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Abstract

This paper investigates the impact of the minimum wage (MW) on corporate tax planning. By exploiting heterogeneity in the MW level across cities and over time in China, we find that increases in the MW are associated with greater tax planning by firms. Our results are robust to the consideration of a sample of contiguous firms in two adjacent cities subject to different MWs, a change specification and a difference-in-differences research design that exploits the enactment of the Labor Contract Law in 2008 as an exogenous shock to the MW. In cross-sectional analyses, we find that the positive impact of MWs on tax planning is more pronounced for firms with higher labor intensity, greater financial constraints, less product market power, and in regions with laxer enforcement. Our paper suggests that public policy decisions such as MWs impose significant, albeit likely unintended, externalities on corporate decisions.

Keywords: Minimum Wage; Tax Avoidance; Labor Cost

JEL classifications: E24; H25; J48

1. Introduction

The question of how employment protection shapes corporate policy has recently attracted substantial research interest (e.g., Lin, Schmid and Xuan 2016; Bradley, Kim and Tian 2016). Studies on the topic suggest that employment protection captured by unemployment insurance, labor unions or related labor law exerts a direct and significant impact on firms' accounting policies, real activities and performance (Dou, Khan and Zou 2016; Agrawal and Matsa 2013; Simintzi, Vig and Volpin 2014; Bai, Fairhurst and Serfling 2019). Although the minimum wage (MW) is a core element of employment protection and labor policy, it has received considerably less attention in accounting research. [1] Relative to the other abovementioned policies, it is less clear whether and how firms react to increased MWs by altering corporate strategies.

In this paper, we focus on the firm-level impact of MWs on corporate tax planning, which raises important issues for both government and regulators.[2] We are motivated to examine this issue for the following reasons. First, MW policy is a global policy to protect low-income employees, which may influence corporate decision making since MW hikes represent a generally exogenous elevation of labor costs and operating leverage (Geng, Huang, Lin and Liu 2017). Labor costs are a major component of firms' cost structures, especially in most developing countries where the demographic dividend is one of the major forces that promote economic growth. Several recent studies find that MW hikes drive up labor costs, thereby increasing operating costs and resulting in a significant impact on financial leverage

[1] As a controversial issue in the political area, MW policy has received much attention in the economics literature. The heated study on MW mainly focus on whether it eliminates poverty, reduces inequality, depresses firm employment incentives, etc. See Card and Krueger (2015) for a review.

[2] Prior literature uses the terms "tax planning" and "tax avoidance" to denote a variety of actions taken by managers to reduce tax burden of their firm, including both legal tax strategies that are fully compliant with tax laws and more aggressive tax strategies such as making use of ambiguous areas within the tax laws or even illegal tax evasion. In this paper, we view these terms interchangeably.

and corporate investment (Geng et al. 2017, 2018; Gustafson and Kotter 2018). However, how MW policy affects corporate operating strategies, such as tax planning, is less clear. It is interesting and important to study how corporations react to MW policies because doing so can help regulators evaluate the consequences of public policies, whether intended or unintended. Second, tax planning may be a viable alternative strategy for companies to cushion the impact of labor cost shocks since it is less likely to adversely impact the firm's operations than other cost-cutting methods, such as firing short-tenured but potentially highly productive workers (Edwards, Schwab, and Shevlin 2016; Caggese, Cuñat, and Metzger 2018). Moreover, tax revenue is a major source of fiscal revenues for governments in most countries. The interplay between MW policy and tax revenue should be an important factor for policy makers to consider.

From a theoretical perspective, the effect of MWs on corporate tax planning is ambiguous. On the one hand, we predict that MW hikes will cause firms to engage in greater tax planning due to negative shocks to operating costs, financial reporting performance and cash flow. Moreover, MW hikes make firms' labor costs more fixed, reduce labor flexibility, and increase firms' operating risks because their operating profits are more sensitive to economic shocks (Donangelo, Gourio, Kehrig, and Palacios 2019). Existing empirical findings suggest a negative impact of MWs on firms' financial health (Chava, Oettl, and Singh 2018), and survey results also show that MW materially affects firms' labor costs.[3] To reduce such operating risk, firms have strong incentives to save more cash, increase internally generated funds to invest more in fixed assets and adopt new technologies to offset growing labor costs caused

[3] A survey of 1,037 U.K. employers conducted by the Chartered Institute of Personnel and Development (CIPD) and Resolution Foundation in 2015 finds that over half of employers (54%) reported that MW hikes would affect their wage bill, with 18% of those employers claiming they would be affected to a large extent. See the survey report at https://www.cipd.co.uk/Images/weighing-up-the-wage-floor_2016-employer-responses-National-living-wage_tcm18-10963.pdf.

by the higher wage floor in the long term[4], which in turn increases short-run financing needs (Geng et al. 2017). Thus, we expect that MW hikes provide firms with *cash saving incentives* to generate more, but less costly, internal funding through tax planning activities (Law and Mills 2015; Edwards et al. 2016).

On the other hand, MW hikes may not affect corporate tax planning for several reasons. First, from a tax standpoint, labor costs are fully tax deductible (De Vito 2018). Increased labor costs caused by MW hikes also increase tax deductions, which reduce the marginal benefits of tax planning. Second, as argued by Edwards et al. (2016), "many tax planning strategies require an upfront investment without an immediate benefit." Hence, financially constrained firms may not be able to immediately implement such tax strategies, and we should find no association between MW hikes and tax planning. Third, being associated with excessive tax planning could subject firms and managers to litigation/reputational costs because tax planning strategies can be risky activities and could be challenged by tax authorities (Rego and Wilson 2012). The media have recently covered numerous cases of corporate tax planning by firms around the world, portraying the practice as highly controversial. Therefore, whether the MW affects corporate tax planning is ultimately an empirical question.

Despite the importance of MW policies, few studies have examined the effect at the firm level, in part due to the severe empirical challenges in estimating the treatment effects of MWs. The MW data used in previous studies present limited cross-sectional variation because, in most countries, MW policies vary at the level of broad geographical areas such as a country or state.[5] We tackle this issue by

[4] For example, anecdotal evidence suggests that McDonald's, in response to the "Fight for $15" MW campaign, is rolling out a new scheme to replace full-service employees with self-service alternatives.

[5] Globally, the MW is usually the same within a country (e.g., in the UK, Germany, Australia) or within a state/province (e.g., in the United States and Canada). A lack of variation within a country may induce endogeneity

exploiting the large geographical and inter-temporal variations in MW policies in China, where MW policies vary across more than 239 cities. During our sample period (2005-2017), China implemented more than 1,300 local MW changes, more than half of which were greater than 10%, which provides a powerful setting to explore our research question. In addition to the wide variations in MWs across cities, there are three additional reasons that the Chinese setting provides a perfect opportunity to investigate our research question. First, the timing of MW hikes is largely determined by different local governments, which can be considered relatively exogenous for the purposes of this study.[6] Second, unlike developed countries, where employment protection increases the collective bargaining power of employees through unions (Chyz, Leung, Li and Rui 2013; Devos and Rahman 2018; Gustafson and Kotter 2018), MW policy in China is unlikely to be driven by labor unionization because trade unions in China are rather weak and do not function well (Cui, John, Pang and Wu 2018). Consequently, China is a relatively clean setting to test firms' reactions to shocks caused by MW hikes due to a lack of collective bargaining mechanisms in employment protection.[7] Finally, similar to most developing countries, the demographic dividend is critical to China's economic growth. MW hikes will have a substantial impact on the labor costs, performance and cash flows of listed

concerns, i.e., economic fundamentals and public policies at the country/state level may simultaneously be correlated with both MW hikes and corporate decisions (Allegretto, Dube, Reich, and Zipperer 2017).

[6] Geng et al. (2017) explore the determinants of MW hikes and find very little evidence that economic conditions such as local GDP growth, the level of GDP per capita, or foreign investment growth predict MW hikes.

[7] Prior U.S. studies provide mixed evidence on the association between employment protection and tax planning. For example, Chyz et al. (2013) find a negative association between union power and firms' tax aggressiveness. They argue that labor unions constrain managers' ability to invest in tax aggressiveness through increased monitoring. In contrast, Devos and Rahman (2018) report a positive relation between tax aggressiveness and unemployment insurance benefits. In China, MW hikes increase employment protection, which creates additional operating cost burdens for firms, but do not provide collective bargaining power for unions to monitor firms ' risky activities such as tax planning. Therefore, China is a relatively clean setting to test the effects of MW hikes on tax planning through cash saving incentives.

companies (Li, Wu, and Xiong 2012; Ge and Yang 2014), which further increases the power of the test to detect the relation between MWs and corporate tax planning.[8]

To test for the effect of MW hikes on corporate tax planning activities, we hand-collect MW data at the city level and match it with the headquarter location of listed firms during the period 2005-2017.[9] Our empirical specifications control for firm- and city-level characteristics known to affect tax planning. We also control for several dimensions of fixed effects, i.e., firm, industry-year and province-year fixed effects, to exclude time-invariant characteristics and unobserved heterogeneity that varies with industry and province over time. We find that increases in the MW cause firms to engage in more tax planning to generate more precautionary cash. A 10% increase in the MW corresponds to a 1.06 percentage-point decrease in *Cash ETR* in the subsequent year, amounting to 5.22 percent of the sample average. The economic magnitude of this estimate is non-trivial considering that the average growth rate of the MW is 11.8% per year during the sample period. These results continue to hold when we use long-term *Cash ETR* as an alternative proxy for tax planning.

The key identification assumption to infer causality in our setting is that the estimated treatment effect of the MW on tax planning is not tainted by local business cycles or other omitted variables.[10] To overcome the endogeneity problem, we perform a variety of robustness tests. First, we exploit large geographic variations in

[8] During our sample period, the mean cash paid to employees (excluding the cash paid to top executives) is 66.8 percent of total cash outflow for the listed companies. As suggested by Geng et al. (2018), private firms, especially small and medium businesses, are more exposed to MW shocks because they tend to be less technologically intensive and rely more on labor. Because of a lack of data on private firms, we can only use listed companies to investigate the effects of MW policy on corporate tax planning. If we do detect a relation, it is likely to be underestimated.

[9] In China, there are four municipalities directly under the control of the central government (i.e., Beijing, Shanghai, Chongqing and Tianjin) that can be administratively viewed as provinces. For the firms located in these four municipalities, we use prefecture-level data to match the listed firms and MWs.

[10] A potential source of reverse causality is that local government adjusts the MW downward to help local firms reduce labor costs, leading to less need for such firms to engage in tax planning, and therefore we observe a positive association between the MW and corporate tax planning. There are two counterarguments. First, it is not possible for Chinese firms to influence their local officials against decisions about MWs or any other public policy. Second, the average growth rate of MWs over our sample period is 11.4% per year with very rare downward MW adjustments (only 2 percent of sample observations). Hence, reverse causality does not pose a real threat in our study.

China's MW policies and construct contiguous city-pairs that contain firms located in nearby cities. Specifically, for each city, we identify its closest city in the *same* province by geographical distance because nearby cities were subject to the same shocks that may be spuriously correlated with MW increases[11]. Our results still hold in the city-pair matched sample.[12] Second, we use a change model to address endogeneity, and our main results continue to hold. Third, we exploit the enactment of the Labor Contract Law (LCL) in 2008 in China as an exogenous shock to MW enforcement and implement difference-in-difference analysis. The LCL enhances employee protection and increases the MW (Ni and Zhu 2018). We find that the increase in tax planning is greater for firms with high labor intensity (treatment firms) than for firms with low labor intensity (control firms) after the enactment of the law. Moreover, we find that the negative impact of the LCL is more pronounced for firms located in cities with larger MW hikes. These results corroborate our main findings.

We next strengthen our main findings by exploring heterogeneous effects of MW hikes on tax planning. Firms trade off the marginal benefits and costs of tax planning when responding to the negative shocks caused by MW hikes. We expect the impacts of MW hikes to be more (less) pronounced when the marginal benefits (costs) are larger. Consistent with our prediction, we find that the effects of MW hikes on corporate tax planning are more pronounced for more labor-intensive firms and financially constrained firms, and less pronounced for firms with more product market power and those located in regions with stronger tax enforcement. Taken together, our

[11] As documented in Geng et al. (2017), firms in geographically proximate areas demonstrate a sufficiently high level of similarity in credit and labor supply, proximity to public infrastructure (e.g., airport, railway, and seaport or inland port), market access, natural resource endowments, and some unobservable factors such as local cultural characteristics.

[12] As Dube, Lester, and Reich (2010) note, a key advantage of the city-pair approach is that for each treated city, a neighboring city can be directly assigned as a control that shares a high degree of similarity with the treated city, whereas in the traditional fixed effects approach, any randomly chosen city is assumed to be as good a control as any other.

results indicate that MW hikes affect corporate tax planning and that firms weigh carefully the benefits and costs in their decisions to save more taxes.

To better understand how firms save taxes when they are negatively affected by MW hikes, we examine one specific type of tax planning strategy in China: the shifting of income between member firms in a business group (Lin, Mills, Zhang and Li 2018). In China, firms are required to file taxes based on separate legal entities, which creates strong incentives for them to shift income within the group. We follow Lin et al. (2018) and measure the opportunity for such shifting as "a joint function of the spread in tax rates among members of the consolidated group and the magnitude of intragroup transactions." Our findings reveal that MW hikes lead to more tax planning associated with income-shifting opportunities, suggesting that MWs cause firms to avoid more taxes through income shifting.

We note two concurrent working papers that also examine the effect of labor market frictions in the U.S. on tax planning. Nguyen (2018) shows that higher labor adjustment costs, measured by the extent of a firm's reliance on skilled labor, cause U.S. firms to avoid more taxes. Devos and Rahman (2018) find that firms located in states with low unemployment insurance benefits (higher unemployment risk) engage in less tax planning. However, how labor market frictions affect tax planning is unclear given the findings in these two studies. The finding in Nguyen (2018) suggests that an increase in labor market frictions associated with greater labor adjustment costs induces firms to avoid *more* taxes, while the finding in Devos and Rahman (2018) suggests that an increase in labor market frictions associated with greater unemployment risk induces firms to avoid fewer taxes.

Hence, we view our study as complementary to Nguyen (2018) and Devos and Rahman (2018) by examining a different source of labor market friction – the impact

of MWs on tax planning. More importantly, our finding that MWs lead to greater tax planning cannot be inferred from the current literature due to its mixed results. In addition, the findings in developed countries such as the U.S. may not be generalizable to developing countries such as China due to significant differences in institutional environments and enforcement (Haepp and Lin 2017; Soares 2018).

Our study extends the literature in the following important ways. First, this study contributes to the growing literature examining the real effect of MWs on corporate decision making, a phenomenon that is attracting greater interest as human capital becomes an increasingly critical asset for firms (Zingales 2000). The longstanding discussions about the MW focus on whether such provisions eliminate poverty, reduce inequality, or depress firm employment incentives (e.g., Ippolito 1988; Acemoglu and Angrist 2001; Botero, Djankov, La Porta, Lopez-De-Silanes, and Shleifer 2004; Neumark, Cunningham, and Siga 2006). Recent research has begun to investigate how MWs affect corporate financing and investment decisions (Geng et al. 2017, 2018; Gustafson and Kotter 2018). However, the change in investing, financing or reporting behaviors cannot directly reduce the negative shocks arising from MWs. We provide new empirical evidence that firms can mitigate the negative effect of MW hikes through tax planning, which is an important source of internal financing (Edwards et al. 2016; Nguyen 2018).

Second, we contribute to the growing literature on the determinants of corporate tax planning. Prior literature documents the effects of firm- and manager-specific characteristics on corporate tax planning (Rego 2003; Chen, Chen, Cheng, and Shevlin 2010; Hanlon and Heitzman 2010; McGuire, Omer, and Wang 2012; Armstrong, Blouin, Jagolinzer, and Larcker 2015). Rather than focusing solely on firm-specific characteristics, we examine the impact of labor regulations on tax

planning. Because taxes are a key source of income in running an economy, it is crucial to comprehend the interplay between MW policy and corporate tax planning activities. To the extent that firms undertake greater tax planning in response to MW regulations, they potentially transfer the protection cost to the government in the form of reduced tax revenues.

The remainder of this paper proceeds as follows: Section 2 provides institutional background and develops the research hypotheses. Section 3 discusses sample selection and research design, and Section 4 discusses the empirical results and robustness checks. Section 5 concludes the paper.

2. Institutional Background and Hypothesis Development

2.1. Institutional Background

2.1.1 Minimum Wage Policy in China

In China, MW regulations were first approved in 1993. They hold the local administrative department of labor and social security accountable for the enforcement of MW policy. On March 1, 2004, the Ministry of Human Resources and Social Security (MOHRSS) issued a revised version of the MW regulations. It expanded the coverage, substantially raised the level of MWs, and increased fines on noncomplying firms.[13]

Article 7 of the contemporaneous labor law authorizes provincial governments to set the local MW, which can vary across cities within a given province. Lower-level authorities, such as city-level governments, can negotiate local MWs with their respective provincial authorities and therefore have substantial influence over MW policy in their respective administrative areas (Casale and Zhu 2013). Provincial authorities are responsible for reviewing these policies and monitoring policy

[13] See Huang et al. (2014) for further details on China's MW policy. See also the official documentation on the MW regulation in http://www.mohrss.gov.cn/SYrlzyhshbzb/zcfg/flfg/gz/201705/t20170522_271193 .html (in Chinese).

enforcement. The timing of MW changes is largely determined by internal party politics, which can thus be considered relatively exogenous (Huang, Loungani and Wang 2014). There are also substantial variations across different provinces in the frequency of MW adjustments, which provides an excellent setting to study the impact of MWs on tax planning.

2.1.2 Corporate taxation in China

In China, most firms were state-owned and hence non-independent entities before the economic reforms started in 1978. There was no corporate income tax under the central planning system. Starting in 1979, a number of enterprise taxation reforms were introduced by the Chinese government (Cai and Liu 2009). One of the most important reforms was enacted in 1994 when the government introduced the "Corporate Income Tax Code" that overhauled corporate taxation. Under the code, all domestic firms pay a 33% corporate income tax rate, with the exception of some preferential tax treatment for certain types of firms from industries or provinces supported by the government.[14] As part of the new "Corporate Income Tax Code", the tax collection agencies were also reformed in 1994.[15] In 2008, the government modified the statutory corporate tax rates, and Chinese listed firms are now generally subject to the same statutory tax rate of 25%.

While most studies on tax planning focus on the U.S. market, tax planning is also prevalent in China. For example, the Chinese National Auditing Office uncovered 15.96 billion Chinese yuan (or RMB) as a result of tax planning activities in 2015 based on random investigations of selected firms in six provinces.[16] Fisman and Wei

[14] For example, the income tax rate for firms in the high-tech industry or from the western provinces (e.g., Sichuan and Guizhou) is 15%.

[15] Since the reform, taxes have been classified into central and local taxes, and a National Taxation Bureau and provincial bureaus are responsible for collecting central taxes and local taxes, respectively. Both of them are under the supervision of the State Administration of Taxation (Cai and Liu 2009). Under the reform, corporate income tax is classified as a central tax and is collected by the National Taxation bureau and its branches in all provinces.

[16] http://www.audit.gov.cn

(2004) reported pervasive tariff evasion in China.[17] The weak enforcement of the tax code and the difficulties encountered in collecting corporate taxes are the primary reasons for the widespread tax saving activities in China.[18]

2.2. Effect of MW Hikes on Tax Planning

Previous research in labor economics shows that MWs have a direct and significant impact on firms' operations. For example, MW hikes raise wages and reduce profitability (e.g., Draca, Machin, and Van Reenen 2011) and affect corporate pricing, financing, and investment decisions (e.g., MaCurdy 2015; Geng et al. 2017, 2018; Cho 2018; Gustafson and Kotter 2018). Following these studies, we argue that MW hikes represent a significant and negative shock for firms' operating costs and financial reporting performance for three reasons. First, MW hikes drive up the price of labor, which is a direct and major cost factor for most companies. Furthermore, increased insurance and housing funds along with MW hikes cause even greater operating pressure for companies.[19] Second, MW hikes make wages stickier and labor adjustment more costly. Specifically, MWs increase firms' share of fixed labor costs in total labor costs, which leads to higher operating leverage and a higher probability of financial distress (Luca and Luca 2018; Chava et al. 2018; Cui et al. 2018). As a result, MWs reduce firms' flexibility to adjust wages downward in response to production adjustments, thus exposing firms to the risk of not being able to mitigate the adverse impacts of future operating shocks (Kugler and Pica 2008;

[17] Ye, Hou, and Huang (2018) found that the average effective tax rate of Chinese listed companies is 19.25% over the period 1994-2017, much lower than the statutory rate of 33% before 2008 and 25% thereafter. They argued that exploiting favorable tax policies is one way to lower taxes. In China, common mechanisms for lowering corporate taxes include "shifting income to subsidiaries with a low tax rate by manipulating transfer prices, using different sales cutoff points for book and tax purposes, capitalizing repairs and betterment expenditures for book, but expensing them for tax, and overstating the costs and expenses of related-party transactions." (Tang, Mo, and Chan 2017, p248).

[18] For example, insufficient staff in the collection agency to deal with the increasing number of firms and a lack of training and skills in the collection agency to collect corporate income tax cause difficulties in collecting corporate taxes (Cai and Liu 2009).

[19] In the wage system of Chinese firms, insurance and housing funds are calculated on the basis of a base wage. Thus, MW hikes not only increase the direct wage but also increase the attached insurance and housing funds that should be paid by companies. According to a survey conducted by People's Daily, insurance and housing funds represent a heavy burden for most companies (see https://www.sohu.com/a/157962517_776948).

Ghaly, Dang, and Stathopoulos 2017; Nguyen 2018). Finally, the increase in both direct labor costs (i.e., base wage and the accompanying insurance and housing funds) and labor adjustment costs will contribute to a significant decline in companies' financial reporting performance, which creates additional pressure on top managers to boost performance.

We posit that the negative shock to firms' operating costs and performance due to MW hikes provide firms with incentives to save taxes through two potential mechanisms. First, the increased operating costs caused by MW hikes place extra pressure on firms' cash outflows. To mitigate the adverse effects of MW hikes on operations, firms have incentives to make more investments and adopt new technologies to offset growing labor costs (Geng et al. 2018). In this case, firms affected by MW hikes need additional financing to fund their investment (Geng et al. 2017). Compared with costly external financing sources, cash tax savings achieved through greater tax planning can be viewed as less costly, especially when firms are financially constrained (Law and Mills 2015; Edwards et al. 2016). Thus, we expect firms affected by MW hikes to engage in tax planning due to *cash saving incentives*. Prior to the MW hikes, the company would have already assessed the benefits of "tax financing" and the marginal cost of tax planning strategies. Thus, firms engage in more tax planning to generate internal funds only if the expected returns exceed the costs of marginal tax planning strategies. The anecdotal and academic evidence suggests that Chinese firms have additional opportunities to reduce taxes due to weak tax enforcement effectiveness (Lin et al. 2018). Second, MW hikes trigger a negative shock to financial reporting performance, which may lead to a higher likelihood of financial distress due to significantly increased costs and operating inflexibility (Chava et al. 2018). Financial distress has negative economic consequences in the

capital market and is very costly for firms and management, especially in China (Chen and Yuan 2004).[20] Tax planning strategies can help increase both net cash flows and reported earnings for publicly traded firms (Graham, Hanlon, Shevlin, and Shroff 2014).

Collectively, these arguments suggest that firms facing MW hikes will take actions to increase internally generated funds through greater tax planning because MW hikes lead to increased operating costs and a higher probability of financial distress, which decreases the accessibility of external funds and increases the need for internal sources of funds. We state our first hypothesis as follows:

H1: *A higher minimum wage is associated with greater tax planning.*

There are a number of reasons why we might not observe the hypothesized relation. First, firms have several alternative options to respond to higher labor costs due to MW hikes, including reducing hours worked or the number of employees or simply passing on the cost of the increased wages to consumers. Prior studies provide evidence that firms discharge workers or raise product prices when confronted with MW hikes (e.g., Brown 1999; Borjas 2004; MaCurdy 2015). We will not find any association between MW and tax planning if firms choose these non-tax options. Second, from a tax perspective, labor is fully tax deductible (De Vito 2018). The increase in labor costs arising from MW hikes and the corresponding tax deduction reduce the marginal benefit of tax planning. Finally, tax planning strategies can be risky activities and could be challenged by tax authorities, thus exposing the firms and managers to greater litigation and reputational risk. For these reasons, it is *ex ante* unclear whether MW will be associated with greater tax planning.

[20] In China, firms have strong incentives to manage earnings for regulatory reasons. To qualify for seasoned equity issuance, the firm must be profitable for three consecutive years. In addition, a firm that suffers from losses in two consecutive years will be subject to special treatment, e.g., a daily price change limit of five percent, and will risk being delisted from the stock exchange if it does not make a profit in the third year.

2.3. The Varying Impacts of MW Hikes

Hypothesis H1 outlines the average effects of MW hikes on tax planning. In theory, firms trade off marginal benefits and costs when making corporate tax decisions (Hanlon and Heitzman 2010). We expect that the effects of MW hikes on corporate tax planning will be more (less) pronounced when the marginal benefits (costs) of tax planning are larger.

2.3.1 Labor intensity

Firms with high labor intensity are more vulnerable to MW shocks than firms with low labor intensity, as the former rely more on human capital and are thus more exposed to the higher labor costs imposed by the MW (Cui et al. 2018; Geng et al. 2018). The marginal benefits from tax planning are expected to be larger for firms with high labor intensity. Thus, following MW hikes, we expect more labor-intensive firms to have greater tax planning than less labor-intensive firms.

2.3.2 Financial constraints

Financially constrained firms are more prone to adverse shocks arising from MW hikes. Traditional financing sources for financially constrained firms are more costly or less accessible (Edwards et al. 2016); tax planning strategies can serve as an alternate viable channel for financially constrained firms to generate less costly internal funds. We hence predict that financially constrained firms have incentives to engage in greater tax planning than the less financially constrained firms following MW hikes.

2.3.3 Product market power

Product market power can influence the marginal benefits of tax planning. When firms' product market power is stronger, they are capable of passing labor costs on to consumers through price increases to mitigate the negative effects of MW hikes (Geng

et al. 2018), which will in turn reduce the marginal benefits of tax planning. As such, we expect that industry leaders with strong product market power are less likely to engage in tax planning than non-industry leaders following MW hikes.

2.3.4 Tax enforcement

The exposure to litigation risk increases the marginal costs of tax planning. Firms are subject to greater litigation risk when there is more active enforcement of tax laws (Atwood, Drake, Myers and Myers 2012; Hoopes, Mescall and Pitman 2012). Consequently, we expect the effects of MW hikes on tax planning to be more (less) pronounced for firms in regions with lax (strong) tax enforcement.

We formally state these hypotheses below:

H2: *The effects of minimum wages on corporate tax planning are more pronounced in (i) more labor-intensive firms; (ii) financially constrained firms; (iii) firms with less product market power and (iv) firms located in regions with lax enforcement.*

3. Sample Selection and Research Design

3.1. Sample Selection

Our sample begins with all publicly traded firms covered by the CSMAR database between 2005 and 2017. The sample period starts in 2005 because the MW system was established nationwide by the Ministry of Labor and Social Security in 2004, and we use the one-year-lagged MW to predict corporate tax planning in the current year.[21] The MW data are manually collected from the MOHRSS and the Chinese Academy of Labor and Social Security. The dataset covers the MWs in all

[21] As reported in Xu, Kong, and Kong (2017, p.193), "early in 1994, the Chinese government has started to implement a minimum wage policy in various cities across the country. However, the minimum wage adjustment was less frequent in China before 2003; especially in 1998, during the Asian financial crisis, only one-fifth of all counties adjusted their minimum wages. In March 2004, the Ministry of Labor and Social Security passed additional regulations to further intensify the minimum wage policy, which formalized and regularized the process of minimum wage adjustment; by the end of 2004, the minimum wage system was established in the whole country."

cities in China between 2004 and 2017. MW changes typically apply to the city where an employee is working.[22] Consequently, following prior studies (e.g., Serfling 2016; Bai et al. 2019), we match the MW to the city where each firm is headquartered, which is also typically where major plants and operations are located. We remove firms in the financial industry because financial reporting in this industry is different from that of industrial firms. We eliminate observations lacking data needed to calculate all variables used in the empirical analyses. We exclude firm-year observations with negative pre-tax income because these firms may have different motivations for tax planning (Brown and Drake 2014). Our final sample has 17,759 firm-year observations consisting of 2,474 unique firms.

3.2. Measures of Tax Planning

Following prior studies (Edwards et al. 2016; Bradshaw, Liao, and Ma 2019), we use the cash effective tax rate (*CETR*) as our measure of tax planning outcomes, which is defined as cash income taxes paid, divided by pretax income.[23] We use it as our major dependent variable because we are interested in how firms respond to MW hikes in generating additional cash. A firm's cash ETR is the most direct measure of its cash tax burden, and tax planning that decreases its cash tax burden will have a direct impact on its cash ETR (Edwards et al. 2016). We winsorize *CETR* at 1 to minimize the influence of small-denominator problems, and the negative value is set to 0 (Bradshaw et al. 2019).

One limitation of the CETR measure is that it does not distinguish tax savings

[22] An ideal measure that captures the increase in a firm's labor costs following MW hikes would aggregate the number of workers who receive MWs at each of the firm's operating locations (Bai et al. 2019). However, the database provides only the state of incorporation and headquarters. We also do not have access to detailed plant-level data, which are not publicly available.

[23] Following Bradshaw et al. (2019), we calculate cash income taxes paid as current tax expense plus beginning-of-year income taxes payable minus end-of-year income taxes payable, due to non-disclosure of cash taxes paid for most of our sample years. Hanlon and Heitzman (2010, p. 139) caution that "the annual Cash ETR could mismatch the numerator and denominator if the cash taxes paid includes taxes paid on earnings in a different period (e.g., from an IRS audit completed in the current year) while the denominator includes only current period earnings." In China, all firms have the same calendar and fiscal year-ends (i.e., 31 December), so our data are not susceptible to this problem.

from tax preferences and aggressive tax activities. This concern affects our study because Chinese listed firms are subject to varying applicable tax rates (ATRs) that arise from numerous tax preferential policies (Tang et al. 2017; Bradshaw et al. 2019).[24] Following Tang et al. (2017), we use a modified cash ETR measured as cash ETR divided by the firm's ATR (*ModCETR*) to mitigate the concern that the cash ETRs are merely capturing ATRs, as our second measure of tax planning. The modified CETR controls for the differential ATR effect on cash ETR and allows us to capture the tax planning outcomes achieved by aggressive tax activities. Consistent with prior research, a lower (higher) *CETR* or *ModCETR* is associated with more (less) tax planning.

3.3. Measure of the Minimum Wage

We construct an annual MW measure by multiplying the December MW by 12 and use this annual MW measure to predict corporate tax planning. Nationwide MWs experienced rapid growth during the sample period. The mean MW in China was RMB 5,235 per year in 2004, which then more than tripled to RMB 18,505 in 2016. On average, the growth rate of MWs over the sample period is 11.4% per year with a large standard deviation of 12.0%. A similar pattern is also reported in Mayneris, Poncet, and Zhang (2018). MWs in China feature large cross-sectional and intertemporal variation. In Figure 1, we present the geographical distribution of MWs across China in four diagrams, each representing a selected sample year. In each diagram, we sort cities into quintiles according to their respective MW values, with each quintile marked in a different color. Significant geographical variation in MWs can be observed in each of the diagrams in Figure 1. In addition, most cities shift quintiles over time, as noted by the changing colors assigned to these cities. This

[24] It is important to control for the effects of ATRs in our setting because prior studies have found that MW hikes affect firms' investment activities (Geng et al. 2018). According to the tax rules in China, firms enjoy the tax preferential tax policies for R&D in certain industries, such as environmental protection industry.

suggests that the relative ranking of a city in terms of MWs is not stable but changes over time.

[Insert Figure 1 here]

3.4. Empirical Strategy

To examine the relation between the MW and tax planning outcomes, we estimate the following regression model:

$$y_{i,s,t} = \beta_0 + \beta_1 * Ln(MW)_{s,t-1} + \beta_2 X + \upsilon_i + \theta_k * \omega_t + \delta_p * \omega_t + \varepsilon_{i,s,t} \quad (1)$$

where the dependent variable $y_{i,s,t}$ is either the *CETR* or the modified measure (*ModCETR*) for firm *i* headquartered in city *s* in year *t*. The variable $Ln(MW)_{s,t-1}$ denotes the log value of the December MW in year *t-1* multiplied by 12. H1 predicts a negative relation between the MW and cash effective tax rates; thus, we expect a negative coefficient on $Ln(MW)_{s,t-1}$.

X is a vector of city- and firm-level control variables. We include two macroeconomic city-level variables: the log value of GDP per capita (*LnGDP*) and the growth rate of GDP (*GDPGR*) of the city where the firm is headquartered. We also include various firm characteristics to control for other factors that may affect firms' tax planning. Bradshaw et al. (2019) show lower tax planning by state-owned enterprises (SOEs) relative to non-SOEs; therefore, we control for SOEs (*SOE*) by defining an indicator variable equal to one if a firm is controlled by the state and zero otherwise. We control for firm size (*Size*) because larger firms may have access to more tax-planning strategies, resulting in lower taxes. On the other hand, larger firms may also be subject to heavier political pressure and greater scrutiny from the government, resulting in higher taxes. Chen et al. (2010) suggest that growing firms may undertake more investments in tax-favored assets that generate timing differences in the recognition of tax expenses. Therefore, we control for firm

growth measured by the book-to-market ratio (*BM*). We also control for the proportion of ownership of the largest shareholder to capture the influence of ownership concentration (*Ownership*) (Bradshaw et al. 2019). We control for firm performance (*ROA*) since firms with low profitability have less incentive to lower their taxes. We control for firm leverage (*Lev*), firm age (*Age*), capital intensity (*PPE*), and inventory intensity (*Inventory*) because prior research suggests that firms with complex operations are associated with tax planning (e.g., Rego 2003; Chen et al. 2010; McGuire et al. 2012; Brown and Drake 2014; Hasan, AI-Hadi, Taylor and Richardson 2017). We also control for the level of a firm's cash holdings (*Cash*) since financially constrained firms are likely to save more taxes (Edwards et al. 2016). All control variables are measured contemporaneously with the dependent variable because we expect these factors to be contemporaneously associated with tax planning (Chen et al. 2010). The detailed definitions of these variables are presented in Appendix A.

We follow Geng et al. (2018) and include firm fixed effects (υ_i), industry-year fixed effects ($\theta_k*\omega_t$), and province-year fixed effects ($\delta_s*\omega_t$) in Equation (1). The firm fixed effects control for time-invariant omitted firm characteristics and ensure that estimates of α_1 reflect average, within-firm changes in tax planning over time rather than simple cross-sectional correlations. Furthermore, the inclusion of industry-year fixed effects and province-year fixed effects removes any time-variant shocks at the industry and province levels, respectively.[25] We cluster estimated standard errors in the regressions at the city level. Since the MW varies at the city level, this clustering addresses the concern that residuals are serially correlated within a firm and correlated

[25] Specifically, province is the location where listed firms are incorporated. We control for province-year fixed effects since preferential tax policies vary substantially across provinces in China (Tang et al. 2017). Note that we cannot include city–year fixed effects in the regressions, as such fixed effects would, by definition, be perfectly correlated with our key variable, *Ln*(*MW*).

across firms within the same city (Bertrand, Duflo, and Mullainathan 2004).

4. Empirical Results

4.1. Descriptive Statistics

We present descriptive statistics for the sample used to estimate Equation (1) in Table 1. We winsorize all continuous variables except *CETR* and *ModCETR* at the 1 percent and 99 percent levels to mitigate the influence of outliers. Panel A of Table 1 reports the sample distribution by year. The mean and median *CETR* (*ModCETR*) in Panel B of Table 1 are 19.6% (1.039) and 14.7% (0.813), respectively, which are consistent with those reported in prior studies (e.g., Bradshaw et al. 2019). On average, the natural logarithm of the annualized MW is 9.438, or RMB 12,557. In Panel C, we report the correlation matrix for key variables. Our tax planning measures, *CETR* and *ModCETR*, in year *t* are negatively associated with MW in year *t-1* ($Ln(MW)_{t-1}$), which provides preliminary support for our prediction.

[Insert Table 1 here]

4.2. Baseline Results

Table 2 presents the results of estimating Equation (1). As shown in columns (1) and (2), the coefficients on $Ln(MW)_{t-1}$ are negative and significant at the 5% or 1% level.[26] The results indicate that, all else being equal, higher MWs are associated with greater subsequent tax planning, as reflected in lower $CETR_t$ or $ModCETR_t$. Compared with a baseline unconditional mean value of $CETR_t$ of 19.6 percent (see Table 1), the estimate of $Ln(MW)_{t-1}$ at -0.108 in column (1) indicates that a 10% increase in MW implies a 1.08 percentage-point decrease in $CETR_t$, which amounts to a 5.51 (=1.08/19.6) percent reduction in *CETR*. Considering the rapid growth of MWs at 11.4% per year, the economic impact of MWs is non-trivial during the sample

[26] The smaller sample size in Column (2) than in Column (1) is due to missing ATR for some firms.

period.

With regard to the control variables, the coefficients on *Size*, *ROA* and *PPE* are negative and statistically significant, indicating that firms that are larger, more profitable, and have more capital expenditures have lower cash ETRs. Furthermore, higher cash ETRs are associated with firms reporting higher levels of inventory. Collectively, these results are generally consistent with prior studies.

[Insert Table 2 here]

4.3. Econometric Concerns

Although MW policy is likely exogenous to individual firms, there is still an endogeneity concern that an omitted economic characteristic could be correlated with both MW changes and changes in corporate tax strategies, leading to a spurious relation between MW hikes and tax planning. Our fixed effects regressions in Equation (1) that control for firm, industry-year and province-year heterogeneity should, to a certain extent, alleviate this concern. In the following sections, we conduct additional empirical analyses to further alleviate the endogeneity concerns.

4.3.1 City-pair analysis

To overcome the omitted economic variable problem, we follow Geng et al. (2018) and exploit the discontinuities in MWs at city borders and directly compare tax planning outcomes of firms located within a pair of contiguous cities that may adopt different MWs. Contiguous cities act as good controls because their geographical proximity tends to minimize the effects of omitted factors while exhibiting variations in MW. For each city, we identify its closest city by its distance using ArcGIS. We drop any cross-province city-pairs that straddle two provinces to prevent endogeneity being introduced from other sources, such as different regulatory patterns and business cycles. We further require each city in a city-pair to contain at least one firm

in each year. We then merge the contiguous city-pair dataset with the firm-year data. As a city can border multiple neighboring cities and thus appear in multiple city-pairs, a firm-year observation located in such a city can repeatedly appear in the dataset; each instance is identified by a distinct city-pair in our regression sample. These criteria result in 140 unique city-pairs and 16,797 firm-year observations.

The contiguous city-pair identification strategy assumes that firms and labor do not mobilize in response to MW hikes. First, we argue that a firm's location decision in China is not likely to be affected by MW policy. The relocation of a company such as manufacturing firms often involves purchasing land parcels, which is strictly controlled by the government, and building new plants would require government approval that imposes very high costs on firms. Second, it is possible that labor costs would increase in a low-MW area due to the reduced labor supply, as workers may be attracted to a neighboring city paying a higher MW and thus weaken the treatment effects of MW hikes. This labor mobility driven by MWs would bias our estimate downward. All else being equal, our reported finding would be stronger if we were able to account for labor mobility in our analyses.

We report the regression results using the city-pair sample in Table 3. The coefficients on $Ln(MW)_{t-1}$ are negative and statistically significant in both specifications, which is consistent with our earlier findings. Thus, our results are robust to excluding potential economic characteristics that might be correlated with both MW changes and changes in corporate tax planning.

[Insert Table 3 here]

4.3.2 Change analysis

Next, to control for the unobservable time-invariant characteristics that possibly drive both tax planning and MW hikes, we re-estimate model (1) by replacing each

level variable with its first-differenced variable (change model), where the change in tax planning is regressed on the change in MWs.

The results are reported in Table 4. The negative and statistically significant coefficients on $\Delta Ln(MW)_{s,t-1}$ in both columns (1) and (2) confirm our main finding that an increase in the MW is followed by a decrease in firms' future cash effective tax rates.[27] The results suggest that the relation between MWs and tax planning is not likely driven by unobservable time-invariant factors.

[Insert Table 4 here]

4.3.3 Difference-in-differences regression

Our final strategy exploits an exogenous shock to the enforcement of MWs as a result of the enactment of the LCL in 2008. The LCL enacted in 2008 legislatively established the importance of MW policies, and MWs became one of the key components of China's labor market regulations (Huang et al. 2014).[28] The process of MW adjustment became more formal and regular following the enactment of the LCL. During our sample period, 49% of local governments implemented upward adjustments in the MW in the pre-LCL period, whereas the share increases to 64% in the post-LCL period. These statistics suggest ~~the~~that unexpected labor regulation triggered an exogenous increase in MWs. Park, Giles, and Du (2012) use a survey of 1,644 manufacturing firms and find that the LCL increases firms' labor costs.

Using the exogenous shock to MWs brought about by the enactment of the LCL in 2008, we perform a difference-in-difference test to establish the causal impact of

[27] Following Nguyen (2018), all control variables are expressed in changes, and we drop firm fixed effects. However, our results remain unchanged if we control for firm fixed effects.

[28] In 2003, the Chinese government announced that the LCL would be included in future legislation; in 2005, the government proposed a preliminary draft of the LCL for further comments and suggestions; in 2007, the formal LCL was passed by the National People's Congress of China, which came into effect on January 1, 2008. The LCL emphasizes the protection of the fundamental rights of workers and requires companies to sign formally written contracts with workers (Cui et al. 2018). A clear definition of the time limit of labor contracts, especially for the probationary period that had been abused by employers to reduce labor costs before the law was enacted, is specified in the LCL in 2008. In addition, the LCL explicitly specifies penalties for violations, which trigger stricter enforcement of the MW across companies.

MW hikes on tax planning.[29] We construct an indicator variable *POST* for the enactment year of the LCL, which is coded as one for 2008 and thereafter, zero otherwise. Prior studies suggest that changes in labor protection regulations lead to diverse effects on firms with varying labor intensities, which generally show a greater negative impact in more labor-intensive sectors (Ahsan and Pagés 2009; Ni and Zhu 2018). We therefore construct treatment groups and control groups according to the relative labor intensity of industries. Following Geng et al. (2018) and Gustafson and Kotter (2018), we assign firm-year observations in relatively more (less) labor-intensive industries to the treatment (control) group. Industry-level labor intensity is measured as the median number of employees in a firm divided by total fixed assets in its two-digit industry in a given year. We sort all two-digit industries in our sample by labor intensity and construct an indicator variable *TREAT* for more labor-intensive industries, which equals one if the intensity measure is above the sample median and zero otherwise.

Our DID model is specified as follows:

$$y_{i,s,t+1} = \beta_0 + \beta_1 * TREAT_{k,t} + \beta_2 * POST_t * TREAT_{k,t} + \beta_3 X + \upsilon_i + \theta_k * \omega_t + \delta_p * \omega_t + \varepsilon_{i,s,t} \quad (2)$$

Equation (2) is the same as Equation (1) except that we interact the LCL dummy variable ($POST_t$) with a variable indicating whether an industry k in year t is more labor-intensive ($TREAT_{k,t}$).[30] The main effect of *POST* is not included because we control for the industry- and province-year fixed effects in the model. We report the estimation results for Equation (2) in columns (1) and (2) of Table 5. The coefficient on the interaction term, $POST_t * TREAT_{k,t}$, is negative and statistically significant for both measures of tax planning outcomes. The evidence suggests that treated firms

[29] The National People's Congress of China passed the LCL in 2007, and it came into effect on January 1, 2008. It is unclear whether companies would have been affected by LCL in 2007. Therefore, we drop 2007 from the sample. However, our results are similar if we add 2007 as the pre-event year.

[30] We require the tax planning measure in year *t+1*, and hence, the sample size for this test is smaller than those in Table 2.

save relatively more cash taxes in the post-LCL period than in the pre-LCL period. In summary, the DID analysis supports a causal interpretation of the impact of MW hikes on corporate tax planning.

[Insert Table 5 here]

Next, we compare the effect of the LCL on tax planning between the treatment and control firms with varying ~~level~~levels of MWs. We contend that the LCL should affect tax planning for the treatment firms in high-MW cities more than those in low-MW cities.[31] To test this conjecture, we run the following triple-differences (difference-in-difference-in-differences) specification following Ghaly et al. (2017):

$$y_{i,s,t+1} = \beta_0 + \beta_1 * TREAT_{k,t} + \beta_2 * POST_t * TREAT_{k,t} + \beta_3 * HighMW_{i,s,t} + \beta_4 * POST_t * HighMW_{i,s,t}$$
$$+ \beta_5 * TREAT_{k,t} * HighMW_{i,s,t} + \beta_6 * POST_t * TREAT_{k,t} * HighMW_{i,s,t} + \beta_7 X + \upsilon_i + \theta_k * \omega_t$$
$$+ \delta_p * \omega_t + \varepsilon_{i,s,t} \quad (3)$$

Equation (3) is similar to Equation (2) except that we interact $HighMW_{i,s,t}$, an indicator variable that equals one for firms headquartered in cities with an MW above the sample median and zero otherwise, with $POST_t$, $TREAT_{k,t}$, and $POST_t * TREAT_{k,t}$. Consistent with our prediction, the results reported in columns (3) and (4) of Table 5 show that the coefficient on the triple interaction term ($POST_t * TREAT_{k,t} * HighMW_{i,s,t}$) is negative and highly significant for both measures of tax planning outcomes.[32]

4.4. Cross-sectional Analyses

We conduct a cross-sectional analysis that lends further credence to the causal relation between MW and corporate tax planning, as it is arguably more difficult to find omitted correlated variables that can simultaneously explain our main and cross-sectional results. We use the following model to conduct cross-sectional

[31] We assume that the enforcement of the MW in both high-MW and low-MW cities was strengthened as a result of LCL enactment. Given that the negative effects of MW hikes on firms' operating costs are considerably more pronounced for firms headquartered in high-MW cities, we predict that such firms should be affected more by the enforcement of MWs caused by the LCL.

[32] Note that $HighMW_{i,s,t}$ and $TREAT_{k,t} * HighMW_{i,s,t}$ are dropped from the regressions because of multicollinearity concerns.

analyses as outlined in H2:

$$y_{i,s,t} = \beta_0 + \beta_1 * Ln(MW)_{s,t-1} + \beta_2 * Ln(MW)_{s,t-1} * Mod\_Var_{i,s,t} + \beta_3 * Mod\_Var_{i,s,t} + \beta_4 X + \upsilon_i + \theta_k * \omega_t + \delta_p * \omega_t + \varepsilon_{i,s,t} \quad (4)$$

Equation (4) is the same as Equation (1), except that we include the moderating variable ($Mod\_Var_{i,s,t}$) and its interaction with $Ln(MW)_{s,t-1}$ to test H2.

4.4.1 Variations in labor intensity

In H2, we predict that the effects of MW hikes on tax planning outcomes are more pronounced for labor-intensive firms than their non-labor-intensive counterparts. We define labor intensity (*LaborInt*) as an indicator variable that equals one for firms with labor intensity in the top tertile of the sample distribution and zero otherwise. Following Geng et al. (2018), labor intensity is measured by firm wage expenditure divided by operating cash flow. We report the results in columns (1) and (2) of Table 6. The coefficient on $Ln(MW)_{t-1} * LaborInt_t$ is negative and statistically significant in both columns. The results suggest that the impact of MW hikes on tax planning is more pronounced for labor-intensive firms because the marginal benefit of additional tax planning is greater.

4.4.2 Variations in financial constraints

Financial constraints are a critical determinant of firm tax behavior (Edwards et al. 2016), particularly for firms in a transitional economy. Tight financing constraints not only make it difficult for firms to raise capital as MW hikes drive up labor costs, but also cause a greater decline in performance, placing pressure on the firm to conserve more cash. In H2, we predict greater tax planning following MW hikes when the firm is more financially constrained.

We measure financial constraints ($FC_{i,s,t}$) based on the extent to which firms depend on external capital (Bai et al. 2019), which is an indicator variable that equals

one for firms with capital expenditures that exceed operating cash flows, zero otherwise.

We report the results in columns (3) and (4) of Table 6. We find that the coefficients on $Ln(MW)_{t-1}*FC_t$ are negative and significant at the 1% level in both columns, indicating that the effects of MW hikes on tax planning are more pronounced for more financially constrained firms. The results suggest that the marginal benefits of additional tax planning strategies are greater for financially constrained firms when MWs are increased.

4.4.3 Variations in product market power

Prior studies on MW policies have shown that firms can pass the MW-induced labor costs on to consumers by raising product prices.[33] Therefore, the degree of tax planning induced by a rising wage floor is contingent on the possibility of this pass-through process. H2 predicts that the effect of the MW on tax planning is less pronounced for firms with more product market power since these firms can pass the higher labor costs on to consumers without the need to engage in tax planning.

Following Gaspar and Massa (2006), product market power (*MarketPower*) is defined as the difference between a firm's operating profit margin and the average operating profit margin of its two-digit industry. We report the results in columns (5) and (6) of Table 6. The coefficient on $Ln(MW)_{t-1}*MarketPower_t$ is positive and significant, consistent with our prediction in H2.

4.4.4 Variations in tax enforcement

An effective judicial system is an important determinant of economic growth (North 1990). Specifically, active enforcement of tax laws should result in lower corporate tax planning (Atwood et al. 2012; Hoopes et al. 2012). In H2, we predict

[33] See Aaronson (2001) and Aaronson and French (2007) for evidence that a firm's response to the MW depends on the pass-through of the increased labor costs.

that the effect of MW hikes is stronger in regions with lax enforcement, where the marginal cost of engaging in tax planning is lower.

In China, the effectiveness of legal institutions varies across regions (Cull and Xu 2005). To explore the institutional heterogeneity of tax enforcement, we use the index of the regional legal environment ($TaxEnforce_{i,s,t}$) developed by Fan and Wang (2011) that rates the development of the legal framework in each city. A higher value of $TaxEnforce_{i,s,t}$ is associated with greater tax enforcement.

The regression results for this analysis are reported in columns (7) and (8) of Table 6. Consistent with our prediction, the coefficient of $Ln(MW)_{t-1}*TaxEnforce_t$ is significantly positive, suggesting that tax planning is greater in regions with lax enforcement. This result suggests that the legal system plays an important role in the interaction between labor market policies and corporate tax planning.

4.5. Effect of the MW on Domestic Income Shifting

In our main analysis, we investigate whether MV hikes induce firms to save more taxes. In China, a common tax planning strategy is domestic income shifting within a book-consolidated business group (Shevlin, Tang, and Wilson 2012; Cai and Liu 2009; Lin et al. 2018). Hence, we focus on this income-shifting tax strategy and investigate whether the influence of MW hikes on firms' tax planning extends to this specific tax strategy.

As documented in Shevlin et al. (2012), the variations in tax rates among the members of a consolidated group provide strong incentives for Chinese firms to shift income to entities subject to lower taxes within the consolidated group. Following Lin et al. (2018), we model a firm's opportunity to shift income to reduce tax burdens as a joint function of the spread of tax rates across members of the consolidated group and the magnitude of intragroup transactions and define *Shifting* as the product of the

difference between the highest and lowest statutory tax rates faced by any group member and the aggregate amount of related transactions scaled by either the lagged assets or sales of the group. We then transform the range into a dummy variable that equals one if the group is in the top decile of the rate range and zero otherwise.

[Insert Table 7 here]

We replace the dependent variable in Equation (1) with income shifting (*Shifting*) and report the results in Table 7. The coefficient on $Ln(MW)_{t-1}$ is positive and significant, suggesting that the effect of MV hikes on firms' tax planning extends to a specific tax strategy in China: income shifting.

4.6 Additional Robustness Checks

4.6.1 Geographically dispersed operations

MWs typically apply in the city where an employee works, and in our main results, we match MWs to a firm's headquarters in a city due to data availability. Consequently, our research design should better capture the effect of MW hikes on firms' labor costs for firms that have more geographically concentrated operations. As a robustness check, we exclude firms in industries in which a large percentage of the workforce is likely geographically dispersed, which include retail, wholesale, and transportation (Agrawal and Matsa 2013; and Serfling 2016), and re-investigate the impact of MW hikes. Table 8, Panel A presents the results of this analysis. As expected, we still find a strong effect of MW hikes on tax planning outcomes in this reduced sample.

4.6.2 Alternative measures of tax planning

In our main results, we use cash ETR in year *t* as the proxy for tax planning outcomes. Some tax planning strategies take a longer time to implement. To examine the long-term tax effects of MW hikes, we use two alternative measures of tax

planning. Following Brown and Drake (2014), we use a three-year average measure of cash ETR (*CETR3Yr*) and the modified measure (*ModCETR3Yr*) (from year *t* to *t+2*) to proxy for tax planning outcomes. We report the results in Table 8, Panel B. Overall, our main inferences remain unchanged for these alternate measures of tax planning outcomes.

[Insert Table 8 here]

5. Conclusions

The implementation of MWs has been a controversial public policy. The debate surrounding the effects of MWs on employment has continued since the first legislation in the U.S. in 1938 and appears to remain inconclusive despite having lasted for almost a century. Recent studies have examined how the MW affects firms' financing and investment decisions. We extend these prior studies by examining the effects of MWs on corporate tax planning.

Using inter-temporal variation in MW policies in China where over 1,300 local MW changes were implemented during the period 2005-2017, we find that higher MWs cause firms to engage in greater tax planning to save cash taxes. The results of several robustness tests provide support for a causal interpretation of our finding. In cross-sectional analysis, we find that the effect of MW hikes on tax planning is more pronounced for firms with higher labor intensity and greater financial constraints, for firms with less market power and in regions with lax enforcement.

These findings are generally consistent with theories predicting that MW hikes increase a firm's risk of becoming distressed by making wages stickier and labor adjustment costlier, which in turn incentivize firms to engage in tax planning activities to mitigate the adverse effects of the MW. Our study highlights the interaction of MW policies and corporate tax planning behavior and provides insights into how labor

market frictions could affect corporate decisions.

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Appendix A Variable Definitions

Variables	Definition
CETR	Cash effective tax rate, measured as current income tax expense, minus end-of-the-year tax payable, plus start-of-the-year tax payable, divided by pre-tax income.
ModCETR	Modified cash ETR, measured as the firm's cash effective tax rate (*CETR*) divided by the firm's applicable tax rate (ATR)
Ln(*MW*)	The natural logarithm of annualized minimum wage, defined as the monthly minimum wage of city in December multiplied by 12.
GDPGR	The percentage change in GDP of the firm's headquarters city from year t-1 to year t.
LnGDP	Log value of GDP per capita (in tens of thousands of RMB) of the city where the firm is headquartered.
SOE	An indicator variable that equals 1 if the firm is state controlled and 0 otherwise.
Size	The natural logarithm of total sales, measured at fiscal year end.
BM	Book-to-market ratio, measured as the book value of equity divided by the market value of equity, measured at fiscal year end.
Ownership	Ownership concentration, measured as ownership of the largest shareholder, measured at fiscal year end.
ROA	Net income divided by total assets, measured at fiscal year end.
Lev	Total liabilities divided by total assets, measured at fiscal year end.
Age	The natural logarithm of the number of years since the firm was listed on the stock exchange.
PPE	Net PPE scaled by total assets, measured at fiscal year end.
Inventory	Inventory intensity, measured as inventory scaled by the total sales, measured at fiscal year end.
Cash	Cash holding, measured as cash and cash equivalents scaled by total assets, measured at fiscal year end.
Δ*Ln*(*MW*)	Change in the natural logarithm of annualized minimum wage.
POST	An indicator variable for the enactment year of the Labor Contract Law in 2008, which is one from 2008 onwards, zero otherwise
TREAT	An indicator variable for more labor-intensive industries, which equals one if the intensity measure is above the sample median, zero otherwise. The intensity measure is defined as the median of the firm's number of employees divided by total fixed assets (in thousands of RMB) in its two-digit industry in a given year.
HighMW	An indicator variable that equals one for firms headquartered in cities with minimum wage above the sample median, zero otherwise.
LaborInt	An indicator variable that equals one for firms with labor intensity in the top tertile of sample distribution, zero otherwise. Labor intensity is defined as the firm's wage expenditures (in the cash flow statement) divided by operating cash flow.
FC	An indicator variable that equals one for firms that depend on external capital, namely those with capital expenditures that exceed operating cash flows, zero otherwise (Bai et al. 2019).
TaxEnforce	Tax enforcement is measured by an index of the regional legal environment from Fan and Wang (2011).
MarketPower	Product market power, defined as the difference between a firm's operating profit margin and the average operating profit margin of its two-digit industry (Gaspar and Massa 2006).
Shifting (scaled by	Opportunity to shift income for tax reasons, defined as the product of the

assets)	difference between the highest and lowest statutory tax rates faced by any group member (i.e., the rate range) and the aggregate dollar amount of related transactions (scaled by the lagged assets of the group). We then transform the range into a dummy variable that equals one if the group is in the top decile of the rate range and zero otherwise.
Shifting (scaled by sales)	Opportunity to shift income for tax reasons, defined as the product of the difference between the highest and lowest statutory tax rates faced by any group member (i.e., the rate range) and the aggregate dollar amount of related transactions (scaled by the lagged sales of the group). We then transform the range into a dummy variable that equals one if the group is in the top decile of the rate range and zero otherwise.
CETR3Yr	A three-year average measure of cash effective tax rate (from year *t* to *t+2*).
ModCETR3Yr	A three-year average measure of modified cash effective tax rate (from year *t* to *t+2*).
Wage	Firm wage expenditure, defined as firm wage expenditures (in the cash flow statement) divided by total operating cash outflow.
ProfitMargin	An indicator variable that equals one for firms with a profit margin in the top quartile of the sample distribution, zero otherwise. Profit margin is defined as total sales minus total costs, divided by total sales.

Table 1: Summary Statistics

This table reports summary statistics for the main variables in the regression models. Panel A reports the sample distribution by year. Panels B and C present descriptive statistics and correlation matrices for key variables used in our regression analysis. Pearson correlation figures are shown in bold if they are significant at the 10 percent level. The sample period is 2005-2017. All the continuous variables are winsorized at 1 and 99 percent. All variables are defined in Appendix A.

Panel A: Sample distribution by year

Year	Obs.	Percentage (%)
2005	740	4.17
2006	764	4.30
2007	861	4.85
2008	855	4.81
2009	979	5.51
2010	1146	6.45
2011	1463	8.24
2012	1614	9.09
2013	1748	9.84
2014	1770	9.97
2015	1775	9.99
2016	2002	11.27
2017	2042	11.50
Total	17759	100

Panel B: Summary statistics

Variables	Mean	Std. Dev	P25	Median	P75
$CETR_t$	0.196	0.208	0.062	0.147	0.252
$ModCETR_t$	1.039	1.126	0.352	0.813	1.275
$Ln(MW)_{t-1}$	9.438	0.436	9.125	9.506	9.788
$GDPGR_t$	0.125	0.058	0.086	0.115	0.158
$Ln\text{GDP}_t$	2.080	0.484	1.783	2.153	2.440
SOE_t	0.453	0.498	0	0	1
$Size_t$	21.410	1.385	20.440	21.250	22.200
BM_t	0.737	0.621	0.330	0.540	0.918
$Ownership_t$	0.361	0.150	0.241	0.343	0.469
ROA_t	0.063	0.054	0.025	0.050	0.085
Lev_t	0.423	0.199	0.264	0.425	0.580
Age_t	1.997	0.763	1.386	2.079	2.639
PPE_t	0.232	0.168	0.102	0.199	0.327
$Inventory_t$	0.352	0.557	0.104	0.192	0.342
$Cash_t$	0.195	0.136	0.098	0.157	0.254

Panel C: Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1)$CETR_t$														
(2)$ModCETR_t$	**0.92**													
(3)$Ln(MW)_{t-1}$	**-0.13**	**-0.08**												
(4)$GDPGR_t$	**0.07**	**0.06**	**-0.58**											
(5)LnGDP$_t$	**-0.11**	**-0.07**	**0.81**	**-0.37**										
(6)SOE_t	**0.12**	**0.05**	**-0.29**	**0.18**	**-0.24**									
(7)$Size_t$	**0.04**	**-0.01**	**0.12**	**-0.06**	**0.10**	**0.31**								
(8)BM_t	**0.09**	**0.05**	**-0.30**	**0.19**	**-0.21**	**0.14**	**0.14**							
(9)$Ownership_t$	**0.02**	0.00	**-0.07**	**0.04**	**-0.02**	**0.23**	**0.22**	**0.23**						
(10)ROA_t	**-0.26**	**-0.23**	0.01	**0.04**	**0.02**	**-0.15**	0.01	**-0.13**	**0.07**					
(11)Lev_t	**0.14**	**0.07**	**-0.13**	**0.08**	**-0.08**	**0.31**	**0.53**	**0.04**	**0.06**	**-0.34**				
(12)Age_t	**0.11**	**0.03**	**0.04**	**-0.04**	0.00	**0.44**	**0.37**	**-0.17**	**-0.07**	**-0.22**	**0.38**			
(13)PPE_t	**0.07**	**0.03**	**-0.27**	**0.09**	**-0.28**	**0.23**	**0.10**	**0.15**	**0.11**	**-0.12**	**0.07**	**0.09**		
(14)$Inventory_t$	**0.09**	**0.04**	**0.02**	**-0.01**	**0.04**	**0.03**	**-0.07**	**0.02**	0.01	**-0.16**	**0.24**	**0.15**	**-0.31**	
(15)$Cash_t$	**-0.07**	**-0.02**	**0.02**	**0.03**	**0.08**	**-0.15**	**-0.22**	**-0.02**	-0.01	**0.27**	**-0.40**	**-0.30**	**-0.37**	**-0.13**

Table 2: Regression of Minimum Wage on Subsequent Tax Planning (H1)

This table presents the regression results of future tax planning on minimum wages. All variables are defined in Appendix A. The *t*-statistics, computed with robust standard errors clustered at the city level, are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
	$CETR_t$	$ModCETR_t$
$Ln(MW)_{t-1}$	**-0.108****	**-0.860*****
	(-2.46)	**(-3.35)**
$GDPGR_t$	0.023	0.364
	(0.40)	(1.16)
$Ln\text{GDP}_t$	-0.049	-0.145
	(-1.45)	(-0.78)
SOE_t	-0.014	-0.068
	(-0.93)	(-0.99)
$Size_t$	-0.013**	-0.084***
	(-2.27)	(-2.95)
BM_t	0.003	0.044*
	(0.65)	(1.67)
$Ownership_t$	0.000	-0.000
	(0.14)	(-0.21)
ROA_t	-1.132***	-6.073***
	(-20.80)	(-21.55)
Lev_t	-0.036*	-0.228*
	(-1.70)	(-1.79)
Age_t	-0.012	-0.043
	(-1.35)	(-0.86)
PPE_t	-0.052*	-0.393***
	(-1.96)	(-2.80)
$Inventory_t$	0.046***	0.177***
	(5.66)	(3.54)
$Cash_t$	0.003	0.006
	(0.15)	(0.06)
Intercept	1.703***	11.829***
	(4.35)	(5.10)
Firm fixed effects	YES	YES
Industry-year fixed effects	YES	YES
Province-year fixed effects	YES	YES
Obs. No.	17759	17427
Adj R^2	0.156	0.115

Table 3: City-pair analysis

This table reports results from OLS regressions relating the minimum wage and future tax planning using a city-pair sample. All variables are defined in Appendix A. The *t*-statistics, computed with robust standard errors clustered at the city-pair level, are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
	$CETR_t$	$ModCETR_t$
$Ln(MW)_{t-1}$	**-0.143****	**-1.433*****
	(-1.99)	**(-2.92)**
$GDPGR_t$	-0.052	-0.194
	(-0.35)	(-0.22)
$LnGDP_t$	-0.053	-0.113
	(-0.87)	(-0.31)
SOE_t	-0.047**	-0.252***
	(-2.45)	(-3.00)
$Size_t$	-0.019***	-0.101***
	(-3.11)	(-2.86)
BM_t	0.007	0.064*
	(1.15)	(1.93)
$Ownership_t$	0.000	0.001
	(1.47)	(0.95)
ROA_t	-1.043***	-5.720***
	(-19.76)	(-24.32)
Lev_t	-0.015	-0.099
	(-0.80)	(-0.88)
Age_t	-0.011	-0.048
	(-1.30)	(-0.86)
PPE_t	-0.024	-0.267
	(-0.77)	(-1.61)
$Inventory_t$	0.048***	0.191***
	(5.64)	(3.83)
$Cash_t$	0.003	0.011
	(0.22)	(0.11)
Intercept	2.155***	17.548***
	(2.98)	(3.77)
Firm fixed effects	YES	YES
Industry-year fixed effects	YES	YES
Pair-year fixed effects	YES	YES
Obs. No.	16797	16557
Adj R^2	0.213	0.172

Table 4: Change analysis

This table reports results from a change analysis relating changes in the minimum wage and changes in future tax planning. All variables are defined in Appendix A. The *t*-statistics, computed with robust standard errors clustered at the city level, are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
	$\Delta CETR_t$	$\Delta ModCETR_t$
$\Delta Ln(MW)_{t-1}$	**-0.163*** **	**-0.783** **
	(-2.63)	**(-2.23)**
$\Delta GDPGR_t$	0.010*	0.071**
	(1.91)	(2.38)
$\Delta Ln\text{GDP}_t$	-0.021	0.194
	(-0.18)	(0.30)
ΔSOE_t	-0.027	-0.149
	(-1.17)	(-1.35)
$\Delta Size_t$	-0.088***	-0.470***
	(-6.16)	(-6.03)
ΔBM_t	0.016**	0.083**
	(2.06)	(2.02)
$\Delta Ownership_t$	-0.001	-0.009**
	(-1.61)	(-2.09)
ΔROA_t	-1.133***	-6.224***
	(-20.57)	(-18.26)
ΔLev_t	-0.005	-0.147
	(-0.14)	(-0.69)
ΔAge_t	-0.028**	-0.189***
	(-2.36)	(-2.62)
ΔPPE_t	-0.063	-0.463*
	(-1.41)	(-1.93)
$\Delta Inventory_t$	0.078***	0.304***
	(4.58)	(3.57)
$\Delta Cash_t$	0.007	-0.011
	(0.27)	(-0.07)
Intercept	0.033***	0.162***
	(3.62)	(3.32)
Industry-year fixed effects	YES	YES
Province-year fixed effects	YES	YES
Obs. No.	14344	13994
Adj R^2	0.090	0.086

Table 5: Difference-in-differences regression

This table reports results from DiD regressions in which *POST*TREAT* is the difference-in-differences estimator. *HighMW* is an indicator variable that equals one for firms headquartered in cities with minimum wages above the sample median and zero otherwise. The variables *HighMW* and *TREAT*HighMW* are subsumed by *POST*HighMW* and *POST*TREAT*HighMW,* respectively, due to perfect collinearity. All variables are defined in Appendix A. The *t*-statistics, computed with robust standard errors clustered at the city level, are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
	$CETR_{t+1}$	$ModCETR_{t+1}$	$CETR_{t+1}$	$ModCETR_{t+1}$
$POST_t$*$TREAT_t$* $HighMW_t$			**-0.017****	**-0.097****
			(-2.28)	**(-2.00)**
$POST_t$*$HighMW_t$			0.014	0.049
			(1.43)	(0.95)
$POST_t$*$TREAT_t$	**-0.029****	**-0.133****	**-0.023**	**-0.103**
	(-2.12)	**(-2.14)**	**(-1.62)**	**(-1.52)**
$TREAT_t$	0.014	0.053	0.017	0.068
	(1.11)	(0.93)	(1.35)	(1.24)
$GDPGR_t$	0.033	0.424	0.034	0.448
	(0.48)	(1.19)	(0.49)	(1.25)
LnGDP_t	-0.047	-0.091	-0.046	-0.093
	(-1.56)	(-0.47)	(-1.51)	(-0.48)
SOE_t	-0.001	0.053	-0.001	0.053
	(-0.04)	(0.49)	(-0.05)	(0.48)
$Size_t$	0.026***	0.121***	0.027***	0.127***
	(3.27)	(3.06)	(3.37)	(3.21)
BM_t	0.000	0.022	-0.000	0.021
	(0.04)	(0.97)	(-0.00)	(0.92)
$Ownership_t$	0.000	-0.001	0.000	-0.001
	(0.07)	(-0.39)	(0.01)	(-0.45)
ROA_t	-0.153***	-0.575**	-0.152***	-0.577**
	(-2.95)	(-2.01)	(-2.94)	(-2.02)
Lev_t	-0.028	-0.120	-0.028	-0.120
	(-1.27)	(-0.88)	(-1.28)	(-0.87)
Age_t	0.016	0.111**	0.017	0.112**
	(1.60)	(2.18)	(1.63)	(2.19)
PPE_t	-0.095***	-0.641***	-0.098***	-0.656***
	(-3.76)	(-4.89)	(-3.97)	(-5.12)
$Inventory_t$	-0.002	-0.023	-0.002	-0.021
	(-0.27)	(-0.58)	(-0.24)	(-0.53)
$Cash_t$	0.028	0.146	0.028	0.140
	(1.39)	(1.31)	(1.36)	(1.27)
Intercept	-0.271	-1.433	-0.295	-1.557*
	(-1.46)	(-1.65)	(-1.60)	(-1.80)
Firm fixed effects	YES	YES	YES	YES
Industry-year fixed effects	YES	YES	YES	YES
Province-year fixed effects	YES	YES	YES	YES
Obs. No.	13731	13491	13731	13491
Adj R^2	0.099	0.066	0.099	0.067

Table 6: Cross-sectional analyses

This table presents results of the cross-sectional analyses. Columns (1) and (2) report the regression results on the minimum wage and future tax planning based on labor intensity; Columns (3) and (4) report the regression results on the minimum wage and future tax planning based on financial constraints; Columns (5) and (6) report the regression results on the minimum wage and future tax planning based on product market power; and Columns (7) and (8) report the regression results on the minimum wage and future tax planning based on tax enforcement. All variables are defined in Appendix A. The *t*-statistics, computed with robust standard errors clustered at the city level, are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$CETR_t$	$ModCETR_t$	$CETR_t$	$ModCETR_t$	$CETR_t$	$ModCETR_t$	$CETR_t$	$ModCETR_t$
$Ln(MW)_{t-1}$	-0.123**	-0.918***	-0.098**	-0.800***	-0.123***	-0.929***	-0.169***	-1.050***
	(-2.51)	(-3.14)	(-2.14)	(-2.98)	(-2.82)	(-3.66)	(-3.69)	(-3.70)
$Ln(MW)_{t-1}$*$LaborInt_t$	**-0.022****	**-0.152*****						
	(-2.11)	**(-2.77)**						
$Ln(MW)_{t-1}$*FC_t			**-0.024*****	**-0.134*****				
			(-2.94)	**(-2.83)**				
$Ln(MW)_{t-1}$*$MarketPower_t$					**0.115*****	**0.587*****		
					(3.65)	**(3.78)**		
$Ln(MW)_{t-1}$* $TaxEnforce_t$							**0.006****	**0.017***
							(2.39)	**(1.67)**
$LaborInt_t$	0.235**	1.597***						
	(2.42)	(3.06)						
FC_t			0.248***	1.349***				
			(3.13)	(2.95)				
$MarketPower_t$					-1.219***	-6.148***		
					(-4.17)	(-4.36)		
$TaxEnforce_t$							-0.066***	-0.195*
							(-2.63)	(-1.95)
Control Variables	YES	YES	YES	YES	YES	YES	YES	YES
Firm fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Industry-year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Province-year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Obs. No.	14318	14047	17759	17427	17759	17427	17759	17427
Adj R^2	0.177	0.131	0.158	0.117	0.158	0.117	0.156	0.116

Table 7: Effect of the MW on domestic income shifting

This table reports results from OLS regressions relating the minimum wage and a specific tax strategy in China—income shifting. All variables are defined in Appendix A. The *t*-statistics, computed with robust standard errors clustered at the city level, are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
	Shifting (scaled by assets)	*Shifting (scaled by sales)*
$\boldsymbol{Ln(MW)_{t-1}}$	**0.223*****	**0.495****
	(3.05)	**(2.21)**
$GDPGR_t$	0.170*	0.056
	(1.89)	(0.25)
$Ln\text{GDP}_t$	-0.046	-0.482*
	(-0.69)	(-1.69)
SOE_t	0.019	0.079
	(1.04)	(1.00)
$Size_t$	0.011	-0.113***
	(1.38)	(-2.91)
BM_t	0.041***	0.192***
	(3.47)	(6.01)
$Ownership_t$	0.000	-0.001
	(0.18)	(-0.57)
ROA_t	0.990***	2.241***
	(8.99)	(6.97)
Lev_t	0.373***	1.160***
	(8.63)	(7.57)
Age_t	0.053***	0.159***
	(2.92)	(4.50)
PPE_t	-0.002	-0.066
	(-0.04)	(-0.41)
$Inventory_t$	-0.005	0.057
	(-0.44)	(1.07)
$Cash_t$	0.027	-0.014
	(0.89)	(-0.13)
Intercept	-2.494***	-2.041
	(-3.51)	(-0.80)
Firm fixed effects	YES	YES
Industry-year fixed effects	YES	YES
Province-year fixed effects	YES	YES
Obs. No.	17742	17742
Adj R^2	0.391	0.249

Table 8: Robustness checks

This table reports the results of robustness checks. Panel A reports the results after excluding sample firms with geographically dispersed operations. Panel B reports the results using alternative measures of tax planning outcomes. All variables are defined in Appendix A. The *t*-statistics, computed with robust standard errors clustered at the city level, are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Panel A: excluding geographically dispersed operations

	(1)	(2)
	$CETR_t$	$ModCETR_t$
$Ln(MW)_{t-1}$	**-0.117*** **	**-0.896*** **
	(-2.72)	**(-3.48)**
$GDPGR_t$	-0.003	0.246
	(-0.04)	(0.70)
$Ln\text{GDP}_t$	-0.036	-0.121
	(-1.17)	(-0.62)
SOE_t	-0.018	-0.090
	(-0.98)	(-1.11)
$Size_t$	-0.014**	-0.087***
	(-2.47)	(-3.04)
BM_t	0.006	0.056*
	(1.12)	(1.97)
$Ownership_t$	-0.000	-0.001
	(-0.47)	(-0.76)
ROA_t	-1.088***	-5.986***
	(-19.65)	(-20.31)
Lev_t	-0.028	-0.204
	(-1.10)	(-1.35)
Age_t	-0.013	-0.047
	(-1.33)	(-0.87)
PPE_t	-0.060**	-0.463***
	(-2.10)	(-2.75)
$Inventory_t$	0.049***	0.183***
	(4.90)	(3.30)
$Cash_t$	-0.010	-0.075
	(-0.50)	(-0.65)
Intercept	1.775***	12.235***
	(4.48)	(5.16)
Firm fixed effects	YES	YES
Industry-year fixed effects	YES	YES
Province-year fixed effects	YES	YES
Obs. No.	15753	15452
Adj R^2	0.155	0.114

Panel B: alternative measures of tax planning outcomes

	(1)	(2)
	$CETR3Yr_t$	$ModCETR3Yr_t$
$Ln(MW)_{t-1}$	**-0.081****	**-0.677*****
	(-2.37)	**(-3.90)**
$GDPGR_t$	-0.006	0.246
	(-0.14)	(1.02)
$Ln\text{GDP}_t$	-0.064**	-0.220
	(-2.20)	(-1.38)
SOE_t	0.001	0.041
	(0.10)	(0.59)
$Size_t$	0.012*	0.044
	(1.80)	(1.42)
BM_t	0.001	0.031*
	(0.30)	(1.93)
$Ownership_t$	0.000	-0.000
	(0.32)	(-0.17)
ROA_t	-0.469***	-2.430***
	(-10.51)	(-10.45)
Lev_t	-0.040**	-0.194**
	(-2.46)	(-1.97)
Age_t	0.002	0.043
	(0.23)	(0.94)
PPE_t	-0.060***	-0.476***
	(-2.90)	(-4.33)
$Inventory_t$	0.018***	0.058*
	(2.85)	(1.77)
$Cash_t$	0.008	0.020
	(0.53)	(0.24)
Intercept	0.881***	7.081***
	(2.81)	(4.00)
Firm fixed effects	YES	YES
Industry-year fixed effects	YES	YES
Province-year fixed effects	YES	YES
Obs. No.	15272	15025
Adj R^2	0.394	0.342

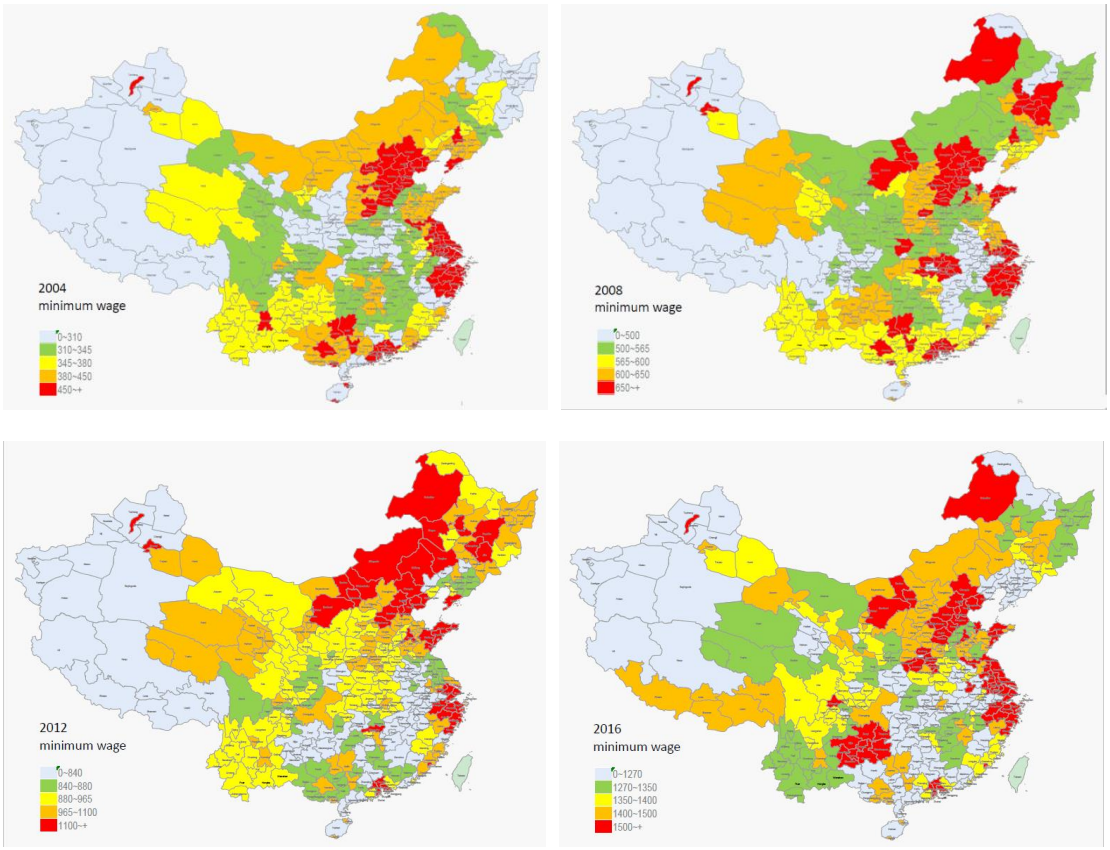

Fig. 1 Spatial distribution of minimum wages in China

This figure plots four diagrams for the distribution of city-level minimum wages in China, with each diagram representing a different sample year. In each diagram, we sort all Chinese cities into quintiles according to their minimum wages and assign each quintile a different color, with blue corresponding to the first quintile, green to the second quintile, yellow to the third quintile, orange to the fourth quintile, and red to the fifth quintile.