Supplier-base Concentration and Corporate Tax Avoidance

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Abstract. Despite the intensive interactions between firms and their suppliers, there is a scarcity of studies on the potential impact of suppliers on their customers' tax avoidance strategies. Addressing this gap, our research explores how the supplier-base concentration might affect corporate engagement in tax avoidance. By examining a broad dataset of firms listed in China, we discovered that firms with a more concentrated supplier base tend to engage in less tax avoidance. This finding persists even after controling for various other factors that may affect corporate tax avoidance practices. Our findings enrich the existing literature on tax avoidance

Keywords: Supplier-base Concentration; Tax Avoidance; Operational Risk

1 Introduction

The China Securities Regulatory Commission (CSRC) first issued regulations in 2007 that required listed firms in China to disclose the yearly procurements from their top five suppliers in the notes to their annual financial reports, along with their proportion of the firm's total procurement. A revised draft in 2011 strengthened these regulations by requiring firms to provide more detailed information about their major suppliers. Listed firms are required to disclose supplier information partly because suppliers are significant stakeholders who exert a strong influence on the firms' business. Presently, China is at a critical juncture in its economic transformation, facing such issues as imperfect market mechanisms, an incomplete legal system, and high transaction costs. Moreover, there is a severe problem of information asymmetry in China's current market environment.

By establishing cooperative relationships with major suppliers, firms can enhance the mutual understanding of information between enterprises, promote the integration of upstream and downstream supply chains in the market economy, and reduce the corporate cost of equity capital. Consequently, firms focus on maintaining such relationships with their major suppliers, and these suppliers increasingly account for a larger proportion of the firms' procurement expenditures, which leads to supplier concentration. Higher levels of supplier concentration are advantageous for business operations—for example, by improving operational efficiency, reducing operating costs, and gaining competitive advantages. However, as suppliers become more concentrated, firms become more reliant on their major suppliers, and this in turn weakens their risk resistance and bargaining power. Thus, excessive supplier concentration can trigger operational risks for firms and profoundly affect their business decisions.

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Tax avoidance is an important financial decision for enterprises that can reduce their income tax expenses and retain more profits. The cash saved through tax avoidance increases their free cash flow, which helps them cope with short-term risks, alleviates financial pressures, benefits shareholders, and stimulates business growth. Existing research finds that firms with higher customer concentrations tend to engage more in tax avoidance because they are more likely to transfer profits to tax haven subsidiaries through cooperation with their major customers and thus achieve their tax avoidance goals. [1] Similarly, suppliers, like customers, are important stakeholders in firms' supply chains. Existing research has shown that supplier concentration affects a firm's borrowing capacity, operational performance, earnings management, and more, [2]however, the influence of supplier concentration on firms' tax avoidance activities has received scant attention. This study therefore empirically tests the impact of supplier concentration on corporate tax avoidance, based on the top five suppliers disclosed by China's A-share listed non-financial firms from 2007 to 2022. The conclusions of this study enrich the research on how stakeholders in the supply chain influence firms' tax avoidance and will help firms correctly understand and handle their relationships with major suppliers.

2 Method

2.1 Hypothesis development

Firms reduce corporate tax burdens by using accounting policies, tax incentives, and other lawful means without violating tax regulations. Tax avoidance is a widely used tax planning strategy that firms employ to minimize their cash outflows, and it serves as an effective strategy for financing, particularly when firms face constraints on alternative financing methods. Firms are therefore motivated to engage in tax avoidance activities. While many tax avoidance tactics are legal, Bankman[3] implies that firms engaging aggressively in tax avoidance might be considered "poor corporate citizen", which can potentially result in reduced income and increased operational risks. Previous literature argues that when cooperation between a firm and its suppliers is close, more relationship-specific investments are made by both parties. Because the value of these investments decreases upon termination of the cooperative relationship, firms' major suppliers prefer that their trading partner will take on lower operational risks due to challenges in reallocating their specialized assets and sustaining the quality of products and services if their partners were to default. Following this logic, we anticipate that firms with greater supplier concentration will exhibit lower levels of tax avoidance. This is because aggressive tax strategies may tarnish a firm's reputation or elevate its risk of financial distress.

In addition, Porter's Five Forces model considers the bargaining power of upstream and downstream suppliers and customers. If a firm's suppliers are relatively concentrated or the firm purchases a significant portion of its products from a particular supplier, the firm becomes more reliant on its suppliers, leading to higher bargaining power for the suppliers. Bargaining power determines the dominant position in a relationship, which often favors the party with higher bargaining power. Tax planning tactics, particularly those necessitating collaboration, typically incur significant expenses related to gathering information, conducting negotiations, executing strategies, and documenting compliance with tax laws. The suppliers

of firms with higher levels of supplier concentration possess greater bargaining power and autonomy, which makes it challenging for these firms to compel their major suppliers to align with their tax avoidance strategies. Moreover, major suppliers may impose stricter requirements on the firm's accounting conservatism, thereby constraining the firm's tax avoidance practices.

Based on the above analysis, we propose the following hypothesis:

The higher a firm's concentration of suppliers, the lower its degree of tax avoidance.

2.2 Sample selection

We choose A-share listed non-financial firms from 2007 to 2022 as the research sample for this study because the implementation of the new accounting standards in 2007 may have brought about changes in the calculation of relevant financial indicators and, starting in 2007, more firms have voluntarily disclosed the names and purchase amounts of their top five suppliers. We collect all financial data and corporate ownership information for this period, and after excluding observations from financial industry firms and those with any missing data, this study is left with 20,809 sample observations including firms from various industries, predominantly manufacturing and ICT. We adopt the practice of winsorizing the upper and lower 1% quantiles of all continuous variables to eliminate the influence of outliers.

2.3 Variable definitions

We use the most common method to measure tax avoidance. We use the effective tax rate (ETR) to measure tax avoidance because it reflects managers' tax planning activities and is commonly viewed by shareholders as a measure of a firm's tax burden and its overall level of tax avoidance. Following prior research, we calculate ETR as the ratio of total tax expenses(TTE) to pre-tax income(PI) as Eq. (1). We exclude observations with negative pre-tax income because effective tax rates are difficult to interpret when the denominator is negative. Thus, lower ETR values indicate more aggressive tax avoidance.

We utilize the comprehensive definition of tax avoidance proposed by Hanlon and Heitzman[4], which encompasses all activities that reduce a firm's explicit tax obligations. To quantify tax avoidance, we measure the effective tax rate (ETR), which not only reflects the tax planning strategies employed by management but is also considered by shareholders as an indicator of the firm's tax burden and its overall tax avoidance level. Consistent with existing literature, we compute the ETR using the formula where total tax expenses (TTE) are divided by pre-tax income (PI), designated as Eq. (1). We exclude observations where the pre-tax income is negative from our analysis, as ETR values become ambiguous when the denominator in this equation is less than zero. Thus, lower ETR values indicate more aggressive tax avoidance.

$$ETR = TTE/PI \tag{1}$$

Three main methods are commonly used in academia to measure the explanatory variable supplier concentration: (1) the ratio of the procurement from the largest supplier to the total annual procurement; (2) the presence of major suppliers, indicated by whether the procurement from a single supplier constitutes 10% or more of the total annual procurement; and (3) the ratio of the procurement from the top five suppliers to the total annual procurement. We adopt the third method, as it facilitates easier data acquisition and provides more accurate

data; we therefore define $SC1$ as the proportion of the total purchases from the top five suppliers among the total purchases during the year. In order to further exclude industry heterogeneity, we also use a dummy variable (*SC2*), and *SC2* equals one if *SC1* of a firm is greater than the median value of listed firms in the same industry, and zero otherwise.

For this study we refer to previous research,[5] and in our model we also control related variables such as a firm's financial status and corporate governance. All variables are defined in Table 1.

Table 1. Variable definitions

Variable	Description
ETR	The ratio of total tax expenses to pre-tax income
SC1	The ratio of a firm's purchases from its top five suppliers to its total purchases
SC2	Equals one if *SC1* of a firm is greater than the median value of listed firms in the same industry, and zero otherwise
BM	Shareholder equity/firm market value
SOE	A binary variable that equals one if the firm is state-owned, and zero otherwise
First	The ratio of the largest shareholder's holding to the total share capital
Lev	Total liabilities divided by total assets
Age	Natural logarithm of the duration of the firm's listing
Size	Natural logarithm of the firm's total assets
InstOwn	The proportion of the firm's shares that are held by institutional investors
Dual	A binary variable set to one when the roles of chairman and general manager are held by the same individual, and zero if not
Grow	The annual revenue growth rate
CC	The sum of the firm's sales to its top five customers divided by the firm's total sales
ROA	Net profit ratio of total assets, defined as net profit divided by total assets
PPE	Fixed assets divided by total assets
Intang	Intangible assets scaled by lagged total assets
Invent	Inventory-to-total assets ratio at the end of the year

2.4 Regression model

To test this study's hypothesis, we first construct a panel data model to test the impact of supplier concentration on a firm's tax avoidance:

$$ETR_t = \beta_0 + \beta_1 SC1_t + \beta_2 BM_t + \beta_3 SOE_t + \beta_4 First_t + \beta_5 Lev_t + \beta_6 Age_t + \beta_6 Size_t + \beta_7 InstOwn_t + \beta_8 Dual_t + \beta_9 Grow_t + \beta_{10} CC_t + \beta_{11} ROA_t + \beta_{12} PPE_t + \beta_{13} Intang_t + \beta_{14} Invent_t + \Sigma Year + \Sigma Industry + \varepsilon_t, \quad (2)$$

where ETR represents the degree of tax avoidance, $\Sigma Year$ and $\Sigma Industry$ represent the year and industry fixed effects, respectively, and ε represents the random error.

3 Empirical results

3.1 Descriptive statistics

Table 2 offers descriptive statistics for the dataset utilized in this study. The average effective tax rate (*ETR*) across the sample is 18.299, with a minimum of 0.602 and a maximum of 67.883. This wide range indicates a substantial disparity in tax avoidance practices among the firms, with some paying minimal taxes and others paying amounts that constitute over half of their income. To reduce the impact of extreme outliers, we apply winsorization to all continuous variables at the 1% and 99% percentiles annually on a firm-year basis.

Table 2. Descriptive statistics

Variable	Obs	Mean	Std	Min	Max
ETR	20,809	18.299	11.602	0.602	67.883
SC1	20,809	33.545	19.456	4.750	91.020
SC2	20,809	0.420	0.494	0.000	1.000
BM	20,809	0.620	0.255	0.122	1.198
SOE	20,809	0.372	0.483	0.000	1.000
First	20,809	34.636	14.587	9.240	74.240
Lev	20,809	0.420	0.190	0.063	0.847
Age	20,809	2.270	0.674	1.099	3.367
Size	20,809	22.389	1.266	20.140	26.280
InstOwn	20,809	44.719	24.635	0.339	90.842
Dual	20,809	0.272	0.445	0.000	1.000
Grow	20,809	0.196	0.381	-0.410	2.439
CC	20,809	30.18	21.81	1.200	95.97
ROA	20,809	5.222	4.126	0.168	20.938
PPE	20,809	22.320	15.851	0.278	69.357
Intang	20,809	5.020	6.239	0.000	91.093
Invent	20,809	14.368	12.916	0.000	91.501

3.2 Results of the regression analysis

Table 3 displays the regression outcomes for Model (2). The t-statistics are derived from standard errors that have been adjusted for clustering at the firm level. The coefficients for *SC1* and *SC2* are positively significant at the 1% level, suggesting that higher supplier concentration correlates with an increased effective tax rate (*ETR*), indicative of reduced levels of corporate tax avoidance. This relationship is statistically and economically significant. Regarding the control variables, a positive correlation is observed between customer concentration (*CC*) and corporate tax avoidance. The remaining findings align well with previous studies.

Table 3. Supplier-base concentration and tax avoidance

	ETR	
	(1)	(2)
SC1	0.018***	
	(2.99)	
SC2		0.489**

		(2.36)
BM	1.133*	2.226***
	(1.90)	(3.51)
SOE	-0.631**	-0.580*
	(-1.96)	(-1.73)
First	0.013	0.010
	(1.44)	(1.15)
Lev	4.992***	6.095***
	(5.66)	(6.65)
Age	1.598***	1.771***
	(8.11)	(8.65)
Size	-0.130	-0.353**
	(-0.94)	(-2.53)
InstOwn	-0.002	-0.003
	(-0.38)	(-0.55)
Dual	-0.215	-0.198
	(-1.01)	2.226***
Grow	-0.432**	-0.000***
	(-2.07)	(-16.70)
CC	-0.015**	-0.012**
	(-2.55)	(-1.99)
ROA	-0.658***	-0.551***
	(-20.80)	(-16.23)
PPE	-0.027***	-0.027***
	(-2.89)	(-2.79)
Intang	0.035	0.033
	(1.61)	(1.45)
Invent	0.013	0.011
	(1.04)	(0.80)
Year	control	control
Industry	control	control
Constant	12.087***	15.567***
	(3.42)	(4.26)
Observations	20,809	20,809
Adjusted R^2	0.248	0.228

***, **, and * indicate two-tailed significance at the 1%, 5%, and 10% significance levels, respectively.

4 Conclusion

The relationship between supplier-customer dynamics and a firm's financial strategies is significant. Our research explores how the a firm's suppliers concentration influences its tax avoidance practices, revealing that firms with higher supplier concentrations exhibit lower levels of tax avoidance. This study contributes to the academic discourse in several ways. Firstly, it enhances the tax avoidance literature by illustrating how supplier-base concentration can dampen tax avoidance activities. To our knowledge, this is the inaugural study investigating the role of supplier-base concentration in tax avoidance. The results indicate that variations in tax avoidance levels should be evaluated considering the influence of supplier-base concentration on tax planning. Additionally, while taxes play a critical role in various corporate finance decisions, their impact has been notably understated in the finance literature

concerning customer-supplier interactions. Our research addresses this gap by analyzing how supplier-base concentration affects tax avoidance.

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