


Does corporate tax planning mitigate financial constraints? Evidence from China

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Abstract

We hypothesize that tax planning behaviour mitigates a firm's financial constraints, and this effect is more pronounced in non-state-owned enterprises and big firms compared to their counterparts. We use data for Chinese listed firms during the period 2010–2018 to test the hypotheses, based on both ordinary least squares and fixed-effect models. The regression results show that tax planning is positively and significantly associated with mitigation of financial constraints, suggesting that cash tax savings are likely to improve firms' financial slack. This effect is stronger for non-state-owned enterprises, big firms, non-political firms and firms in the eastern region of China. Further analyses reveal that, in the long run, tax planning increases firms' financial constraints, supporting Scholes-Wolfson's point of view of tax planning, that minimizing taxes is not the same as effective tax planning. These results are robust to various tests. Overall, our results suggest that minimizing tax generally produces immediate cash flow benefits and mitigates financial constraints in the short run; however, in the long run, firms should adopt sustainable financing strategies.

KEYWORDS

financial constraints, firm size, state-owned enterprises, tax planning

1 | INTRODUCTION

This paper investigates whether tax planning¹ behaviour helps to mitigate financial constraints. The theoretical and empirical financial literature provides various views on the effects of aggressive tax reporting, for example, aggressive tax reporting increases firm value (Edwards, Schwab, & Shevlin, 2016; Lim, 2011; Richardson, Lanis, & Taylor, 2015); greater tax avoidance exhibits higher costs of debt and stringent collateral security (Hasan, Hoi, Wu, & Zhang, 2014; Kubick & Lockhart, 2017). It has been found that other stakeholders view corporate tax planning as a source of finance in relation to capital management. Anecdotal evidence suggests that the implication of an inability to access external finance motivates

managers to focus on internally generated funds by decreasing firm expenses, since, compared to other cost-cutting techniques (e.g., reducing labour force, sale of unutilized assets), reducing tax liability has a less negative impact on costs of production and firm value (Edwards et al., 2016; Isin, 2018).

Studies that attempt to analyse tax planning and financial constraints, for example, Edwards et al. (2016), argue that financially constrained firms are motivated to engage in tax avoidance. Their argument is based on the principle that, when a firm is facing financial constraints, its credit ratings decrease, leading to an increase in the cost of debt and, in most cases, inability to access external finances (Richardson et al., 2015). Firms with a low credit rating may be viewed with suspicion of risk-shifting behaviour,

which leads to moral hazard,² consequently leading to an increase in debt capital costs and reduced access to debt capital (Zhang, Dong, Luo, & Segerstedt, 2014).

Contrarily, recent studies by Bayar, Huseynov, and Sardarli (2018) document that tax planning is associated with greater financial constraints when firms are plagued with principal-agency problems. In particular, Bayar et al. (2018) argue that the indirect costs associated with an opaque environment, such as the possibility of managers' diversification of resources for personal use, hoarding bad news about the firm and earnings manipulation render tax planning a costly process. The literature ignores the inherent presence of the principal-agency problem.

Although corporate tax planning literature indicates that financially constrained firms are motivated to engage in aggressive tax planning, little evidence exists to demonstrate whether corporate tax planning helps mitigate financial constraints. Accordingly, we attempt to expand and contribute to the existing tax literature by examining whether tax planning mitigates financial constraints. Specifically, we aim to address the question: Does corporate tax planning mitigate financial constraints?

We adopt a cost-effectiveness approach. We assert that, for firms considering whether to engage in tax planning activities, their intuition is that the continuum of tax planning revolves on the condition that the marginal benefits derived from engaging in tax planning outweigh the marginal costs of engaging in tax avoidance (Chen, Chen, Cheng, & Shevlin, 2010). We argue that constrained firms may be forced (pressure hypothesis) to reduce tax liability and eliminate potential bankruptcy costs and increase financial slack (Lim, 2011). While Edwards et al. (2016) highlight that cash tax savings contribute towards capital requirements, our study extends the literature and considers the overall level of firm constraints.

To examine the role of tax planning behaviour in mitigating a firm's financial constraints, we adopt multiple measures of financial constraints. We measure financial constraints using the WWscore (Whited & Wu, 2006) and the KZ index (Kaplan & Zingales, 1997). We use the cash-effective rate (CashEtr) as a proxy for corporate tax planning. Using Chinese listed firms, we first examine the effect of tax planning on the change in financial constraints. We anticipate that tax planning behaviour mitigates financial constraints in the short term.

China has implemented various tax reforms, including a tax reduction policy which was implemented in 2008 (Dang, Fang, & He, 2019). The tax policies implemented in China provide an excellent setting to examine whether tax planning mitigates financial constraints because China's tax policies resulted in a rising trend in tax revenue as a proportion of GDP. We construct a sample using annual data of A-Share companies

listed on China's Stock Market from 2010 to 2018. Consistent with our prediction, we find that corporate tax planning is positively associated with the mitigation of financial constraints but typically has short-term, rather than long-term effects. However, the reliance on internally generated funds (tax planning) to reduce financial constraints reflects the imperfections of capital markets (Bayar et al., 2018; Myers & Majluf, 1984).

Our study makes the following contribution to the literature. First, we provide additional evidence to the existing literature by examining the impact of tax planning on the mitigation of financial constraints. Unlike other literature, we examine the effects of tax planning on changes in financial constraints. Therefore, this study helps to enrich the theoretical analysis and empirical evidence on the economic consequences of corporate tax planning. Second, our paper thoroughly contemplates the potential influencing factors of tax planning on changes in financial constraints and relates the theories to finance. Hence, it helps widen the view on the influencing factors of mitigation of corporate financial constraints. Third, our paper provides some understanding of tax planning's economic benefits by dividing the sample into groups of state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs), big firms and small firms, and lightly constrained firms and highly constrained firms. It provides theoretical analysis and empirical support on how tax planning mitigates corporate financial constraints in different types of firms. Fourth, we provide evidence that regional inequality affects the use of tax planning as a financial constraint mitigation measure. Finally, we contribute to the literature by providing a clear understanding that tax planning is a temporary, short-term measure of mitigating financial constraints, usually 1 to 2 years, and at most 3 years. In terms of long-term effects, aggressive tax planning may even exacerbate corporate financial constraints.

The remainder of this paper is organized as follows: Section 2 discusses prior studies by literature review. Section 3 develops our hypotheses. Section 4 describes the sample data, the variables and the empirical models. Sections 5 and 6 focus on presentation of results for main and extension empirical research, respectively. Section 7 presents the discussion, and Section 8 concludes the remarks.

2 | LITERATURE REVIEW

In accounting and finance, taxation has been associated with financial information content, principal-agent relationship, corporate decisions, equity prices and chief executive officers' incentives (Chi, Huang, & Sanchez, 2017; Hanlon & Heitzman, 2010). The most common topic in

taxation is tax compliance. Various literature uses different terms to refer to the act of reducing final declared taxes; for example, tax avoidance (Bayar et al., 2018; Desai & Dharmapala, 2006), tax planning (Bradshaw, Liao, & Ma, 2019) and tax shelter (Graham & Tucker, 2006; Lisowsky, 2010; Wilson, 2009). In this study, we define tax planning as both legal and illegal carefully pondered actions to decrease a firm's tax liability.

2.1 | Approaches to tax planning

In their global tax planning framework, Scholes et al. (2015) argued that 'tax planning is a tax-favoured activity in that the tax planning costs are tax-deductible'. While it is arguably a significant managerial tool in increasing firm value, Scholes et al. (2015) document that tax minimization and effective tax planning are two different things. This implies that various approaches to tax tactics exist; hence, it is important to understand the consequences of firms' choice of tax strategies (Neuman, 2014). The Scholes–Wolfson paradigm suggests that when tax planning, 'the planner should consider the implications of a proposed transaction for all parties, consider all taxes and all costs involved'. The 'all parties' recommendation suggests that there are two or more parties in any transaction who are likely to influence the price of the transaction. The 'all taxes' expression was meant to highlight that not only explicit taxes may arise in a transaction or investment but also implicit taxes (Scholes et al., 2015). The final element in their approach is 'all costs', which was meant to highlight that in any tax planning decision, a planner should consider all costs involved in the planning process.

Tax planning generally involves reducing taxable income, increasing deductions and taking advantage of the tax credits. The first part of tax planning is the adjustable gross income. Adjusted gross income can be generally referred to as total gross income, minus specific deductions. Hence, the first approach to tax planning is a reduction of the adjusted gross income for a given taxable year. For example, a firm's interest income from treasury bonds creates tax exemptions, which reduces taxable income. The second approach to tax planning is to increase the amount of tax cost. In China, from January 1, 2018 to December 31, 2020, for newly acquired fixed assets with a unit value of less than 5 million yuan, Chinese revenue authorities allow such assets to be expensed-off in one lump sum in the year of purchase. This implies that the whole amount spent on an asset can be treated as an allowable deduction, which reduces the adjusted gross income of the year of purchase. This is known as accelerated depreciation.

Also, charitable donations, which are tax-deductible up to 12% of the annual accounting profit and any excess amount in the reporting year, can be carried forward and remain deductible in the next 3 years. By contrast, non-charitable donations are not tax-deductible. Therefore, firms that choose charitable donations, rather than non-charitable donations, can save taxes.

In tax planning, the final approach is to take advantage of tax credits. While tax credits do not reduce taxable income, they are subtracted directly from the tax debt. In China, apart from common examples of tax credits, such as medical expenses for workers, subscriptions, foreign tax credits, etc., there are other tax credits, such as industry-oriented tax credit, geography-based tax credit and investment tax credit. China income tax law exempts or reduces 50% of tax for any investment in agriculture, forestry, animal husbandry and fishery projects. As a tax planning technique, a non-agriculture firm may invest in the agriculture sector and use that investment as a vehicle for tax planning purposes. Sheven (2020) highlighted that, even if most tax literature ignores referencing Scholes and Wolf's framework, many of their determinants can be categorized as non-tax costs and implicit taxes, suggesting that the framework is in the background.

We follow (Liu & Li, 2017) and define financial constraints as the general hindrance of acquiring external capital. Financial constraints are associated with the risk of defaulting on contracts, which reduces the chances of accessing external finance. Financial difficulty is a condition in which a firm cannot make repayments on existing credit. While firms facing financial difficulties are more likely to default their debt covenants and in extreme cases become insolvent, Kaplan and Zingales (1997) classified 'firms as financially constrained if they face a wedge between internal and external costs of funds', suggesting that all firms are constrained. However, the degree of constraint level differs as the wedge between the internal and external cost increases (Kaplan & Zingales, 1997). Thus, the financial constraints are precise and objective impediments. In the absence of access to external finance, internal finance becomes the only available option for the managers to pursue.

Ponikvar et al. (2013) argued that firms facing tighter credit constraints are usually associated with severe information asymmetries. These firms rely more on internal financing compared to their counterparts which suffer less from asymmetrical information. Similarly, using Chinese firms, Dai, Shackelford, Zhang, and Chen (2013) find that firms with opaque information are associated with a higher cost of debt. This is generally caused by the reluctance of financial entities to grant credit to firms for which they do not have adequate information (Chen, Qu, Wongchoti, & Wu, 2020). The firm's ownership structure

can also be a determinant for financial constraints. Unlike non-state-owned firms, state-owned firms are associated with severe political interference that breeds rent-seeking and are likely to scare away lenders (Ponikvar, Kejžar, & Mörec, 2013). On the other hand, Bradshaw et al. (2019) indicate that centrally planned governments have better corporate governance which helps to reduce information asymmetries. Furthermore, firm size plays a significant role in the level of financial constraints; big, well-known firms are associated with the ability to carry out big, successful projects with huge profits. Consequently, this makes it easier and less costly to acquire external funds compared to small firms that usually do not have a performance history (Ponikvar et al., 2013).

3 | HYPOTHESIS DEVELOPMENT

3.1 | The effect of tax planning on the mitigation of financial constraints

In their study of family firms and non-family firms' tax aggressiveness, Chen et al. (2010) articulate that tax represents a substantial corporate expense. Therefore, during a phase of financial constraints, managers could be encouraged to engage in aggressive tax reporting to lower the final corporate tax payable to the tax authorities (Edwards et al., 2016; Richardson et al., 2015). The level of tax avoidance varies from firm to firm, depending on the degree of the manager's willingness to take more risk.

As for the benefits derived from tax planning, the decrease in final tax reduces the firm's expenses, which, in turn, increases the net profit and saves the firm's cash outflows. The reduction in cash outflow increases the cash holding level, which helps improve the firm's credit rating and mitigate its financial constraints. Prior studies (Bradshaw et al., 2019; Chen et al., 2010; Edwards et al., 2016; Law & Mills, 2015; Richardson et al., 2015; Slemrod, 2004; Wilson, 2009) indicate that cash saved by tax avoidance helps to improve firm value. Desai and Dharmapala (2006) postulate that corporate tax avoidance may serve as a source of finance once the shareholders' interests and the managers' interests are aligned together. When a firm is facing financial constraints, there is a possibility of managers and other personnel losing their jobs. In fact, managers associated with financial constraints may be perceived as being incompetent in the job market. Therefore, managers may strive to improve the financial situation of a firm to maintain their reputations. Thus, from this point of view, the interests of managers and the shareholders are aligned in preventing corporate financial constraints through tax planning.

The marginal costs associated with tax planning include direct costs (e.g., service fees charged by tax professionals, lawsuit costs, penalties imposed by the revenue authority if caught) and indirect costs (e.g., higher finance costs, reputational loss, fueling of principal-agent problems). For instance, aggressive tax reporting is associated with complex and undistinguishable business transactions, which need tax professionals to create such transactions. These professionals may charge exorbitant fees, which are the most common direct costs of tax planning. The direct costs of tax planning behaviour can be easily calculated by firm management, but the indirect costs may be neglected, which may lead to an inappropriate tax planning decision. For example, under the information hypothesis, Bayar et al. (2018) postulate that tax avoidance can increase the financial costs of a firm if the marginal costs of tax planning outweigh the marginal benefits that accrue to the firm as a result of engaging in aggressive tax reporting. Under the principal-agent framework, during a period of financial constraints, other managers may serve their self-centered interests and rent-seeking behaviour and use the opportunity to divert some portion of the tax to their advantage.

According to the cost-benefit principle, a corporate's equilibrium level of tax planning should be a point at which the marginal benefits derived from engaging in tax planning outweigh the marginal costs of engaging in tax avoidance (Chen et al., 2010; Edwards et al., 2016; Richardson et al., 2015). Therefore, most firms engage in aggressive tax planning after weighing the benefits and costs and expect to obtain positive net benefits (e.g., an increase in net profit or cash holding) in the near future. Following from the above analysis, we hypothesize that:

H1. Other things held constant, tax planning behaviour mitigates the firm's financial constraints.

3.2 | The moderating effect of ownership

From an ownership perspective, SOEs are enterprises in which the government has ultimate control and non-SOEs are classified as private firms. SOEs possess undisputed advantages compared to non-SOEs. Under China's economic model, which is a government-led growth model, the government owns the majority of the shares in many very large and important entities, in order to achieve economic growth and societal stability. The default link between SOEs and the government provides SOEs easy access to bank loans at very low-interest rates and less collateral compared to non-SOEs. On the other hand, non-SOEs have to satisfy the creditors first before earning the trust required to access loans with lower

interest rates. Additionally, non-SOEs have to prove the quality of financial information disclosure, absence of information asymmetry, good credit records and good tax records before they access external funding. Hence, we posit that the role of tax planning in mitigating financial constraints is limited in SOEs because they have more access to other external finance with low costs, but for non-SOEs, which are prone to financial constraints due to the absence of external finance, the expense and cash saved from tax planning may play a much more critical role in mitigating financial constraints.

Besides, Desai, Dyck, and Zingales (2007) posit that the major minority shareholder in companies is the state through its claim of taxes. Further, Bradshaw et al. (2019) postulate that 'taxes are implicit dividends to the controlling shareholders' in SOEs. Therefore, unlike non-SOEs, managers of SOEs have no reason to engage in aggressive tax reporting, since cash saved in tax avoidance practices will be dividends to the state which receives all taxes. More so, SOEs are perceived to be governed by bureaucrats whose ultimate goal is to achieve political strategies, rather than profit maximization (Bradshaw et al., 2019). Hence, the actions of SOEs embody moral standards and core values that create societal trust. Thus, when paying taxes, SOEs exhibit high effective tax rates compared to non-SOEs. In light of that, we posit that managers of SOEs have less motivation to utilize tax planning as an alternative channel of corporate finance, which inhibits the role of tax planning in mitigating financial constraints.

The above analysis leads to the following hypothesis:

- H2.** Other things held constant, the positive effect of tax planning on mitigation of financial constraints is more pronounced in non-SOEs than in SOEs.

3.3 | The moderating effect of firm size

Furthermore, we link the relationship between tax planning behaviour and the change in financial constraints with firm size.

Corporate tax avoidance has been linked to corporate size under two rival theories, that is, political cost theory and political power theory. Political cost theory suggests that big firms have more corporate social responsibility, and their corporate conduct is adjusted to what the society expects (Watts & Zimmerman, 1986, pp. 3–9). Zimmerman (1983) hypothesizes that firm size is positively linked to a firm's effective tax rate under the political cost hypothesis. Under this hypothesis, bigger firms ordinarily engage in less tax planning behaviour; however, the role of tax planning in mitigating financial constraints is even more pronounced, because bigger firms

have much more room for tax planning when they face difficulty in accessing external finance.

Under political power theory, Siegfried (1972) postulates that big firms have a degree of control over political processes in their favour. Big firms may negotiate taxes and lobby for policies favourable to themselves. The political power possessed by bigger firms can amplify the effect of tax planning on mitigating financial constraints because bigger firms have more capability to optimize their tax planning decision to gain more benefits at lower costs. Hence, although political cost theory and political power theory posit opposite relationships between firm size and tax planning behaviour, they both support that bigger firm size can amplify the role of tax planning in mitigating financial constraints. This point of view motivates us to hypothesize that:

- H3.** Other things being held constant, the positive effect of tax planning on mitigation of financial constraints is more pronounced in big firms than in small firms.

4 | DATA, VARIABLES AND RESEARCH DESIGN

4.1 | Data

The data used in this study are obtained from the China Security Market and Accounting Research (CSMAR) database. We obtained annual financial statements of A-share listed companies, covering the period of 2010–2018. China implemented the new Enterprise Income Tax Law on January 1, 2008, and the corporate income tax rate changed from 33 to 25%. Hence, the data before 2008 are excluded. Also, in consideration of the widespread impact of the global financial crisis during 2007–2009 and the global economic depression caused by the COVID-19 pandemic during 2019–2020, we set the study period as 2010–2018. Although there was also a crisis in 2012, its intensity was not as great as that of 2007–2009. Hence, we use the study period of 2010–2018 to produce sufficient data for the main regressions and delete the year 2012 from our data for a robustness check. Consistent with prior tax planning studies (e.g., Desai & Dharmapala, 2006; Edwards et al., 2016; Lim, 2011; Wilson, 2009), we eliminate firm-year observations with negative pretax income and missing data for relevant variables. Because financial difficulty is not equivalent to financial constraint, we distinguish firms facing financial difficulties from those facing financial constraints. In 1998, the China Securities Regulatory Commission introduced a regulation that led to the treatment of firms facing financial difficulties and shrinkage of equity as Special Treatment (ST) firms. Using this regulation, we remove all ST firms from our sample.

We also eliminate all firms in the financial sector. After factoring all the exclusions, our final sample consists of 11,826 firm-year observations.

4.2 | Change in financial constraints

Since we seek to investigate the impact of tax planning behaviour on the change in financial constraints, we therefore calculate our dependent variables as the change (Δ) in a firm's financial constraints (WWscore and KZ score) from year $t-1$ to year t . Prior literature (e.g., Altman, 1983; Ohlson, 1980; Whited & Wu, 2006; Zmijewski, 1984) utilized various models to gauge the financial constraints and bankruptcy level of firms. In this study, we use Whited and Wu's WWscore (2006) and the KZ index (Kaplan & Zingales, 1997), financial constraint diagnosis models, as proxies for financial constraints. Financial constraint measures are coded such that higher values signal greater financial constraints.

4.3 | Tax planning

Due to the unavailability of corporate final tax assessment returns, the actual values of final declared taxes by tax commissioners are not known. Therefore, we follow prior literature (Beladi, Chao, & Hu, 2018; Chen, Cheok, & Rasiah, 2016; Graham & Tucker, 2006) and measure tax planning using proxies. We use CashEtr as a proxy measure of tax planning. CashEtr is measured as the ratio of cash taxes paid to pretax income, adjusted for special items. We posit that firms exhibiting lower (higher) CashEtr are associated with higher (lower) tax planning.³ CashEtr is lagged so as to allow more time for tax planning implementation, and this also alleviates, to some extent, the possible reverse causality problem.

4.4 | Control variables

Based on prior empirical studies, we include several control variables in our regression model, such as cost of debt scaled by total liabilities (COD); leverage (Lev); research and development (Research and Dev); property, plant and equipment, scaled by total assets (PPE); firm sales growth (Firm Sales Growth); discretionary accruals (Discretionary ACC); intangible assets, scaled by total assets (Intangible); cash and cash equivalents, scaled by total assets (Cash); absolute discretionary accruals (Abs Disc ACC); industry sales growth (Ind Sales Growth) and return on assets (ROA). We also include variable SOE to distinguish between SOEs and non-SOEs. We include variable

Political to control for politically connected firms and firms with no political connections. We use variable Location to distinguish the firm's geographic location and finally include the total annual tax collected by the government scaled by GDP (Tax_GDP) to control for macro fiscal policy.

The definitions of the variables are in Table 1.

Tax credits and deductions may not be connected with the firm's level of production. Thus, the firm can change production levels without changing fixed assets. Such a change in production does not change the depreciation tax deductions. This is called a fixed tax shield effect (Edwards et al., 2016). Therefore, we use property plant and equipment scaled by total assets (PPE) to control for debt tax shields.

We use industry sales growth (Ind Sales Growth) to measure the increase in economic activity in the industry and control for macroeconomic constraints. Article 6 of the Chinese tax law permits deductions of debt interest costs; thus, the law allows deductions related to capital costs. Consequently, we use leverage (Lev) to control for tax shields. According to Ghazali, Shafie, and Sanusi (2015), financial information of an entity should reflect the correct position of a firm. However, due to the difficulties of raising funds on capital markets, firms have a tendency to present financial information favourable to the firm so as to attract investors. This tendency is known as earnings management. On the other hand, when submitting financial statements to the revenue authorities for income tax purposes, such firms present unfavourable financial information so that they pay as little income tax as possible. We, therefore, use Jones (1991) as a proxy for discretionary accruals (Discretionary ACC) and absolute discretionary accruals (Abs Disc ACC). Governments use fiscal policies to control macroeconomic conditions, which are meant to adjust the macroeconomic conditions of a nation, and their effects have certain impact on firms' final declared taxes. Therefore, we use the total annual tax collected by the government scaled by GDP (Tax_GDP) to control for macro fiscal policy.

4.5 | Empirical models

We set our model as:

$$\Delta FC_{it} = \beta_0 + \beta_1 \text{CashEtr}_{it-1} + \beta_2 \Delta \text{Controls}_{it} + \text{Year} + \text{Industry} + \varepsilon \quad (1)$$

where, i denotes firms and t denotes years; ΔFC is the dependent variable representing the change in financial constraints from year $t-1$ to year t ; CashEtr is the independent variable; $\Delta \text{Controls}$ refers to the change in all

TABLE 1 Definition of variables

Variables	Description
WWscore	WWscore, a financial constraint measure designed by Whited and Wu (2006)
KZ Score	KZ score, a financial constraint measure designed by Kaplan and Zingales (1997)
CashEtr	Ratio cash taxes paid to pretax income adjusted for special items
COD	Cost of debt finance expenses scaled by total liabilities
Lev	Leverage (total debt scaled by total assets)
Research and Dev	Research and development scaled by total assets
PPE	Property plant and equipment scaled by total assets
Firm Sales Growth	Firm sales growth
Discretionary ACC	Discretionary accruals (Jones, 1991)
Intangible	Assets scaled by total assets
Cash	Cash and cash equivalent scaled by total assets
Abs Disc ACC	Absolute discretionary accruals
Ind Sales Growth	Industry sales growth
ROA	Return on Assets (earnings before interest, tax and depreciation scaled by total assets)
SOE	Returns the value of 1 if a firm is state-owned, otherwise 0
Size	Natural log of firm total assets
Political	Returns the value of 1 if a firm is owned, otherwise 0
Location	Returns the value of 1 if the firm is a non-eastern region and 0 for the eastern region
Tax_GDP	Total annual tax collected by government scaled by annual GDP

control variables from year $t - 1$ to year t ; Year and Industry refer to time and industry fixed effects, respectively. ε is the residual of the formula; in our main model, the coefficient of focus is β_1 .

5 | EMPIRICAL RESULTS

5.1 | Descriptive statistics

In Table 2, we provide a summary of descriptive statistics for variables used in this study. All continuous

variables are winsorized at 1 and 99% of their distribution to minimize the influence of outliers. Our dependent variables, Δ WWscore score and Δ KZscore, have a mean of -0.056 and -0.27 , respectively. The mean and median value of our independent variable (L.CashEtr) are 0.18 and 0.16, respectively. This shows that tax planning exists.

5.2 | The effect of corporate tax planning on changes in financial constraints

To provide an understanding of the effect of tax planning on the change in financial constraints, we present our regression results using multivariate analysis. The dependent variables are Δ WWscore and Δ KZscore, and the independent variable is L.CashEtr. Higher (lower) Δ WWscore or Δ KZscore is associated with greater (lower) financial constraints. Higher (lower) CashEtr indicates lower (greater) tax planning. Table 3 shows our baseline regression results from estimating Equation (1), using both ordinary least squares (OLS) and fixed effects (FE) to capture the unobserved heterogeneity that is time-invariant across firms.

Our regression results, both OLS and FE, show that the coefficients for tax planning measures are positive and statistically significant for both Δ WWscore and Δ KZscore, statistically significant at the level of 1% for Δ WWscore and at the level of 5% for Δ KZscore. Considering that an increase in CashEtr suggests more cash taxes paid and an increase in both WWscore and KZscore suggests a greater financial constraint, our regression results suggest that the higher (lower) amount of cash taxes paid by the firm as a percentage of its taxable income, the greater (lower) the magnitude of its financial constraints.

Consistent with H1, these findings suggest that tax planning is a tool for generating internal funds, which helps mitigate corporate financial constraints. Accordingly, the more tax planning behaviour, the more mitigation of financial constraints in the following year. Our results are economically significant. For instance, the coefficient of L.CashEtr in column (1) is 0.168, indicating that, on average, the lower amount of cash taxes paid by the firm as a percentage of its taxable income, the greater the mitigation of financial constraints, by 0.168 which is about 30.8%. Similarly, in column (4), the coefficient of CashEtr 0.450 indicates that, on average, tax planning reduces financial constraints by 0.450 which is about 18.33%. These results are consistent with the argument that, when faced with limited options, manager's resort to tax planning to meet financial needs and mitigate financial constraints.

Variable	Number	<i>M</i>	<i>SD</i>	P25	Median	P75
Δ WWscore	11,826	-0.06	0.37	-0.27	-0.05	0.15
Δ KZscore	11,826	-0.27	1.38	-0.85	-0.15	0.46
L.CashEtr	11,826	0.18	0.11	0.10	0.16	0.25
Δ COD	11,826	-0.02	0.07	-0.05	-0.01	0.02
Δ Lev	11,826	0.08	0.81	-0.11	0.02	0.21
Δ Research and Dev	11,826	0.00	0.01	-0.01	0.00	0.01
Δ PPE	11,826	0.00	0.04	-0.03	-0.01	0.02
Δ Firm Sales Growth	11,826	-0.01	0.34	-0.18	-0.01	0.17
Δ Intangible	11,826	0.00	0.01	-0.01	0.00	0.00
Δ Cash	11,826	0.00	0.11	-0.05	0.01	0.06
Δ Abs Disc ACC	11,826	-0.02	0.18	-0.10	-0.01	0.07
Δ Ind Sales Growth	11,826	0.00	0.28	-0.13	0.01	0.14
Δ ROA	11,826	0.00	0.03	-0.02	0.00	0.01
SOE	11,826	0.57	0.50	0.00	1.00	1.00
Δ Size	11,826	0.16	0.20	0.04	0.11	0.22
Pol	11,826	0.53	0.50	0.00	1.00	1.00
Location	11,826	0.39	0.49	0.00	0.00	1.00
Tax_GDP	11,826	0.18	0.00	0.18	0.18	0.19

TABLE 2 Descriptive statistics

Note: All variables are defined in Table 1.

5.3 | Robustness check

5.3.1 | Re-measure of financial constraint and tax planning

In our main model, we use Δ WWscore score and Δ KZscore as dependent variables that measure the changes in financial constraints and CashEtr as an explanatory variable that captures tax planning behaviour. To verify the robustness of the above regression results, we begin by employing alternative measures of financial constraints and tax planning. We first employ Z-China score constructed by Zhang, Altman, and Yen (2010) as an alternative proxy measure for financial constraints. A higher (lower) ZChina score means lower (greater) financial constraints. Therefore, the Δ ZChina score also equals its value of year t minus its value of year $t - 1$, and a larger Δ ZChina score means greater mitigation of financial constraints.

We also add other tax planning proxies to measure corporate tax planning. Specifically, we use Desai and Dharmapala's (2006) book-tax differences (DD_BT D) model and Wilson's (2009) tax shelter model to capture tax planning. A higher (lower) DD_BT D or tax shelter means more (less) aggressive tax planning.

Table 4 presents the regression results of tax planning and the changes in financial constraints when the dependent or independent variable is replaced with the

alternatives. We find positive significant coefficients for both tax planning measures at the level of 1% on Δ Z-China score. These findings support H1 and are consistent with the findings of our main regression results and show that our results are robust to other proxy measures of tax planning and financial constraints.

5.3.2 | Robustness using direct measures of financial constraints

We argue that, if financial constraints are signaled by the inability to access debt capital and high cost of loan due to decrease in credit ratings (Ayers, Laplante, & McGuire, 2010; Edwards et al., 2016), it is plausible to use loan cost (Loan cost) and loan structure as direct measures for financial constraints. We follow Beladi et al. (2018) and measure loan cost as the interest expense on loan scaled by total amount of a loan and measure loan structure as the total amount of loan facility obtained by a firm scaled by total liabilities.

Table 5 presents our regression results using direct measures of financial constraints. In column (1), we find a positive significant coefficient for CashEtr at the level of 1%. This suggests that the higher (lower) the CashEtr, the higher (lower) the loan cost. In column (2), we find a negative significant coefficient for CashEtr at the level of 1%. Our results suggest that tax planning is associated

TABLE 3 Corporate tax planning and the change in financial constraints

	(1) OLS Δ WWscore	(2) Δ KZscore	(3) FE Δ WWscore	(4) Δ KZscore
L.CashEtr	0.168*** (5.52)	0.299** (2.52)	0.247*** (4.01)	0.450** (2.00)
Δ COD	1.991*** (27.17)	9.913*** (31.07)	1.924*** (21.44)	9.238*** (24.36)
Δ Lev	-0.057*** (-13.55)	-0.101*** (-7.10)	-0.051*** (-11.14)	-0.086*** (-5.50)
Δ Research and Dev	3.371*** (9.82)	10.749*** (8.20)	3.430*** (9.32)	11.376*** (8.12)
Δ PPE	0.386*** (4.30)	-1.468*** (-4.65)	0.431*** (4.25)	-1.210*** (-3.41)
Δ Firm Sales Growth	-0.134*** (-11.97)	-0.459*** (-11.27)	-0.136*** (-11.37)	-0.458*** (-10.72)
Δ Intangible	0.796** (2.39)	-6.113*** (-5.12)	0.817** (2.18)	-5.813*** (-4.29)
Δ Cash	-0.830*** (-20.33)	-2.965*** (-15.94)	-0.764*** (-16.03)	-2.575*** (-12.08)
Δ Abs Disc ACC	0.071*** (3.19)	0.384*** (5.00)	0.056** (2.39)	0.337*** (4.12)
Δ Ind Sales Growth	0.005 (0.43)	-0.011 (-0.25)	0.004 (0.34)	-0.014 (-0.29)
Δ ROA	4.081*** (23.79)	10.699*** (15.53)	4.463*** (22.78)	11.544*** (14.72)
SOE	-0.045*** (-3.27)	-0.214*** (-4.54)	-0.154 (-1.18)	-0.170 (-0.91)
Size	-0.019*** (-2.75)	0.032 (1.41)	-0.014 (-0.89)	-0.008 (-0.15)
Pol	-0.000 (-0.02)	-0.027 (-0.50)	0.027 (0.15)	0.073 (0.16)
Location	0.021** (2.32)	0.108*** (2.90)	0.096 (0.74)	0.090 (0.21)
Tax_GDP	1.211 (0.28)	61.509*** (4.19)	-6.573 (-1.36)	31.253** (1.99)
_cons	-0.207 (-0.27)	-10.695*** (-4.12)	1.190 (1.36)	-5.130* (-1.83)
Firm-fixed	No	No	Yes	Yes
Year-fixed	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes
<i>N</i>	11,826	11,826	11,826	11,826
Adj. <i>R</i> ²	.217	.254	.205	.209
<i>r</i> ²	.223	.260	.211	.215

Note: Bold values represent the values of the variable of interest. Huber–White robust standard errors clustered by firm are used to control for heteroscedasticity and serial correlation.

*Significant at 10% level.

**Significant at 5% level.

***Significant at 1% level.

with high interest premiums (Isin, 2018). However, the negative coefficient in column (2) suggests that the lower the cash effective rate a firm pays, the higher the firm's loan structure. This finding is consistent with the argument of Lim (2011) that the use of tax avoidance increases financial slack, which enhances the credit ratings and reduces the default risk. This increases the firm's access to debt. These results support the notion that tax planning reduces financial constraints.

5.3.3 | Robustness using ranked tax planning

To further check the robustness of the main regression results, we rank our lagged CashEtr variable from the 1st to 10th decile, where the 1st decile represents high tax

planning and the 10th decile represents low tax planning. Secondly, we run regressions to obtain coefficients of ranked CashEtr on financial constraints measures. Table 6 shows the regression results of using ranked lagged CashEtr as an independent variable. Using ranked CashEtr, our regression results show that the coefficients of ranked CashEtr on Δ WWscore and Δ KZscore are significantly positive at the level of 1 and 5%, respectively, which also supports that tax planning mitigates financial constraints and further verifies the robustness of the main regression results.

5.3.4 | Further robustness check after deleting year 2012 from the data

Although the 2012 financial crisis was not as devastating as the 2007–2009 financial crisis, it also had a certain

TABLE 4 Robustness check re-measure of tax planning and financial constraints

	(1) ΔZ_{China} score	(2) ΔZ_{China} score
L.DD_BTD	0.117*** (10.19)	
L.Tax shelter		0.011*** (6.00)
_cons	−0.856*** (−3.76)	−0.926*** (−4.03)
Control variables	Yes	Yes
Year-fixed	Yes	Yes
Industry-fixed	Yes	Yes
N	11,806	11,806
Adj. R^2	.795	.793
r^2	.797	.794

Note: Bold values represent the values of the variable of interest. For brevity, only tax planning coefficients are reported. Huber–White robust standard errors clustered by firm are used to control for heteroscedasticity and serial correlation.

***Significant at 1% level.

TABLE 5 Further robustness checks using direct measures of financial constraints

	(1) Loan cost	(2) Loan structure
L.CashEtr	0.070*** (14.17)	−0.561*** (−8.86)
_cons	−0.542*** (−3.47)	−3.459** (−2.14)
Controls variables	Yes	Yes
Year-fixed	Yes	Yes
Industry-fixed	Yes	Yes
N	11,826	11,826
Adj. R^2	.690	.216
r^2	.693	.222

Note: Bold values represent the values of the variable of interest. For brevity, only tax planning coefficients are reported. Huber–White robust standard errors clustered by firm are used to control for heteroscedasticity and serial correlation.

**Significant at 5% level.

***Significant at 1% level.

degree of effect on both banking and non-banking firms. The study by Kahle and Stulz (2013) shows that, during financial crises, cash holdings, capital expenditure and corporate borrowing decline severely. Consequently, firms are anticipated to exhibit increased tax planning during financial crises (Richardson et al., 2015). Therefore, to eliminate the noise caused by the 2012 global financial crisis, we delete year 2012 from our sample for a further robustness check.

Table 7 presents the regression results of tax planning and the changes in financial constraints after deleting year 2012 from the sample. Our regression results, both OLS and fixed effects show that the coefficients for tax

TABLE 6 Robustness check using ranked tax planning

	(1) ΔWW score	(2) ΔKZ score
Ranked L.CashEtr (1–10)	0.006*** (5.39)	0.009** (2.10)
_cons	−0.572 (−0.76)	−11.548*** (−4.43)
Control variables	Yes	Yes
Year-fixed	Yes	Yes
Industry-fixed	Yes	Yes
N	11,826	11,826
Adj. R^2	.216	.250
r^2	.222	.256

Note: Bold values represent the values of the variable of interest. For brevity, only tax planning coefficients are reported. Huber–White robust standard errors clustered by firm are used to control for heteroscedasticity and serial correlation.

**Significant at 5% level.

***Significant at 1% level.

planning measures are positive and statistically significant for both ΔWW score and ΔKZ score, statistically significant at the level of 1% for ΔWW score and at the level of 5 and 10% for ΔKZ score. These results show that the 2012 global financial crisis had no significant impact on Chinese firms' tax planning.

5.4 | The role of firm ownership in the relationship between corporate tax planning and the change in financial constraints

Table 8 reports regression results of the role of ownership on the relationship between corporate tax planning and the changes in financial constraints. We posit that the marginal influence of tax planning on financial constraints varies depending on ownership. We distinguish firms as SOEs or non-SOEs. Our regression results show that, for non-SOEs, the coefficients of tax planning measures are positive and statistically significant at the 1% level for both ΔWW score and ΔKZ score. For SOEs, the regression results show that the coefficient of tax planning is statistically significant at 10% for ΔWW score and not statistically significant for ΔKZ score. At the same time, the coefficients of L.CashEtr for the group of non-SOEs are much larger than those for the group of SOEs. Therefore, our results indicate that ownership has a significant role in the association between corporate tax planning and changes in financial constraints. Overall, our results suggest that the positive relationship between corporate tax planning and the mitigation of financial

TABLE 7 Further robustness check after deleting year 2012 from the data

	(1)	(2)	(3)	(4)
	OLS		FE	
	Δ WWscore	Δ KZscore	Δ WWscore	Δ KZscore
L.CashEtr	0.169*** (5.16)	0.297** (2.36)	0.261*** (4.03)	0.457* (1.94)
_cons	-0.073 (-0.09)	-10.234*** (-3.90)	1.246 (1.38)	-5.018* (-1.74)
Control variables	Yes	Yes	Yes	Yes
Year-fixed	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes
<i>N</i>	10,280	10,280	10,280	10,280
Adj. R^2	.204	.236	.194	.198
r^2	.211	.243	.201	.205

Note: Bold values represent the values of the variable of interest. For brevity, only tax planning coefficients are reported. Huber–White robust standard errors clustered by firm are used to control for heteroscedasticity and serial correlation.

*Significant at 10% level.

**Significant at 5% level.

***Significant at 1% level.

TABLE 8 The role of ownership in the relationship between corporate tax planning and the change in financial constraints

	State-owned		Non-state owned	
	(1)	(2)	(3)	(4)
	Δ WWscore	Δ KZscore	Δ WWscore	Δ KZscore
L.CashEtr	0.076* (1.93)	0.226 (1.31)	0.291*** (6.09)	0.443*** (3.18)
_cons	-2.626** (-2.15)	-19.502*** (-4.34)	1.622* (1.76)	-2.739 (-0.98)
Control variables	Yes	Yes	Yes	Yes
Year-fixed	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes
<i>N</i>	6,725	6,725	5,101	5,101
Adj. R^2	.216	.252	.219	.230
r^2	.226	.262	.233	.243

Note: Bold values represent the values of the variable of interest. For brevity, only tax planning coefficients are reported. Huber–White robust standard errors clustered by firm are used to control for heteroscedasticity and serial correlation.

*Significant at 10% level.

**Significant at 5% level.

***Significant at 1% level.

constraints is more pronounced in the group of non-SOEs than in the group of SOEs. These results support our second hypothesis, H2.

5.5 | The role of firm size on the effect of corporate tax planning on the change in financial constraints

Next, we examine the role of firm size in the relationship between corporate tax planning and the change in financial constraints. We divide our sample into two

groups of big or small firms, using the median value of the variable firm size. In Table 9, we report our regression results for both big and small firms. Our regression results show that, among big firms, the coefficients for tax planning measures are positive and statistically significant at the 1% level and the 5% level for Δ WWscore and Δ KZscore, respectively. Among small firms, the regression results show that the coefficient of tax planning is statistically significant only at 5% for Δ WWscore and not statistically significant for Δ KZscore. At the same time, the coefficients of L.CashEtr for the group of big firms are much larger than those for the group

TABLE 9 The role of firm size in the relationship between corporate tax planning and the change in financial constraints

	Big firms		Small firms	
	(1) Δ WWscore	(2) Δ KZscore	(3) Δ WWscore	(4) Δ KZscore
L.CashEtr	0.216*** (4.89)	0.344** (2.46)	0.083** (2.00)	0.072 (0.39)
_cons	1.798* (1.76)	-10.041*** (-3.53)	-3.170** (-2.71)	-14.362** (-3.00)
Control variables	Yes	Yes	Yes	Yes
Year-fixed	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes
N	5,913	5,913	5,913	5,913
Adj. R^2	.219	.255	.215	.248
r^2	.231	.266	.227	.260

Note: Bold values represent the values of the variable of interest. For brevity, only tax planning coefficients are reported. Huber-White robust standard errors clustered by firm are used to control for heteroscedasticity and serial correlation.

*Significant at 10% level.

**Significant at 5% level.

***Significant at 1% level.

TABLE 10 Endogeneity test. For brevity, only tax planning coefficients are reported

	(1) First stage L.CashEtr	(2) First stage L.CashEtr	(3) First stage Δ WWscore	(4) Second stage Δ WWscore	(5) Second stage Δ KZscore
Loss_CF	-0.094*** (-5.58)				
IM_CashEtr		0.807*** (44.38)			
Tobin			-0.041*** (-2.88)		
L.CashEtr				0.137* (1.80)	0.654** (2.19)
_cons	0.179*** (4.56)	.138*** (3.77)	-0.364*** (-2.98)	0.250** (2.07)	-2.373*** (-4.99)
Controls variables	Yes	Yes	Yes	Yes	Yes
N	11,826	11,826	11,826	11,826	11,826
Adj. R^2	.114	.238	.210	.198	.131
r^2	.115	.239	.211	.198	.132
Durban score				0.023	0.000
Wald test, F statistic				1,018.8	1,018.8
Basman				0.2316	0.2910

Note: Bold values represent the values of the variable of interest. Huber-White robust standard errors clustered by firm are used to control for heteroscedasticity and serial correlation.

*Significant at 5% level.

**Significant at 10% level.

***Significant at 1% level.

of small firms. Therefore, our overall results show that the role of tax planning in mitigating financial constraints is more pronounced in big firms compared to small firms, supporting our hypothesis, H3. Consistent with theoretical analysis, our findings suggest that the greater the firm size, the more room and capability the company has to utilize tax planning as a tool to mitigate its financial constraints.

5.6 | Endogenous test

The causality between tax planning behaviour and financial constraints may operate in a reverse direction. Also, because of the potential endogeneity caused by the nature of our data, heteroscedasticity and omission of variables, we lag the independent variable of tax planning for 1 year to alleviate the possible reverse causality

TABLE 11 The role of political connectedness

	Political		Non-political	
	(1) Δ WWscore	(2) Δ KZscore	(3) Δ WWscore	(4) Δ KZscore
L.CahEtr	0.064 (1.59)	0.224 (1.24)	0.272*** (5.88)	0.368*** (2.67)
_cons	-2.110* (-1.68)	19.055*** (-4.12)	0.947 (1.03)	-4.186 (1.48)
Control variables	Yes	Yes	Yes	Yes
Year-fixed	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes
<i>N</i>	6,237	6,237	5,589	5,589
Adj. R^2	.209	.246	.226	.249
r^2	.221	.257	.239	.261

Note: Bold values represent the values of the variable of interest. For brevity, only tax planning coefficients are reported. Huber–White robust standard errors clustered by firm are used to control for heteroscedasticity and serial correlation.

*Significant at 10% level.

***Significant at 1% level.

problem to some extent. We also consider that a mere OLS approach of examining if tax planning mitigates financial constraints may be biased, therefore, we consider the 2SLS approach based on an instrument variable to attenuate the possibility of endogeneity towards the estimator CashEtr.

We use loss carried forward, the industry median value of tax planning measure and Tobin as instrument variables for 2SLS methodology. We argue that losses carried forward from previous years can directly reduce CashEtr in the current fiscal year (tax shield) but does not directly impact the current financial situation. We use the industry median value of CashEtr (IM_Cash Etr) as our instrument for tax planning. Intuitively, it is likely that peer pressure makes firms follow the industry norms. We argue that firms with better asset valuation are less likely to face financial difficulties and Tobin can only affect tax planning through financial constraints. The results of the 2SLS approach are shown in Table 10. The results of our first-stage regression, columns (1) to (3), justify the use of our tax planning and financial constraint instruments. The regression results of second-stage regression, columns (4) and (5), show that the coefficients for tax planning measures are positive for both Δ WWscore and Δ KZscore and statistically significant. The coefficients are significant at the level of 10% for Δ WWscore and at the level of 5% for Δ KZscore. Consistent with H1, these findings suggest that tax planning plays a positive role in generating internal funds to mitigate financial constraints. Thus, the more aggressive the tax reporting, the more the mitigation of financial constraints. These results supplement our conclusion and clearly entail that our findings are robust.

6 | EXTENSION

6.1 | The role of firm political connectedness

The effect of tax planning on financial constraints might be influenced by the political connections of a firm. Politically connected firms often have easy access to capital because of their proximity to political elites, who have influence in most financial institutions (Tee, 2018). Therefore, it is plausible to argue that politically connected firms may have no motive to practice tax planning activities. We test whether tax planning is related to political connectedness. In Table 11, we report the regression results of the role of political connectedness. In columns (1) and (2), the coefficients of CashEtr are positive but not statistically significant. In columns (3) and (4), the coefficients of CashEtr are positive and statistically significant at the level of 1%. These results suggest that the positive relationship between tax planning and mitigation of financial constraints is pronounced only among non-politically connected firms, possibly because their proximity to political elites makes politically connected firms less likely to face difficulties in accessing external finance.

6.2 | The role of the firm's geographical location

Apart from the characteristics of a firm, we posit that the effect of tax planning on mitigating financial constraints might be related to the geographical location of a firm.

TABLE 12 The role of geographical location

	Eastern region		Non-eastern region	
	(1) Δ WWscore	(2) Δ KZscore	(3) Δ WWscore	(4) Δ KZscore
L.CahEtr	0.229*** (5.69)	0.285** (1.97)	0.057 (1.24)	0.257 (1.31)
_cons	0.811 (0.92)	-5.697** (-1.99)	-2.465* (-1.77)	-18.808*** (-3.73)
Control variables	Yes	Yes	Yes	Yes
Year-fixed	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes
N	7,161	7,161	4,665	4,665
Adj. R^2	.222	.259	.215	.246
r^2	.232	.269	.230	.261

Note: Bold values represent the values of the variable of interest. Huber-White robust standard errors clustered by firm are used to control for heteroscedasticity and serial correlation.

*Significant at 10% level.

**Significant at 5% level.

***Significant at 1% level.

Unlike the rest of the country, the eastern region of China is well developed and the government has a large tax base. The tax collection intensity, however, is relatively low. In the non-eastern region, growth is relatively slow and tax collection is intense. Therefore, we posit that geographical location affects tax planning. We divide our data into two subsamples using the firm's location. We show the results in Table 12. In columns (1) and (2), the eastern region, the coefficients of tax planning are positive and statistically significant at the 1 and 5% levels, respectively. Under the non-eastern region, columns (3) and (4), the regression results are positive but not statistically significant. The results suggest that, for firms in the eastern region, tax planning mitigates financial constraints and, for firms in the non-eastern region, tax planning does not affect financial constraints.

6.3 | The existing levels of financial constraints

In this subsection, we argue that the relationship between corporate tax planning and the change in financial constraints varies across the existing levels of financial constraints. Specifically, we try to explore whether the positive impact of tax planning on mitigating financial constraints is concentrated among firms with a high or low level of financial constraints. We adjudge that it is paramount to pronounce the association between corporate tax planning and changes in financial constraints in a tale of a high and low level of financial constraints because firms experiencing different levels of financial constraints may acquire tax planning funds at different

marginal costs. Since (OLS) estimation approach ignores anything beyond a shift in a central location (i.e., the conditional mean), we therefore split our full sample into highly constrained firms and low-constrained firms according to the median value of WWscore or Zscore of year $t - 1$. Table 13 reports the regression results for both groups.

Within the group of low-constrained firms, we find positive and significant coefficients of L.CashEtr, statistically significant at 1% level for both Δ WWscore and Δ KZscore. On the contrary, within the group of highly constrained firms, we find negative and significant coefficients of L.CashEtr, statistically significant at the 1% level for both Δ WWscore and Δ KZscore. The results suggest that the positive impact of tax planning on the mitigation of financial constraints only exists among low-constrained firms. For highly constrained firms, more tax planning even inhibits mitigation of financial constraints.

These findings are consistent with the claim that the marginal costs of tax planning are much higher for highly constrained firms than for low-constrained firms. Highly constrained firms have to bear more indirect costs for tax planning because of higher finance costs, reputational loss and agent costs. For example, creditors and investors usually pay more attention to highly constrained firms and are likely to view aggressive tax reporting as a sign of managerial problems and greater risks of moral hazard, rent-seeking, earnings manipulation and other managerial incentive problems; as a result, they will require a higher return on their funds.

In addition, existing literature documents that firms increase tax planning when facing increasing financial constraints (Edwards et al., 2016; Law & Mills, 2015).

TABLE 13 The role of financial constraints on the effects of corporate tax planning on the change in financial constraints

	Low constrained		High constrained	
	(1) Δ WWscore	(2) Δ KZscore	(3) Δ WWscore	(4) Δ KZscore
L.CashEtr	0.182*** (5.76)	0.692*** (5.30)	-0.161*** (-4.97)	-0.833*** (-4.70)
_cons	-2.383*** (-3.54)	-7.082*** (-2.74)	0.826 1.05)	-18.030 (-5.12)
Control variables	Yes	Yes	Yes	Yes
Year-fixed	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes
<i>N</i>	5,912	5,912	5,914	5,914
Adj. <i>R</i> ²	.117	.167	.120	.283
<i>r</i> ²	.131	.180	.133	.294

Note: Bold values represent the values of the variable of interest. For brevity, only tax planning coefficients are reported. Huber–White robust standard errors clustered by firm are used to control for heteroscedasticity and serial correlation.

***Significant at 1% level.

This means that highly constrained firms generally have already exhausted legal and low-cost tax planning approaches and only have very limited options for further tax planning, which are highly costly and risky. In addition, it is common for the tax authority to check the tax reporting of highly constrained firms more carefully, which increases the possibility of penalties for aggressive tax planning. Therefore, although increasing tax planning is an important measure for low-constrained firms to mitigate financial constraints, it is almost impossible for highly constrained firms to mitigate financial constraints by more aggressive tax planning. Managers of high constrained firms are usually more inclined to increase tax planning for the purpose of mitigating financial constraints, but our results indicate that such efforts are almost in vain.

6.4 | The long-run changes in financial constraints

Although the above results indicate corporate tax planning can mitigate financial constraints overall, aggressive tax reporting may only have a short-term effect, instead of a sustainable effect on the mitigation of financial constraints, and may even eventually have a negative impact on a firm. On one hand, aggressive tax planning may bring some negative consequences, which is unfavourable for the mitigation of financial constraints or even exacerbates financial constraints in later years, confirming the Scholes–Wolfson framework. For example, if a firm engaging in aggressive tax reporting is eventually caught by tax authorities in later years, the responsible authorities may severely punish the firm to

an extent that the marginal costs of tax planning may outweigh its marginal benefits. Furthermore, corporate tax scandals are usually associated with reputation loss. Thus, investors may be deterred from dealing with firms well-known for tax scandals, which may increase corporate financial constraints in the following years.

Meanwhile, Desai and Dharmapala (2006) highlight that information asymmetry associated with the complex transactions when concealing tax planning activities can trigger managerial opportunism and rent-seeking behaviour. This may bleed the corporation's resources and decrease its corporate credit rating, which also hinders sustainable mitigation of financial constraints. On the other hand, one of the most commonly used strategies for tax planning is to defer tax payments, which reduces the firm's current tax payments by increasing future tax credits. With time, the deferred tax credits must be repaid by using the cash of later years, which may eventually weaken the positive impact of tax planning on mitigating financial constraints in the long run.

Taking into account all the above diversity of perspectives, we decide to examine the long-term effects of tax planning on mitigation of financial constraints. We start by re-estimating Equation (6) after replacing our measures of the change in financial constraints. We construct Δ FC from year t to $t + 1$, Δ FC from year $t + 1$ to $t + 2$ and Δ FC from year $t + 2$ to $t + 3$.

Table 14 reports our regression results of long-term tax planning effects on changes in financial constraints. We find that the positive impact of tax planning on Δ FC from year t to $t + 1$ is still significant at the 1% level. As for the effect on Δ FC from year $t + 1$ to $t + 2$, the coefficient for Δ WWscore is positive but not significant, and the coefficient for Δ KZscore is significantly positive

TABLE 14 The long-run effect of tax planning on mitigation of financial constraints (full sample)

	(1) $\Delta WWscore$ t to $t + 1$	(2) $\Delta WWscore$ $t + 1$ to $t + 2$	(3) $\Delta WWscore$ $t + 2$ to $t + 3$	(4) $\Delta KZscore$ t to $t + 1$	(5) $\Delta KZscore$ $t + 1$ to $t + 2$	(6) $\Delta KZscore$ $t + 2$ to $t + 3$
L.CashEtr	0.354*** (9.48)	0.067 (1.62)	-0.039 (-0.88)	0.723*** (4.90)	0.385** (2.47)	-0.154 (-0.89)
_cons	-2.271 (-0.86)	2.012 (0.60)	-3.423 (-2.83)	-8.375 (-0.87)	-1.242 (-0.11)	-11.332 (-2.62)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year-fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	9,365	7,227	5,378	9,365	7,227	5,378
Adj. R^2	.070	.001	-.004	.092	.002	-.001
r^2	.079	.013	.012	.100	.015	.015

Note: Bold values represent the values of the variable of interest. For brevity, only tax planning coefficients are reported. Huber–White robust standard errors clustered by firm are used to control for heteroscedasticity and serial correlation.

**Significant at 5% level.

***Significant at 1% level.

at the level of 5%. The coefficients of both $\Delta WWscore$ (year $t + 2$ to $t + 3$) and $\Delta KZscore$ (year $t + 2$ to $t + 3$) are negative but not significant. These results support our above-mentioned argument that the positive impact of tax planning on the mitigation of financial constraints is typically a short-term effect, rather than a long-term effect. Therefore, when firms utilize aggressive tax planning as an important measure to mitigate financial constraints, they should be aware that such a positive effect may last for about 2 years. Firms must try to find some other, more sustainable, measures to improve the financial situation during the period, so as to really improve their financing capability in the long-run.

7 | DISCUSSION

The inability of a firm to access external finance for its investment projects may lead managers to rely more on internally generated funds. As a result, managers place their hopes on reducing such of the firm's expenses that do not compromise product quality. Because taxes are costs without production traces, tax planning becomes an obvious option for managers to improve firms' liquidity position. Based on the tendency of reducing tax liability to save cash to invest in investment projects, using Chinese listed firms, we examine whether tax planning mitigates financial constraints.

The OLS and FE regression test results show that corporate tax planning is significantly and positively associated with the reduction of financial constraints, supporting our hypothesis. These results are robust to various tests. Additional investigations show that the role of tax planning in mitigating financial constraints is more

pronounced among non-SOEs, big firms, non-political firms and firms in the eastern region of China. When characterizing firms' level of financial constraints, we find that corporate tax planning behaviour impedes the mitigation of financial constraints for highly constrained firms, and the positive role of tax planning in mitigating financial constraints only exists in the group of low-constrained firms. Furthermore, we document that the positive impact of tax planning on mitigation of financial constraints is typically a short-term effect, rather than a long-term effect, and eventually has a negative impact on a firm, supporting the Scholes-Wolfson paradigm.

The results from this study suggest tax planning mitigates financial constraints, and the reduction in financial constraints as a result of tax planning is economically significant, supporting the study of Lim (2011) which suggests that tax planning increases financial slack and eliminate potential bankruptcy costs. The results of this study are essential because they extend the literature on both tax planning and financial constraints. By examining the impact of tax planning on financial constraints, this study not only contemplates the potential influencing factors of tax planning on changes in financial constraints but also provides some understanding of the economic benefits derived from high and low tax planning. Furthermore, we contribute to the literature by providing theoretical analysis and empirical support on how different types of firms can mitigate financial constraints using tax planning. Finally, we contribute to the broader literature by providing a clear understanding that tax planning is a temporary short-term measure for mitigating financial constraints. We believe that our findings have vital guiding significance for tax planning strategies and the firm's funding choices. Corporate management

should weigh the costs and benefits of tax planning from the perspective of the long run instead of the short term and understand the limited role of tax planning in mitigating financial constraints. Also, firms should try to find more sustainable and lasting measures in a period of tax planning, so as to mitigate financial constraints in the long run. For instance, when failing to raise funds for specific projects, firms can undertake joint ventures with unconstrained firms to ease cash problems.

8 | CONCLUSION

We examine whether corporate tax planning mitigates financial constraints. Using Chinese listed firms, we find that corporate tax planning reduces financial constraints. We also find that the role of tax planning in mitigating financial constraints is more pronounced among non-SOEs, big firms, non-political firms and firms in the eastern region of China. However, we find that corporate tax planning behaviour impedes the mitigation of financial constraints for highly constrained firms. Furthermore, this study documents that the positive impact of tax planning on the mitigation of financial constraints is typically a short-term effect, rather than a long-term effect, and eventually has a negative impact on a firm. Overall, our study provides evidence that tax planning influences the level of a firm's financial constraints.

However, considering that tax planning is often bundled with complex transactions that would be difficult to capture, it is plausible that managers may utilize this opportunity and divert resources for personal gain, rendering tax planning ineffective. Since the current study ignores the principal agency problems, further research exploring the moderating effect of agency problems on the relation between tax planning and mitigation of financial constraints would need to be explored.

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CONFLICT OF INTEREST

The author declares that there are no financial or personal relationships that may have inappropriately influenced the writing of this article.

ETHICAL STATEMENT

There are no ethical considerations or concerns regarding this research.

ENDNOTES

- ¹ We use the term tax planning to refer to all aggressive tax reporting and tax avoidance actions. We define tax planning as both legal and illegal carefully pondered actions to decrease the firm's tax liability.
- ² Moral hazard is when one party escalates the risk of exposure of another party, bearing in mind that the costs associated with risks will be borne by another party (Miller, Weller, & Zhang, 2002).
- ³ In the case *Commissioner versus Newman* (1947), the judgment was given that "Over and over again courts have said that there is nothing sinister in so arranging one's affairs as to keep taxes as low as possible. Everybody does so, rich or poor, and all do right, for nobody owes any public duty to pay more than the law demands: taxes are enforced exactions, not voluntary contributions. To demand more in the name of morals is mere cant." This suggests that, by all means, a firm will try to minimize its tax liability, as long as the total cash tax savings benefits outweigh the total costs associated with the planning process.

DATA AVAILABILITY STATEMENT

The dataset supporting the conclusions of this paper is submitted as supplementary material to the journal and the file name is Data set.xls.

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