times lnANIT_t$			0.005 (1.261)
$\Delta lnSALE_t \times lnEMPINT_t$			0.001 (0.476)
$\Delta lnSALE_t \times D_t \times GDP_t$	−		−0.551** (−2.380)
$\Delta lnSALE_t \times D_t \times UNEMP_t$	+		0.938* (1.716)
$\Delta lnSALE_t \times D_t \times lnANIT_t$	−		−0.025*** (−3.379)
$\Delta lnSALE_t \times D_t \times lnEMPINT_t$	−		−0.038*** (−7.275)
$\Delta lnSALE_t \times D_t \times LAGD_t$	+		0.044*** (4.808)
Intercept		0.004*** (5.368)	0.004*** (5.493)
Year fixed effect		Yes	Yes
Firm fixed effect		Yes	Yes
Observations		20,392	20,392
Adjusted R^2		0.857	0.778

Note(s): This table presents the results of testing the impact of political uncertainty on the asymmetric behavior of operating costs. The dependent variable is $\Delta lnXOPR$, the log-change in deflated operating costs. Column (1) presents the basic results of testing the presence of cost stickiness. Column (2) adds the key variable, prefecture-city official turnover *TURNOVER*, into the analysis. *TURNOVER* is a dummy variable that takes the value of one if either the city head or mayor is changed in year *t*, and zero otherwise. $\Delta lnSALE$ is the log-change in deflated sales. *D* is a dummy variable that takes the value of one if sales decrease, and zero otherwise. Control variables include firm characteristics and local economic factors. All variables are defined in the Table A1. Robust *t*-statistics reported in parentheses are based on standard errors clustered by firm. In this table, *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively

Table 3.
Political uncertainty and asymmetry of operating costs

In addition to being statistically significant, our test results are also economically material. Recall that the estimated β_8 is −0.028. In our sample, the average sales revenue is 5011.83 million RMB and the average operating costs are 4,325.97 million RMB. This coefficient estimate implies that a 1% (corresponding to 50.12 million RMB) decrease in sales revenue leads to a 1,211,272 RMB increase in sticky operating costs in turnover years relative to non-turnover years. This estimation reveals that political uncertainty is economically significant to increase the asymmetric cost behavior, and thus illustrates the economic materiality of our baseline results.

4.3 Endogeneity and further robustness checks

In this section, we conduct a set of tests to reinforce the consistency and reliability of the baseline results. Our tests involve an instrumental variable approach, placebo tests, matched sample approach, using alternative specifications and measures of explanatory variables and dependent variables, and controlling the anti-corruption campaign and national election effect.

4.3.1 Addressing potential endogeneity concern. Although we have controlled a number of variables in the baseline regression, endogeneity is still possible between political uncertainty and cost stickiness. As Rodrik (1991) notes, it is very difficult to find strong empirical support for uncertainty-driven predictions because political instability and uncertainty are likely endogenous to other factors that affect firms' investment and operating decisions. Estimating the direction of causality between economic outcomes and policy uncertainty requires employing a variable or event that is correlated with policy uncertainty but uncorrelated with

the economic conditions that drive cost stickiness. Typically, the tenure of government officials in China is fixed at five years. However, unobservable time-varying local economic factors might still drive both government official turnover and the asymmetric cost behavior. In such a case, the observed relationship between political uncertainty and cost stickiness could be spurious.

To address the potential endogeneity issue, we first apply an instrumental variable (IV) analysis approach. Referring to the study by Ni (2019), we use two IVs for local official turnover: local government officials' age (*AGE*) and the mean value of official turnover of other cities in the same province (*TURNOVER_PEER*) [10]. These variables affect the probability of government official turnover but are not directly related to the changing of the firm-level behavior of operating costs. We first introduce two dummy variables: *TURNOVER_HEAD* and *TURNOVER_MAYOR*. *TURNOVER_HEAD* is equal to one if the city head is replaced in year t, and zero otherwise, and *TURNOVER_MAYOR* is equal to one if the city mayor is replaced in year t, and zero otherwise. Because our endogenous variables in the regression are $\Delta lnSALE \times TURNOVER\_HEAD$ ($\Delta lnSALE \times TURNOVER\_MAYOR$) and $\Delta lnSALE \times D \times TURNOVER\_HEAD$ ($\Delta lnSALE \times D \times TURNOVER\_MAYOR$), we use $\Delta lnSALE_t \times AGE$, $\Delta lnSALE_t \times D_t \times AGE$, $\Delta lnSALE_t \times TURNOVER\_PEER$, and $\Delta lnSALE_t \times D_t \times TURNOVER\_PEER$ as IVs. Next, we regress these two endogenous variables on the IVs and control variables used in the baseline model for the cases of head turnover and mayor turnover, respectively. Columns (1) and (2) of Panel A of Table 4 report the first-stage regression results for the setting of head turnover. The IVs are significantly related to the endogenous variables at the 1% level, suggesting that the IVs are relevant. In the second-stage regression, we replace the endogenous variables with the predicted values of $\Delta lnSALE \times TURNOVER\_HEAD$ and $\Delta lnSALE \times D \times TURNOVER\_HEAD$ from the first-stage regression and re-run the baseline regression [11]. The results reported in columns (3) imply that the positive relation between political uncertainty and cost stickiness continues to hold after correcting for the endogeneity bias. In Panel B, we conduct the same analysis for the turnover of mayors and reach the same conclusion.

To further ally the endogeneity concern, we conduct a placebo test to verify whether the results remain the same in the absence of prefecture-city official turnover. Following Xu *et al.* (2016), for each political uncertainty event due to prefecture-city official turnover, we assume that the event recurs for the same firm in the next three years in the same city. We set up a simulated dummy variable for each year (using the same procedure as for *TURNOVER*). The three dummy variables are denoted as *TURNOVER*1, *TURNOVER*2 and *TURNOVER*3 for years $t+1$, $t+2$ and $t+3$, respectively. Then, we use these simulated variables to replace *TURNOVER* and re-regress the baseline model for each of the three simulated variables. If political uncertainty is the cause of the increase in the degree of cost stickiness, we expect that the coefficients of *TURNOVER*1, *TURNOVER*2 and *TURNOVER*3 are statistically insignificant. This is because, in years $t+1$, $t+2$ and $t+3$, political uncertainty arising from local official turnover no longer exists and thus there is no significant change in cost stickiness. The regression results appear in Table 5. We find that the coefficients on $\Delta lnSALE_{n,i,t} \times D_{n,i,t} \times TURNOVER1_{n,t}$, $\Delta lnSALE_{n,i,t} \times D_{n,i,t} \times TURNOVER2_{n,t}$ and $\Delta lnSALE_{n,i,t} \times D_{n,i,t} \times TURNOVER3_{n,t}$ are insignificant, which is consistent with our expectation. We can therefore conclude that political uncertainty due to prefecture-city official turnover has a casual impact on cost stickiness.

4.3.2 Controlling for the anti-corruption campaign and national election effect. In November of 2012, China initiated the largest and most pervasive anti-corruption regulation in the history of modern China (Pan & Tian, 2020), creating a significant increase in political uncertainty (Stanfield, Zhang, & Zhang, 2019) [12]. To address the concern about the impact of this campaign, we split our sample into two shorter time periods, 2000–2012 and

Variable	First stage		Second stage
	$\Delta lnSALE_t \times TURNOVER_t$ (1)	$\Delta lnSALE_t \times D_t \times TURNOVER_t$ (2)	$\Delta lnXOPR$ (3)
Panel A: Turnover of city heads			
$\Delta lnSALE_t \times AGE$	*−0.979*** (−17.283)		
$\Delta lnSALE_t \times TURNOVER\_PEER$	*0.278*** (22.007)		
$\Delta lnSALE_t \times D_t \times AGE$		*−1.299*** (−22.749)	
$\Delta lnSALE_t \times D_t \times TURNOVER\_PEER$		*0.204*** (15.846)	
$\Delta lnSALE_t$	4.274*** (18.819)	−0.004 (−0.521)	0.969*** (44.108)
$\Delta lnSALE_t \times D_t$	−0.015 (−0.365)	5.579*** (24.336)	−0.077*** (−3.509)
$\Delta lnSALE_t \times TURNOVER\_HEAD_t$			−0.025 (−0.725)
$\Delta lnSALE_t \times D_t \times TURNOVER\_HEAD_t$			*−0.188*** (−3.522)
Control	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes
Observations	20,392	20,392	20,392
Adjusted R^2	0.311	0.315	0.735
Panel B: Turnover of city mayors			
$\Delta lnSALE_t \times AGE$	*−0.979*** (−18.895)		
$\Delta lnSALE_t \times TURNOVER\_PEER$	*0.162*** (12.606)		
$\Delta lnSALE_t \times D_t \times AGE$		*−1.197*** (−22.012)	
$\Delta lnSALE_t \times D_t \times TURNOVER\_PEER$		*0.097*** (7.391)	
$\Delta lnSALE_t$	4.283*** (20.729)	0.000 (0.043)	0.978*** (62.703)
$\Delta lnSALE_t \times D_t$	−0.025 (−0.585)	5.156*** (23.642)	−0.093*** (−2.652)
$\Delta lnSALE_t \times TURNOVER\_MAYOR_t$			0.011 (0.411)
$\Delta lnSALE_t \times D_t \times TURNOVER\_MAYOR_t$			*−0.106*** (−2.336)
Control	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes
Observations	20,392	20,392	20,392
Adjusted R^2	0.296	0.311	0.680

Note(s): This table presents the results of 2SLS regressions. We use local officials' age (*AGE*) and the mean value of official turnover of other cities in the same province (*TURNOVER_PEER*) as instrumental variables for local official turnover. In the first stage, we regress endogenous variables $\Delta lnSALE_t \times TURNOVER_t$ and $\Delta lnSALE_t \times D_t \times TURNOVER_t$ on $\Delta lnSALE_t \times AGE$, $\Delta lnSALE_t \times TURNOVER\_PEER$, $\Delta lnSALE_t \times D_t \times AGE$, $\Delta lnSALE_t \times D_t \times TURNOVER\_PEER$ and control variables used in the baseline model. In the second stage, we replace $\Delta lnSALE_t \times TURNOVER_t$ and $\Delta lnSALE_t \times D_t \times TURNOVER_t$ by their predicted values from the first stage and re-run the baseline regression. Panel A reports the estimation results based on the turnover of city heads and Panel B reports the estimation results based on the turnover of city mayors. The subscript t denotes the time index, while prefecture-city and firm indices are omitted for brevity. The dependent variable is $\Delta lnXOPR$, the log-change in operating costs. $\Delta lnSALE$ is the log-change in sales. D is a dummy variable that takes the value of one if sales decrease, and zero otherwise. *TURNOVER_HEAD* is a dummy variable that takes the value of one if the city head is changed in year t, and zero otherwise. *TURNOVER_MAYOR* is a dummy variable that takes the value of one if the city mayor is changed in year t, and zero otherwise. All variables are defined in the Table A1. Regressions control for both firm and year fixed effects. Robust t-statistics reported in parentheses are based on standard errors clustered by firm. In this table, *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively

Table 4.
Political uncertainty and asymmetry of operating costs: instrumental variable approach

2013–2018, and re-estimate the baseline model separately for each subsample. The results are reported in columns (1) and (2) of Panel A of Table 6. The coefficient estimates for β_8 are significantly negative in both subsamples, suggesting no particular episode or outlier drives the impact of local political uncertainty.

There were four national elections during our sample period (2002, 2007, 2012 and 2017). As shown in Panel B of Table 1, the national election may influence prefecture-city official turnover. To alleviate the concern that firms may adjust their operational decisions in anticipation of these elections and of any resulting political turnover, we remove the observations in 2002, 2007, 2012 and 2017 and re-run the baseline model to assess our main results. Column (3) shows that the coefficient estimate for β_8 is still significantly negative (at

	(1)	(2)	(3)
$\Delta lnSALE_t$	0.962*** (69.915)	0.964*** (70.168)	0.965*** (70.154)
$\Delta lnSALE_t \times D_t$	−0.145*** (−3.063)	−0.143*** (−3.013)	−0.153*** (−3.223)
$\Delta lnSALE_t \times TURNOVER1_t$	0.017* (1.801)		
$\Delta lnSALE_t \times D_t \times TURNOVER1_t$	*0.009* (0.443)		
$\Delta lnSALE_t \times TURNOVER2_t$		0.006 (0.373)	
$\Delta lnSALE_t \times D_t \times TURNOVER2_t$		*−0.025* (−1.169)	
$\Delta lnSALE_t \times TURNOVER3_t$			0.008 (0.704)
$\Delta lnSALE_t \times D_t \times TURNOVER3_t$			*−0.037* (−1.063)
Control	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes
Observations	20,392	20,392	20,392
Adjusted R^2	0.777	0.777	0.777

Note(s): This table presents the results of a placebo test. For each political uncertainty event, we assume that the event happens again in the next three years and set up a simulated dummy variable for each year. The three dummy variables are denoted as *TURNOVER*1, *TURNOVER*2, and *TURNOVER*3. The subscript *t* denotes the time index, while prefecture-city and firm indices are omitted for brevity. The dependent variable is Δ*lnXOPR*, the log-change in operating costs. Δ*lnSALE* is the log-change in sales. *D* is a dummy variable that takes the value of one if sales decrease, and zero otherwise. *TURNOVER* is a dummy variable that takes the value of one if either the city head or mayor is changed in year *t*, and zero otherwise. All variables are defined in the Table A1. Regressions control for both firm and year fixed effects. Robust *t*-statistics reported in parentheses are based on standard errors clustered by firm. In this table, *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively

Table 5. Political uncertainty and asymmetry of operating costs: a placebo test

the 5% level) in non-election years, reinforcing that political uncertainty stemming from government official turnover increases cost stickiness for local firms.

4.3.3 A matched sample approach. Following Çolak *et al.* (2017) and Lee *et al.* (2020), we also use a matched sample approach. For each firm-year that experiences political uncertainty (treatment firm-year), we match a firm-year that does not experience political turnover, is from the same industry and province, and has similar magnitudes of control variables used in Equation (1) based on the propensity score matching approach [13]. As such, we have two groups of firms with similar fundamentals and economic conditions but only the treatment firms face an increased political uncertainty due to local official turnover. Thus, we can control for other factors that could affect a firm's asymmetric cost behavior. We estimate Equation (1) using the two groups and report the results in column (4) of Panel A of Table 6 [14]. We find that the coefficient on $\Delta lnSALE_{n,i,t} \times D_{n,i,t} \times TURNOVER_{n,t}$ is negative and significant at the 5% level, similar to our main results reported in column (2) of Table 3.

4.3.4 Alternative specifications of explanatory variables. We also use alternative specifications of political turnover for robustness. In a Chinese municipality, the city head and the mayor could have a different impact on local businesses. In each prefecture government, the party secretary is the highest-ranking official empowered with decision-making rights on key political and economic matters, followed by the administrative head, to ensure the CCP has full control (Chen *et al.*, 2021). Thus, the communist party secretary has more power than the mayor at the prefecture-city level, and the turnover of the city head may have a greater impact than the turnover of mayors. To examine different effects of city heads and mayors, we re-regress the baseline model in terms of different explanatory variables: *TURNOVER_HEAD*, *TURNOVER_MAYOR*, and *TURNOVER_BOTH*. *TURNOVER_HEAD* and *TURNOVER_MAYOR* are defined as earlier, and *TURNOVER_BOTH* is equal to one if both the city head and mayor are replaced in year *t*, and zero otherwise. We expect that the parameter of interest, β_8, is still significantly negative in new estimations. The test results are reported in Panel B of

Panel A: Alternative subsamples

	Pre anti-corruption campaign (1)	Post anti-corruption campaign (2)	Excluding election years (3)	Matched sample analysis (4)
$\Delta lnSALE_t$	1.005*** (59.382)	1.040*** (46.898)	0.991*** (68.681)	0.979*** (76.840)
$\Delta lnSALE_t \times D_t$	−0.032*** (−2.773)	−0.208*** (−4.698)	−0.094*** (−3.397)	−0.120*** (−4.211)
$\Delta lnSALE_t \times TURNOVER_t$	−0.018*** (−2.782)	0.005 (0.777)	−0.005 (−0.940)	−0.004 (−0.736)
$\Delta lnSALE_t \times D_t \times TURNOVER_t$	−0.020** (−2.148)	−0.037*** (−2.563)	−0.024** (−2.049)	−0.027** (−2.372)
Control	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes
Observations	10,372	10,020	16,026	11,140
Adjusted R^2	0.775	0.777	0.775	0.675

Panel B: Alternative explanatory variables

	TURNOVER_HEAD (1)	*TURNOVER_MAYOR* (2)	*TURNOVER_BOTH* (3)
$\Delta lnSALE_t$	0.984*** (76.922)	0.988*** (77.469)	0.986*** (79.655)
$\Delta lnSALE_t \times D_t$	−0.104*** (−4.437)	−0.116*** (−4.980)	−0.117*** (−5.103)
$\Delta lnSALE_t \times TURNOVER\_HEAD_t$	−0.006 (−1.214)		
$\Delta lnSALE_t \times D_t \times TURNOVER\_HEAD_t$	*−0.034*** (−3.078)		
$\Delta lnSALE_t \times TURNOVER\_MAYOR_t$		−0.013** (−2.508)	
$\Delta lnSALE_t \times D_t \times TURNOVER\_MAYOR_t$		*−0.019** (−1.741)	
$\Delta lnSALE_t \times TURNOVER\_BOTH_t$			−0.018*** (−2.695)
$\Delta lnSALE_t \times D_t \times TURNOVER\_BOTH_t$			*−0.035*** (−2.474)
Control	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes
Observations	20,392	20,392	20,392
Adjusted R^2	0.777	0.778	0.778

Panel C: Alternative dependent variables

	Dependent variable			
	$\Delta XOPR_t$ (1)	$\Delta lnSG\&A_t$ (2)	$\Delta lnR\&D_t$ (3)	$\Delta lnCOGS_t$ (4)
$\Delta lnSALE_t$	0.987*** (76.564)	0.677*** (21.901)	0.620*** (23.987)	0.999*** (63.775)
$\Delta lnSALE_t \times D_t$	−0.102*** (−4.285)	−0.440*** (−5.646)	−0.115* (−1.722)	−0.024*** (−2.912)
$\Delta lnSALE_t \times TURNOVER_t$	−0.007 (−1.531)	0.003 (0.228)	−0.003 (−0.205)	−0.011** (−2.090)
$\Delta lnSALE_t \times D_t \times TURNOVER_t$	*−0.028*** (−2.761)	*−0.105*** (−4.468)	*−0.038*** (−2.176)	*−0.015** (−1.830)
Control	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes
Observations	20,392	20,392	20,392	20,392
Adjusted R^2	0.778	0.235	0.032	0.766

Note(s): This table presents the results of several robustness checks on the impact of political uncertainty on the asymmetric behavior of operating costs. In Panel A, we conduct a set of subsample analyses, including anti-corruption campaign effect, national election effect, and matched sample analysis. In Panel B, we test the impact of political uncertainty on asymmetric behavior of operating costs in terms of alternative specifications of political turnover. In Panel C, we test the baseline results in terms of alternative dependent variables. The subscript t denotes the time index, while prefecture-city and firm indices are omitted for brevity. $\Delta lnSALE$ is the log-change in sales. D is a dummy variable that takes the value of one if sales decrease, and zero otherwise. All variables are defined in the Table A1. Regressions control for both firm and year fixed effects. Robust t-statistics reported in parentheses are based on standard errors clustered by firm. In this table, *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively

Table 6.
Robustness checks

Table 6. From the table, we can see that the coefficient estimation for β_8 is significantly negative when using different political turnover variables, confirming the positive relationship between political uncertainty and cost stickiness. Moreover, the coefficient on $\Delta lnSALE_{n,i,t} \times D_{n,i,t} \times TURNOVER\_HEAD_{n,t}$ is more negative than the coefficient on $\Delta lnSALE_{n,i,t}$

$\times D_{n,i,t} \times TURNOVER\_MAYOR_{n,t}$, evidence that the turnover of city heads has a greater influence on local firms than the turnover of city mayors.

4.3.5 Alternative measures of dependent variables. The analysis thus far has been focused on a composite measure of operating costs. To reinforce our baseline results, we then study whether the supportive results can be found in other sub-cost categories, i.e. selling, general, and administrative (*SG&A*) costs, research, and development expenses (*R&D*), cost of goods sold (*COGS*). Hence, we re-estimate the baseline model by using different dependent variables and examine the coefficient on the variable of interest, $\Delta lnSALE_{n,i,t} \times D_{n,i,t} \times TURNOVER_{n,t}$ (β_8). The results are reported in Panel C of Table 6. We find that the coefficient estimates for β_8 are consistently significantly negative, implying that the impact of political uncertainty applies to all the sub-operating cost categories. Overall, our findings indicate that firms react to the local political turnover by making all the resources related to these cost categories slack. This is reasonable as these costs are generally irreversible and are therefore sensitive to political uncertainty (Julio & Yook, 2016; Lee *et al.*, 2020).

4.4 Cross-sectional variation

So far in the analyses, we document a positive effect of political uncertainty on cost stickiness. However, this effect may vary with different local institutional environments, firms' ownership structure, and firm size. Thus, in this section, we turn to focus on the potential drivers behind the relationship between political uncertainty and cost stickiness and examine H2–H4.

4.4.1 The effect of the local institutional environment. To test H2, we add the interaction terms of the institutional environment into the baseline model. While it is usually difficult for a single country study to identify such impact, China offers a rare opportunity as significant variations in institutional environments exhibit both across regions and over time. We use the National Economic Research Institute Marketization index proposed by Fan, Wang, and Zhu (2011) as a proxy for the local institutional environment. The index measures the levels of institutional development in the 31 provinces of China and the institutional development level is assessed in five fields by a total of 23 indicators [15]. For each year, we rank firms based on the Marketization index of their registration location (provincial level) and assign to the weak (strong) institutional environment group those firms below (above) the median value of the Marketization index distribution. The rankings are performed on an annual basis [16]. We then construct a dummy variable, *LMKTIDX*, and interact *LMKTIDX* with the political uncertainty measure and other variables. *LMKTIDX* is equal to one if the firm belongs to the weak institutional environment group, and zero otherwise.

The results are presented in Table 7. The estimates on the full sample are reported in column (1) and the estimates on the subsamples split by the institutional environment are reported in columns (2) and (3). As shown in column (1), the coefficient on $\Delta lnSALE_{n,i,t} \times D_{n,i,t} \times TURNOVER_{n,t} \times LMKTIDX_{n,t}$ is significantly negative at the 5% level (-0.013 with $t = -2.161$), suggesting that the impact of political uncertainty on cost stickiness is stronger in regions with a weak institutional environment. Interestingly, the coefficient on $\Delta lnSALE_{n,i,t} \times D_{n,i,t} \times LMKTIDX_{n,t}$ is also significantly negative at the 10% level (-0.021 with $t = -1.661$), implying that the degree of cost stickiness increases when a firm is located in a region with a weak institutional environment. This result is consistent with findings in Calleja *et al.* (2006) that weak corporate governance and institutions strengthen cost stickiness. In columns (2) and (3), we find that our main parameter of interest, β_8, is significantly negative in both regions with a weak institutional environment and regions with a strong institutional environment, indicating that political uncertainty increases the degree of cost stickiness after controlling for the local institutional environment. Moreover, the absolute value of β_8 is greater in the subsample of a weak institutional

Table 7.
Institutional environment: weak institutions vs strong institutions

	Full sample	By institutional environment	
		Weak institutions	Strong institutions
	(1)	(2)	(3)
$\Delta lnSALE_t$	0.992*** (70.173)	0.960*** (69.004)	1.009*** (71.171)
$\Delta lnSALE_t \times D_t$	−0.106*** (−4.288)	0.013 (0.337)	−0.198*** (−6.040)
$\Delta lnSALE_t \times TURNOVER_t$	−0.013** (−2.146)	0.002 (0.232)	−0.015** (−2.523)
$\Delta lnSALE_t \times D_t \times TURNOVER_t$	*−0.023*** (−2.068)	*−0.032*** (−2.115)	*−0.014*** (−2.016)
$\Delta lnSALE_t \times LMKTIDX_t$	−0.012** (−1.982)		
$\Delta lnSALE_t \times D_t \times LMKTIDX_t$	*−0.021** (−1.661)		
$\Delta lnSALE_t \times TURNOVER_t \times LMKTIDX_t$	0.014 (1.511)		
$\Delta lnSALE_t \times D_t \times TURNOVER_t \times LMKTIDX_t$	*−0.013*** (−2.161)		
Control	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes
Observations	20,392	9,098	11,294
Adjusted R^2	0.678	0.671	0.683

Note(s): This table presents the results of testing the impact of the institutional environment on the relation between political uncertainty and asymmetric behavior of operating costs. The subscript *t* denotes the time index, while prefecture-city and firm indices are omitted for brevity. The dependent variable is $\Delta lnXOPR$, the log-change in operating costs. Column (1) adds the key variable *LMKTIDX*. *LMKTIDX* is a dummy variable that takes the value of one if a firm is located in a region with a below-median Marketization index and zero otherwise. A low index value indicates a weak institutional environment. Columns (2) and (3) report the results on the subsamples of weak institutional environment and strong institutional environment. $\Delta lnSALE$ is the log-change in sales. *D* is a dummy variable that takes the value of one if sales decrease, and zero otherwise. *TURNOVER* is a dummy variable that takes the value of one if either the city head or mayor is changed in year *t*, and zero otherwise. All variables are defined in the Table A1. Regressions control for both firm and year fixed effects. Robust *t*-statistics reported in parentheses are based on standard errors clustered by firm. In this table, *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively

environment relative to that of a strong institutional environment, reinforcing the finding in the full sample. Altogether, the institutional environment should be taken into consideration when analyzing the relationship between political uncertainty and cost stickiness. More importantly, the weak institutional environment amplifies the effect of political uncertainty stemming from the prefecture-city official turnover on cost stickiness.

4.4.2 The effect of firms' ownership structure. Next, we examine H3 to test whether cross-sectional variation in firms' ownership structure affects the relationship between political uncertainty and cost stickiness. To conduct the analysis, we create a dummy variable, *SOE*, which equals one if a firm's ultimate controller is the state and zero otherwise (Guo *et al.*, 2021). We then interact *SOE* with the political uncertainty measure and add relative interaction terms into the baseline model. The results are shown in Table 8. Again, the estimates on the full sample are reported in column (1) and the estimates on the subsamples split by ownership are reported in columns (2) and (3). In Table 8, we consistently find that the coefficient on $\Delta lnSALE_{n,i,t} \times D_{n,i,t} \times TURNOVER_{n,t}$ is negative and statistically significant, which strengthens the baseline results. Moreover, as reported in column (1), the coefficient on $\Delta lnSALE_{n,i,t} \times D_{n,i,t} \times TURNOVER_{n,t} \times SOE_{n,i,t}$ is significantly positive at the 5% level (0.046 with $t = 2.275$), implying that state ownership weakens the effect of political uncertainty on cost stickiness. The results displayed in the subsamples (columns (2) and (3)), where the coefficient estimate for β_8 is more negative for POEs than SOEs, also confirm the finding. These results support H3 that ownership is an important driver behind the effect of political uncertainty on cost stickiness. Specifically, the impact of political uncertainty is stronger for POEs, suggesting that POEs are more sensitive to local official turnover than SOEs [17].

The above results also help directly address one alternative plausible explanation of our results. It is potentially possible that the incoming local government officials aim at maintaining stability and therefore encourage the listed firms to retain resources. We find

	Full sample	By ownership	
		SOEs	POEs
	(1)	(2)	(3)
$\Delta lnSALE_t$	0.984*** (70.628)	0.980*** (68.533)	0.992*** (62.695)
$\Delta lnSALE_t \times D_t$	−0.085*** (−3.473)	−0.067* (−1.876)	−0.117*** (−3.434)
$\Delta lnSALE_t \times TURNOVER_t$	−0.000 (−0.725)	−0.014** (−2.057)	−0.002 (−0.245)
$\Delta lnSALE_t \times D_t \times TURNOVER_t$	*−0.050*** (−3.555)	*−0.004*** (−2.272)	*−0.039*** (−2.718)
$\Delta lnSALE_t \times SOE_t$	0.009 (1.394)		
$\Delta lnSALE_t \times D_t \times SOE_t$	*−0.030*** (−2.208)		
$\Delta lnSALE_t \times TURNOVER_t \times SOE_t$	−0.015 (−1.615)		
$\Delta lnSALE_t \times D_t \times TURNOVER_t \times SOE_t$	*0.046*** (2.275)		
Control	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes
Observations	20,392	9,971	10,421
Adjusted R^2	0.728	0.688	0.683

Note(s): This table presents the results of testing the impact of firm ownership on the relation between political uncertainty and asymmetric behavior of operating costs. The subscript *t* denotes the time index, while prefecture-city and firm indices are omitted for brevity. The dependent variable is $\Delta lnXOPR$, the log-change in operating costs. Column (1) adds the key variable *SOE*. *SOE* is a dummy variable that takes the value of one for a state-owned enterprise and zero otherwise. Columns (2) and (3) report the results on the subsample of SOEs and the subsample of POEs, respectively. $\Delta lnSALE$ is the log-change in sales. *D* is a dummy variable that takes the value of one if sales decrease, and zero otherwise. *TURNOVER* is a dummy variable that takes the value of one if either the city head or mayor is changed in year *t*, and zero otherwise. All variables are defined in the Table A1. Regressions control for both firm and year fixed effects. Robust *t*-statistics reported in parentheses are based on standard errors clustered by firm. In this table, *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively

Table 8. Ownership structure: SOE vs POEs

such reasoning to be unconvincing because it fails to explain our finding that the impact of local official turnover is concentrated in POEs rather than in SOEs. SOEs in China are naturally connected to the government by ownership ties (Calomiris, Fisman, & Wang, 2010). As a result, it is less costly for the government to intervene in the corporate operations in SOEs (Gu *et al.*, 2020). For instance, Chen *et al.* (2021) document that the impact of local official turnover on tax avoidance concentrates in SOEs. Therefore, if the underlying mechanism driving our finding is the politician's goal of maintaining stability, we should observe a larger impact for SOEs instead.

4.4.3 The effect of firm size. To test H4, following Haveman *et al.* (2017), we classify a firm as small (denoted by *SMALL*) in year *t* if its total assets are below the sample median in year *t*, and zero otherwise. We then interact *SMALL* with the political uncertainty measure and add it into the baseline model. The estimation results are reported in Table 9. The coefficient on $\Delta lnSALE_{n,i,t} \times D_{n,i,t} \times TURNOVER_{n,t} \times SMALL_{n,i,t}$ in column (1) is significantly negative at the 1% level (−0.077 with $t = -3.846$), indicating that the relationship between political uncertainty and cost stickiness is significantly greater for small firms. In columns (2) and (3), we find that the estimated β_8 is only negative and statistically significant in the subsample of small firms, supporting the results based on the full sample.

5. Channel analysis

In this section, we shed light on the channels through which political uncertainty affects firms' asymmetric cost behavior. As discussed in the hypothesis development section, policy uncertainty and the threat of losing political connection are two potential channels through which local official turnover can influence cost stickiness. Our cross-sectional analyses on the local institutional environment, ownership type, and firm size provide evidence consistent with both channels. However, it is difficult to distinguish between these two channels. In this section, we aim at testing the validity of each mechanism conditional on the types of turnover and political connection, respectively.

	Full sample	By firm size	
		Small firms	Large firms
	(1)	(2)	(3)
$\Delta lnSALE_t$	0.980*** (75.908)	0.986*** (65.688)	0.971*** (68.301)
$\Delta lnSALE_t \times D_t$	−0.133*** (−5.258)	−0.120*** (−3.512)	−0.128*** (−3.656)
$\Delta lnSALE_t \times TURNOVER_t$	−0.014** (−2.184)	−0.001 (−0.080)	−0.013** (−2.113)
$\Delta lnSALE_t \times D_t \times TURNOVER_t$	*0.013* (0.892)	*−0.059*** (−3.987)	*0.010* (0.699)
$\Delta lnSALE_t \times SMALL_t$	0.009 (1.364)		
$\Delta lnSALE_t \times D_t \times SMALL_t$	*0.051*** (3.647)		
$\Delta lnSALE_t \times TURNOVER_t \times SMALL_t$	0.015* (1.643)		
$\Delta lnSALE_t \times D_t \times TURNOVER_t \times SMALL_t$	*−0.077*** (−3.846)		
Control	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes
Observations	20,392	10,202	10,190
Adjusted R^2	0.677	0.671	0.684

Note(s): This table presents the results of testing the impact of firm size on the relation between political uncertainty and asymmetric behavior of operating costs. The subscript *t* denotes the time index, while prefecture-city and firm indices are omitted for brevity. The dependent variable is $\Delta lnXOPR$, the log-change in operating costs. Column (1) adds the key variable *SMALL*. *SMALL* is a dummy variable that takes the value of one for a small firm and zero otherwise. A firm is defined as small in year *t* if the total assets are below the median of all the firms in year *t*, and vice versa. Columns 2 and 3 report the results on the subsamples of small firms and large firms, respectively. $\Delta lnSALE$ is the log-change in sales. *D* is a dummy variable that takes the value of one if sales decrease, and zero otherwise. *TURNOVER* is a dummy variable that takes the value of one if either the city head or mayor is changed in year *t*, and zero otherwise. All variables are defined in the Table A1. Regressions control for both firm and year fixed effects. Robust *t*-statistics reported in parentheses are based on standard errors clustered by firm. In this table, *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively

Table 9.
Firm size: small firms vs large firms

5.1 Channel one: economic policy uncertainty

We first test the economic policy uncertainty channel conditional on the turnover type. In the Chinese political system, local officials have significant autonomy in their regions and have authority in determining local economic policies (Xu, 2011; Chen *et al.*, 2018; Bai *et al.*, 2020). Therefore, the turnover of local officials generates significant economic policy uncertainty. The degree of this uncertainty for local firms is arguably dependent on the type of turnover [18] Specifically, we adopt two alternative methods to measure the degree of economic policy uncertainty driven by official turnover. First, we follow An *et al.* (2016) and distinguish local official turnover into two types: local promotion and external appointment. Local promotion, the replacement of a local government official with an official within the same city, creates minimal policy uncertainty. Conversely, external appointments, in which an official from another city replaces the local government official generally result in a more dramatic change in local economic policies (An *et al.*, 2016). The alternative method is to explore whether the official turnover is expected or unexpected (Ru, 2018). The nominal term of government officials in China is normally five years. Nevertheless, some officials may leave their positions earlier than expected because of unforeseen events such as corruption charges, promotion or death [19]. As such, when turnover is unexpected, local firms face a higher degree of policy uncertainty because they do not have enough information or time to strategize their operational decisions.

Based on the above reasoning, if economic policy uncertainty is the underlying channel, we expect that the effect of political uncertainty on cost stickiness will be more pronounced if the new official belongs to the external appointment and turnover is unexpected. To test these two predictions, we construct two dummy variables, denoted as *EXTERNAL* and *UNEXPECTED*, and add their interaction terms into the baseline model. *EXTERNAL* is equal to one if any of the two leaders in the city is replaced by an external appointment and zero otherwise. *UNEXPECTED* is equal to one if any of the two leaders in the city severs the position for less than five years and zero otherwise. Table 10 shows that the coefficients on $\Delta lnSALE_{n,i,t} \times D_{n,i,t} \times TURNOVER_{n,t} \times EXTERNAL_{n,t}$ and $\Delta lnSALE_{n,i,t} \times D_{n,i,t} \times TURNOVER_{n,t} \times UNEXPECTED_{n,t}$ are negative and significant at the 1% level, which suggests that the degree of cost stickiness increases more when changes in prefecture-city officials are external and when turnover is unexpected. These results show that the effect of political uncertainty on cost stickiness is greater for external appointments and unexpected turnovers, which generally represent a high degree of policy uncertainty. Therefore, our analysis conditional on the turnover type provides supporting evidence on the economic policy uncertainty channel.

5.2 Channel two: political connections

To explore whether the negative impact of local official turnover is associated with a change in political connections, we follow Zhang *et al.* (2016) and identify two types of political connections for private firms [20]. The first type is ascribed political connections that represent the political background the individual executive obtained before entering the business. The other is achieved political connections that result from political appointments to state organs (such as congresses and political councils) after executives became successful business leaders. We expect that firms with executives who have ascribed bureaucratic connections are less likely to be affected by the political uncertainty arising from changes in local government officials compared to firms whose executives do not have such connections. As argued by Zhang *et al.* (2016), ascribed bureaucratic connections often indicate deep political embeddedness. Previous government working experience endows the executives with unique information about government bureaucracy and operation and allows them immediately building up a relationship with new officials by using their common language.

	(1)	(2)
$\Delta lnSALE_t$	0.986*** (73.158)	0.987*** (73.495)
$\Delta lnSALE_t \times D_t$	−0.101*** (−4.196)	−0.103*** (−4.310)
$\Delta lnSALE_t \times TURNOVER_t$	−0.016* (−1.631)	−0.010 (−1.309)
$\Delta lnSALE_t \times D_t \times TURNOVER_t$	*−0.016*** (−3.304)	*−0.034*** (−1.982)
$\Delta lnSALE_t \times TURNOVER_t \times EXTERNAL_t$	0.011 (1.030)	
$\Delta lnSALE_t \times D_t \times TURNOVER_t \times EXTERNAL_t$	*−0.025*** (−3.163)	
$\Delta lnSALE_t \times TURNOVER_t \times UNEXPECTED_t$		0.004 (1.505)
$\Delta lnSALE_t \times D_t \times TURNOVER_t \times UNEXPECTED_t$		*−0.021*** *(−3.023)*
Control	Yes	Yes
Year fixed effect	Yes	Yes
Firm fixed effect	Yes	Yes
Observations	20,392	20,392
Adjusted R^2	0.754	0.777

Note(s): This table presents the results of comparing the effect of the change of government officials according to different types of turnover. Column (1) reports the estimation by distinguishing official turnover into the external appointment and local promotion. Column (2) reports the estimation by distinguishing official turnover into expected and unexpected. The subscript t denotes the time index, while prefecture-city and firm indices are omitted for brevity. The dependent variable is $\Delta lnXOPR$, the log-change in operating costs. $\Delta lnSALE$ is the log-change in sales. D is a dummy variable that takes the value of one if sales decrease, and zero otherwise. *EXTERNAL* is a dummy variable that takes the value of one if an official is appointed from another city by a higher level of government, and zero otherwise. *UNEXPECTED* is a dummy variable that takes the value of one if an official severs the position for less than five years, and zero otherwise. All variables are defined in the Table A1. Regressions control for both firm and year fixed effects. Robust t-statistics reported in parentheses are based on standard errors clustered by firm. In this table, *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively

Table 10.
Channel test one: turnover types

On the other hand, firms with executives who have achieved political connections are more likely to be affected by political uncertainty compared to firms whose executives do not have such connections. Achieved political connections are largely a result of ongoing cooperation and favor exchange between business and the existing local government (Zhang *et al.*, 2016). When the turnover occurs, a firm's political connections established in the previous political regime may disappear and their ongoing projects could be in danger of being discontinued (Jiang *et al.*, 2021). As such, firms with achieved political connections are more sensitive to the changes in local government officials compared with firms that do not rely on government support. To test this prediction, we collect the detailed personal background of all the board members from the CSMAR database and annual reports and then identify the specific type of political connection if any. Firms with at least one board member with a certain type of political connection are classified into that type. Our sample period for this analysis is from 2008 to 2017.

Table 11 presents the estimation results. The estimates on the subsamples split by ascribed bureaucratic connections are reported in Panel A and the estimates on the subsamples split by achieved political connections are reported in Panel B. As shown in column (1) of Panel A, the coefficient on $\Delta lnSALE_{n,i,t} \times D_{n,i,t} \times TURNOVER_{n,t}$ is insignificant (0.169 with $t = 1.243$), suggesting that firms whose executives have achieved political connections are not affected by political uncertainty due to political turnover. Moreover, As shown in column (1) of Panel B, we find that the coefficient on $\Delta lnSALE_{n,i,t} \times D_{n,i,t} \times TURNOVER_{n,t}$ is negative and significant at the 1% level (−0.113 with $t = -2.843$), indicating that firms led by executives who have achieved political connections are more sensitive to local government official turnover. Our empirical results are consistent with the political connection channel hypothesis, that is political uncertainty is a

Panel A: Ascribed political connections	Ascribed political connection (1)	No-ascribed political Connection (2)
$\Delta lnSALE_t$	0.826*** (6.507)	0.984*** (46.941)
$\Delta lnSALE_t \times D_t$	−0.878** (−2.153)	0.055 (1.136)
$\Delta lnSALE_t \times TURNOVER_t$	0.031 (0.659)	−0.005 (−0.640)
$\Delta lnSALE_t \times D_t \times TURNOVER_t$	0.169 (1.243)	−0.042** (−2.322)
Control	Yes	Yes
Year fixed effect	Yes	Yes
Firm fixed effect	Yes	Yes
Observations	255	8,227
Adjusted R^2	0.701	0.683
Panel B: Achieved political connections	Achieved political connections (1)	Non-achieved political connections (2)
$\Delta lnSALE_t$	0.927*** (21.176)	0.991*** (41.949)
$\Delta lnSALE_t \times D_t$	0.401*** (3.438)	0.010 (0.180)
$\Delta lnSALE_t \times TURNOVER_t$	0.018 (1.160)	−0.009 (−1.082)
$\Delta lnSALE_t \times D_t \times TURNOVER_t$	−0.113*** (−2.843)	−0.036* (−1.772)
Control	Yes	Yes
Year fixed effect	Yes	Yes
Firm fixed effect	Yes	Yes
Observations	1,675	6,807
Adjusted R^2	0.694	0.683

Note(s): This table presents the results of testing the impact of political connections on the relation between political uncertainty and asymmetric behavior of operating costs. We distinguish political connections into two types: ascribed bureaucratic connections (Panel A) and achieved political connections (Panel B). The subscript t denotes the time index, while prefecture-city and firm indices are omitted for brevity. The dependent variable is $\Delta lnXOPR$, the log-change in operating costs. $\Delta lnSALE$ is the log-change in sales. D is a dummy variable that takes the value of one if sales decrease, and zero otherwise. $TURNOVER$ is a dummy variable that takes the value of one if either the city head or mayor is changed in year t, and zero otherwise. All variables are defined in the Table A1. Regressions control for both firm and year fixed effects. Robust t-statistics reported in parentheses are based on standard errors clustered by firm. In this table, *, **, and *** denote statistical significance at the 10, 5, and 1% levels, respectively

Table 11. Channel test two: political connection

shock that has a significant impact on a firm's existing political connection and subsequently affects its operating decisions.

Overall, we provide some evidence showing that both economic policy uncertainty and political connection are likely to be two underlying channels that jointly shape the influence of local political uncertainty. As it is challenging to generate definitive proof of the underlying channels, the results should be interpreted with caution.

6. Conclusion

Using hand-collected data on prefecture-city official turnover for 260 cities in China, we examine the effect of political uncertainty on operational decisions evident in cost stickiness. This analysis contributes to the literature on the economic implications of political uncertainty by testing the relation between political uncertainty and cost stickiness at the local government level.

According to the baseline results, we document that cost stickiness is greater in turnover years than in non-turnover years, suggesting that managers retain slack resources when

political uncertainty is high. Our results are robust to the instrumental variable analysis, placebo tests, matched sample approach, alternative specifications of local official turnover, and using other cost categories as well as controlling the anti-corruption campaign and national election effect. Moreover, we conduct a set of cross-sectional analyses and show that the relation between political uncertainty and cost stickiness is more pronounced for firms located in regions with a weak institutional environment, firms that are privately owned, and firms with a smaller size. Our channel analyses provide consistent evidence that local political turnover affects firms' sticky cost behavior through both the policy uncertainty and the threat of losing political connection mechanisms. Overall, these findings imply that political uncertainty stemming from prefecture-city official turnover is an important channel through which local political process influences firms' cost behavior, and firms do take political uncertainty into account when setting their resources adjustment policies.

Notes

1. See Banker and Byzalov (2014) and Banker, Byzalov, Fang, and Liang (2018) for a comprehensive review. Section 2 of this paper also provides a brief literature review on the determinants of cost stickiness.
2. Xu (2011) describes China as "regionally decentralized authoritarianism."
3. Local political leaders may also differ in their abilities to promote local economic growth (Yao & Zhang, 2015).
4. For instance, Hou and Li (2020) show that new provincial governors distribute significantly fewer subsidies to private enterprises after taking their offices. Fang *et al.* (2018) find that compared to SOEs, private firms seek to use more perks to rebuild the political connections during local political turnovers.
5. Our data are mainly collected from the following websites: the Party and Government Leaders Database provided by the News of the Communist Party of China (http://cpc.people.com.cn/), Baidu Wikipedia (http://baike.baidu.com) and Zecheng Web (http://www.hotelaah.com). If the personal information provided by these websites is inconsistent, we then search for public news on the appointment of city heads and mayors through http://www.baidu.com/ to make revisions.
6. In the CSMAR database, the earliest year with data available is 1990. However, beginning the sample period in 1990 would result in a highly unbalanced sample because there are only a few observations at the beginning of the sample, which may undermine the reliability of test results. Moreover, the disclosure of cash flows has been mandatory in China since 1998.
7. Variables in the study (e.g. sales growth) require data lagged for 2 years, as a result, our sample period begins in 2000.
8. Although the log-linear specification of asymmetric cost behavior model is the most used model in the extant literature (e.g. Banker *et al.*, 2013; Cheng, Jiang, & Zeng, 2018; Lee *et al.*, 2020), Balakrishnan, Labro, and Soderstrom (2014) note that this does not explicitly control for a firm's cost structure. The estimated coefficients are influenced by the magnitude of fixed or non-controllable costs in the function, leading to a non-constant elasticity in the response. Considering the possible bias toward finding cost asymmetry due to fixed or non-controllable costs, we also adopt Balakrishnan *et al.*'s (2014) model and estimate the linear specification of the baseline model. In untabulated results, we find our conclusions are robust to this alternative specification. Our findings are also consistent with Cheng *et al.* (2018) that Chinese firms exhibit sticky cost behavior with Balakrishnan *et al.* (2014)'s specification. In addition, Dierynck, Landsman, and Renders (2012) argue that including independent variables, such as asset intensity, employee intensity and GDP growth, can effectively control for fixed costs and economic conditions. Because we include sufficient control variables in the baseline model, to a great extent our log-linear model mitigates the effect of fixed or non-controllable costs.
9. In our sample period, the median (mean) tenure of city head is 3.92 (4.17) years, while the median (mean) of city major is 4 (4.23) years.

10. There is a concern that these two variables might be related with local economic conditions and therefore can affect local firms' operational decisions. According to the tests in Ni (2019), there is no significant association between these two IVs and the local economic conditions. It largely attenuates this concern. Furthermore, we have controlled for local economic conditions in our analysis, which further mitigates the concern of violating the exclusion condition.
11. In untabulated results, we test the relation between IVs (*AGE* and *TURNOVER_PEER*) and *TURNOVER* (*TURNOVER_HEAD* and *TURNOVER_MAYOR*). In line with the prior studies (e.g. An *et al.*, 2016; Xu *et al.*, 2016; Ni, 2019), we show that *AGE* (*TURNOVER_PEER*) is negatively (positively) associated with the probability of turnover.
12. The anti-corruption campaign was initiated shortly after the conclusion of the 18th National Congress of the Communist Party of China on November 14th, 2012. We, therefore, use 2012 as the cut-off year to define pre- and post-anti-corruption campaign.
13. We thank an anonymous reviewer for this suggestion.
14. In an unreported analysis, we find that these two groups have similar asymmetric cost behaviors in the absent of political turnover, further confirming the causal impact of political turnover on cost stickiness.
15. The five fields of the marketization index are: (1) relation between government and market; (2) the market development of the non-state enterprise sectors; (3) product marketization; (4) factor market development; (5) the development of market intermediaries and the legal framework. This index has been widely used across economics, finance and business (e.g. Feng, Johansson, & Zhang, 2014; Zhang *et al.*, 2015; Feng & Johansson, 2017; Jia, Huang, & Zhang, 2019; Zhang *et al.*, 2015).
16. The median value is set according to the distribution of the actual NERI Marketization index of the regions that the firms are located in and thus generates an unequal number of observations being assigned to each of the groups. This approach is to ensure that we do not assign firms located in regions with a low Marketization index to the strong institutional environment group and that firms located in regions with same index are always assigned to the same group.
17. To address the concern that some SOEs located in the capital city of provinces might be subject to the ruling of province-level government officials rather than city-level government officials, we remove SOEs located in the capital cities and re-estimate the regressions. The results are similar to the main results in Table 8. We thank an anonymous reviewer for this suggestion.
18. We thank an anonymous reviewer for the suggestion on testing this channel.
19. In our sample, 68.8% (68.4%) of city heads (mayors) sever their position for less than five years.
20. We focus on private firms because all the SOEs are politically connected by nature. Our prior finding that the impact of political turnover is less pronounced in SOEs is also consistent with the implication of the political connection mechanism, though we cannot rule out the economic policy uncertainty mechanism.

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Appendix

Variable	Definition
City-level variables	
TURNOVER	A dummy variable that takes a value of one if there is a change of CCP head or mayor in year t for a city, and zero otherwise. If an official change occurs in the first (second) half of year t, the turnover is considered as occurring in year t (year $t + 1$)
TURNOVER_HEAD	A dummy variable that takes a value of one if there is a change of CCP head in year t for a city, and zero otherwise. If an official change occurs in the first (second) half of year t, the turnover is considered as occurring in year t (year $t + 1$)
TURNOVER_MAYOR	A dummy variable that takes a value of one if there is a change of mayor in year t for a city, and zero otherwise. If an official change occurs in the first (second) half of year t, the turnover is considered as occurring in year t (year $t + 1$)
TURNOVER_BOTH	A dummy variable that takes a value of one if there is a change of CCP head and mayor in year t for a city, and zero otherwise. If an official change occurs in the first (second) half of year t, the turnover is considered as occurring in year t (year $t + 1$)
AGE	Natural log of prefecture-city officials' age prior to the turnover year
TURNOVER_PEER	Mean value of prefecture-city official turnover of other cities in the same province in year t
GDP	A city's real GDP growth rate
UNEMP	A city's unemployment rate
EXTERNAL	A dummy variable that takes a value of one for the head or mayor is replaced with an external appointment and zero otherwise
UNEXPECTED	A dummy variable that takes a value of one for the head or mayor severs the position for less than five years and zero otherwise
LMKTIDEX	A dummy variable that takes a value of one if a firm is located in a region with a below-median marketization index, and zero otherwise. The marketization index measures the levels of institution development, with a lower value indicating a weak institutional environment
Firm-level variables	
$\Delta lnXOPR$	The change in the natural logarithm of operating costs, calculated by costs of goods sold plus other operating expenses (i.e. selling, general, administrative costs, and research and development expenses)
$\Delta lnSG\&A$	The change in the natural logarithm of selling, general and administrative costs
$\Delta lnR\&D$	The change in the natural logarithm of research and development expenses
$\Delta lnCOGS$	The change in the natural logarithm of cost of goods sold
$\Delta lnSALE$	The change in the natural logarithm of sales
lnAINT	The natural logarithm of total assets to sales
lnEMPINT	The natural logarithm of the number of employees to sales
D	A dummy variable that takes a value of one if sales decreased in year t, and zero otherwise
LAGD	A dummy variable that takes a value of one if sales decreased in year $t - 1$, and zero otherwise
SOE	A dummy variable that takes a value of one for a state-owned enterprise, and zero otherwise
SMALL	A dummy variable that takes a value of one for a firm with total assets below the sample median in year t, and zero otherwise

Table A1.
Variable definitions