Does Deleveraging Policy Improve the Performance of Listed Companies? Evidence from a Quasi-Natural Experiment

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Abstract: To investigate the impact of deleveraging policy on corporate performance, financial data for 2452 listed companies in China's A-shares and Hong Kong shares were examined in this article. Using a difference-in-differences estimation model and a quasi-natural experiment in China, we find that deleveraging policy has an inhibiting effect on the corporate performance of mainland enterprises. In terms of the inhibiting effect, private firms suffered more than state-owned enterprises (SOEs). A liquidity-corporate performance model is also being developed to investigate the mechanism of the inhibiting effect of deleveraging policy on corporate performance. The findings show that the deleveraging policy harms corporate performance by reducing firm liquidity.

Keywords: Deleveraging; Capital Structure; Corporate Performance; Difference-In- Difference; Firm Liquidity

Introduction

Following the 2008 financial crisis, China began a process of credit expansion and increased leverage in order to stimulate economic development. In 2015, China shifted policy focus by implementing the supply-side structural reform (SSSR), which has five goals: reducing excess industrial capacity, reducing enterprise leverage, de-stocking property inventories, bringing down costs, and beating economic weaknesses, with the deleveraging policy being highlighted. Using data from China, we investigated whether the deleveraging policy can effectively improve the performance of listed companies in the short term.

This paper focuses on China because of its unique institutional environment and large number of SOEs. Because SOEs have easier access to bank loans and other financing resources than non-state-owned enterprises (non-SOEs), they have received different incentives to deleverage (Lai et al., 2020). According to financial flexibility-based capital structure theories, firms prefer to avoid permanently high leverage in order to have unused debt capacity in the future. Unfortunately, there is little evidence that firms deleveraged to conservative leverage for reasons other than financial flexibility (Harry et al., 2018). Prior to China's SSSR, the leverage ratio of SOEs was higher than that of non-SOEs. After three years, the deleveraging policy has achieved remarkable results in which the leverage ratio of government and enterprise sectors. As reported by China's National Bureau of Statistics, the debt-to-asset ratio of non-financial SOEs was 66.3%, 66.1%, 65.9%, respectively, from 2015 to 2017.

Several empirical studies have found a negative relationship between leverage and performance (González, 2013; Liu and Liu, 2019). This also supports the research conclusion that deviations from optimal capital structure reduce firm value (Harford et al., 2009). There are two major trends in China's deleveraging research. First, qualitative methods are used to discuss the adaptability and effectiveness of deleveraging policies (Wang et al., 2018). Second, quantitative methods are used to empirically investigate the impact of deleveraging policy on the financial sector and corporate capital structure (Shen et al., 2021). However, empirical research on the relationship between deleveraging policy and corporate performance using enterprise-level data is still needed. Several studies have

found that firms of varying opacity have varying success rates of investment projects, resulting in a wide range of performance (Detthamrong et al., 2017).

Based on enterprise-level data, did the deleveraging policy improve or worsen corporate performance? How does the deleveraging policy affect corporate performance? What's the distinction between SOES and non-SOEs? In response to the aforementioned issues, this paper's marginal contribution is as follows. To begin, deleveraging policy is treated as a quasi-natural experiment, and the difference-in-differences model is used to investigate the impact of deleveraging policy on corporate performance. The empirical findings show that implementing a deleveraging policy has a significant inhibiting effect on corporate performance, which gradually decreases over time. Second, the mediation effect test confirmed that enterprise liquidity has a medium effect on the relationship between deleveraging policy and corporate performance. Furthermore, difference analysis reveals that non-SOEs accepted more inhibiting influence through policy implementation than SOEs.

1. Literature review and hypotheses

1.1 Leverage and corporate performance

The relationship between leverage and corporate performance has received a lot of attention. One of the tenets of modern finance holds that different financing methods only affect the ratio of enterprise value between shareholders and creditors, not the total value of the enterprise (Modigliani and Miller, 1958). However, some corporate finance scholars believe that leverage can improve corporate performance (Gill et al, 2011; Tsuruta, 2015). They discover that debt improves strict supervision and control by creditors while decreasing free cash flows over investing in low net present value projects. These findings support the agency theory of debt hypothesis, which holds that higher leverage is associated with higher performance (Jensen and Meckling, 1976).

In contrast, some studies find a stronger negative relationship between leverage and corporate performance in small firms (Tsuruta, 2016; Gharsalli, 2019). The greater their leverage, the greater their risk exposure. When the leverage ratio exceeds the optimal capital structure, the enterprise's financial cost becomes too high, squeezing the profit space. According to capital structure theories, firms adjust their leverage ratio to maintain financial flexibility (Denis; 2011). As a result, firms tend to deleverage after maintaining high leverage for a long time in order to maintain good business performance.

The impact of deleveraging policy as a government intervention differs from enterprise-led deleveraging during a slowdown in economic growth. According to research on the China asset bubble, deleveraging leads to lower asset prices, which discourages capital holders from borrowing abroad and results in tighter currency flows (Chen et al., 2017). When the government enacts a deleveraging policy, financial institutions raise lending rates in order to control the volume of loans, raising the cost of financing (Mei and Song, 2021). When property prices fall or liquidity dries up, highly indebted businesses rely on borrowing to repay their debts (Devlin and Mckay, 2008; Sun, 2016). Most businesses passively reduce their credit scale and reduce their leverage ratio while financial institutions raise their loan interest rate (Ji et al., 2017). When considering factors such as tax, information asymmetry, and transaction cost, some researchers discover that enterprise value is influenced by its leverage ratio. According to Watts and Smith (1992), when total debt is reduced, enterprises expand their investment scale rapidly, increasing their investment return rate. According to Qi et al. (2018), deleveraging of over-indebted enterprises can significantly improve enterprise value. However, this conclusion was reached by employing the OLS method, which is unreliable when applied to policy effect research. The following hypothesis is proposed:

Hypothesis 1：Deleveraging policies assist a small number of China's listed companies in improving corporate performance.

Differences of characteristics

The impact of policy implementation varies by enterprise. In the Chinese context, one of the important factors frequently discussed in many scholars' researches is enterprise ownership. Because the banking and security sectors are dominated by state-owned enterprises, Chinese SOEs frequently enjoy financing priority or preferential treatment (Allen et al., 2005; Chang et al., 2014). Small and medium-sized non-SOEs face more financing constraints than SOEs due to differences in credit policies and financing channels (Rao and Jiang, 2013). According to corporate life-cycle theory, the majority of Chinese non-SOEs are in the developing stage, whereas many SOEs are mature firms. In comparison to mature firms, developing firms have lower debt capacity and ability to repay debt, as well as lower earnings retention (Faff et al., 2016). Deleveraging policy alters the financing environment

and has varying effects on enterprises with various ownership structures. With the implementation of the deleveraging policy, the disadvantage of non-SOEs in obtaining financing will be exacerbated. The following hypothesis is proposed:

Hypothesis 2：The impact of deleveraging policy on non-SOEs is stronger than SOEs.

Role of corporate liquidity

Financial flexibility is a firm's ability to respond to unexpected changes in its cash flows or investment opportunity set, and it is achieved through corporate liquidity, capital structure policy, and payout policy (Denis, 2011). Government financial policies are implemented by transferring capital liquidity from the financial sector to the non-financial sector (Yang, 2018). The Chinese government's deleveraging policy aims to tighten credit for firms in depressed industries or industries with excess capacity. Financial institutions seek to recover loans from firms that lack government credit endorsement, particularly non-SOEs.

Once enterprises with a lack of financial flexibility are pushed out of the credit market, enterprise capital liquidity begins to dwindle, and debt default is unavoidable (Jimenez et al, 2012). Financial flexibility determines capital structure stability, and capital structure is closely related to corporate performance (Arindam and Nandita, 2016). The majority of Chinese firms' development is based on traditional credit expansion and diversified management, which necessitates massive investment (Ongena et al, 2013). When the supply of credit falls, enterprises that are heavily reliant on debt are impacted by liquidity transmission and reduce their investment (Xiao et al, 2014). Some academics have demonstrated that enterprise investment behavior is highly related to performance (Shin and Soenen, 1998). As a result, the following hypothesis must be tested in this paper.

Hypothesis 3: Deleveraging policies have an impact on corporate performance by decreasing corporate liquidity.

2. Data and variables

2.1 Data collection

From 2013 to 2017, the sample for this study was drawn from China's A shares and Hong Kong shares listed companies, with listed companies in China's A shares serving as the treated group and listed companies in Hong Kong shares serving as the control group. To create a better control group that is not affected by the deleveraging policy, we remove the Chinese red chips and other Chinese companies that have Hong Kong shares and ensure that the rest of the companies are only Hong Kong or foreign companies. In addition, during the data processing process, we eliminated financial listed companies, ST listed companies, and companies with extreme values. Annual financial data for sample companies in China's A shares is obtained from the CSMAR and Wind databases, while data for Hong Kong companies is obtained from the official website of the Hong Kong stock exchange and the WIND database. For the companies in China's shares, we also consider whether the company is an SOE or a non-SOE. The total sample size is 2452, with 1376 Chinese mainland listed companies and the remainder from Hong Kong. The Chinese sample consists of 550 SOEs and 826 non-SOEs.

3. Measures of relevant variables

3.1 Measure of dependent variable

Corporate performance. Tobin's Q value, ROE, and ROA are commonly used in existing literature to measure corporate performance (Zhou et al, 2014; Cao and Wang, 2019). Tobin's Q value can not only effectively combine enterprise market data with enterprise financial data, but it can also objectively assess the level of enterprise value growth from market value and enterprise profit. Tobin's Q value, when compared to ROE and ROA, is a better indicator for measuring an enterprise's long-term performance (Yang, 2013). As a result, our measure is consistent with previous studies that use Tobin's Q value as a proxy variable to assess corporate performance. The ratio of corporate assets to corporate market capitalization is equal to Tobin's Q value. In our econometric model, we use the logarithm of Tobin's Q to represent the enterprise's performance level.

3.2 Measure of the independent variable

The impact of deleveraging policy. The independent variable is a dummy variable that equals 1 if the Chinese mainland enterprises which affected by the deleveraging policy and 0 otherwise.

3.3 Measures of control variables

We also control some variables that may affect corporate performance of enterprises. Previous literature documents that corporate performance is affected by firm size (Wang et al, 2019), asset-liability ratio, staff size, profitability, revenue, development speed, cashability, inventory level, board governance capability, management incentive. Summary statistics of our main variables are reported in Table 1.

Table 1 Statistical summary of main variables.

Variable	Symbol	Obs.	Mean	Std. Dev.	Min	Max
Corporate performance	lnTobinQ	12260	0.34	1.08	-4.10	5.91
firm size	lnTA	12260	3.12	1.82	-4.08	10.19
asset-liability ratio	Cratio	12260	0.43	0.42	0.00	18.47
staff size	lnStaff	12260	7.23	1.80	0.00	12.93
profitability	lnProfit	12260	0.15	1.84	-7.44	7.08
revenue	lnSale	12260	2.38	1.87	-11.51	9.83
development speed	RGrate	12260	0.52	6.00	-76.77	434.59
cashability	lnCA	12260	2.47	1.71	-4.39	9.29
inventory level	lnInventory	12260	0.77	2.31	-13.78	7.97
board governance capability	lnD_salary	12260	4.09	2.01	-1.26	11.22
management incentive	lnG_salary	12260	3.30	1.35	-0.11	9.90

4. Methodology
4.1 Differences-in-Differences Model

We utilize DID model to analyze whether deleveraging policy may have a negative effect on corporate performance of Chinese listed companies. The principle of DID model is to treat a policy as a quasi-natural experiment, and analyze the impact by comparing the difference between the experimental group affected by the policy and the control group not affected by the policy. In this paper, we treat China's deleveraging policy as a quasi-natural experiment implemented by government. Based on previous experience of policy researches (Brewer et al, 2018), we select listed companies of China mainland as the experimental group, and those non-Chinese companies in Hong Kong share as the control group. By looking at the difference between the two groups, we investigated effect of deleveraging policy on corporate performance of Chinese listed companies. The model for the analysis is as follows:

$$Y_{it} = \alpha + \beta_1 delever_{it} + \beta_2 time_{it} + \beta_3 delever_{it} \times time_{it} + X_{it} + \varepsilon_{it} \quad (1)$$

Where: Y_{it} represents corporate performance; $delever_{it}$ represents a dummy variable, assigned with value of 1 for one affected company as a treatment group and 0 for non-affected company as a control group; $time_{it}$ represents a time dummy variable, assigned with value of 1 for Year after 2015 (implementation year of deleveraging policy); $delever_{it} \times time_{it}$ represents an interaction term of $delever_{it}$ and $time_{it}$ between the enterprise grouping and the time grouping, and represents the net effect brought by the policy; X_{it} is a vector of control variables which affects a dependent variable, and ε_{it} is an error term. In the model, for coefficients, β_1 and β_2 indicate a fixed company effect and a fixed year effect, respectively; β_3 indicates an interaction effect between $delever_{it}$ and $time_{it}$. If hypothesis 1 is true, β_3 should be significantly negative.

4.2 Mediating effect model

According to capital structure theory, the stronger the liquidity of an enterprise is, the more it will effectively promote the investment of the enterprise (Myers and Rajan, 1998). Therefore, this paper draws on the method of previous researches, and takes corporate cash flow as an intermediary variable to study the mechanism of the impact of deleveraging policy on corporate performance (Huang and Li, 2008). The establishment of the mechanism model of liquidity-corporate performance is divided into two steps. The first step is to model the impact of deleveraging policy on liquidity of the enterprise. The model is constructed as follows:

$$CB_{it} = \alpha + \beta_1 delevr_{it} + \beta_2 time_{it} + \beta_3 delever_{it} \times time_{it} + X_{it} + \varepsilon_{it} \quad (3)$$

Where: CB_{it} represents liquidity of the enterprise, and is measured by cash flow at the end of the year. Other variables settings are the same as above.

The second step is to substitute the interaction term between independent variable and liquidity of the enterprise into model (1) to investigate its influence on the dependent variable. The model is constructed as follows:

$$Y_{it} = \beta_0 + \beta_1 \times delever_{it} \times time_{it} \times CB_{it} + \beta_2 \times delever_{it} \times time_{it} + \beta_3 \times delever_{it} \times CB_{it} + \beta_4 time_{it} \times CB_{it} + \beta_5 \times CB_{it} + X_{it} + \varepsilon_{it} \quad (4)$$

5. Empirical results

5.1 Parallel trend test

In comparison between the results in the pre- and post-implementation of the policy, the corresponding mean curves of the experimental group and the control group are drawn (as shown in Figure 1). The effective time of the impact of the deleveraging policy is 2016 (including 2016) since the process of experimental data collection continues from 2013 to 2017; therefore, the critical time node should be at the end of 2015. Tobin's Q values in this study are drawn on each December 31 from 2013 to 2017. According to Figure 1, Tobin's Q values in both experimental group and the control group show a significant increase before 2015. This satisfies the ground rules for the differential experiment. According to the results, Tobin's Q value of the experimental group showed an obvious downward trend after 2015. The control group's Q value continues to increase slowly and gradually stablize around 0 after 2016 .This demonstrates that there might exist differential changes between the Tobin's Q values of the experimental group and the control group after 2015. Whether such change significantly correlates with the deleveraging policy will be further discussed later.
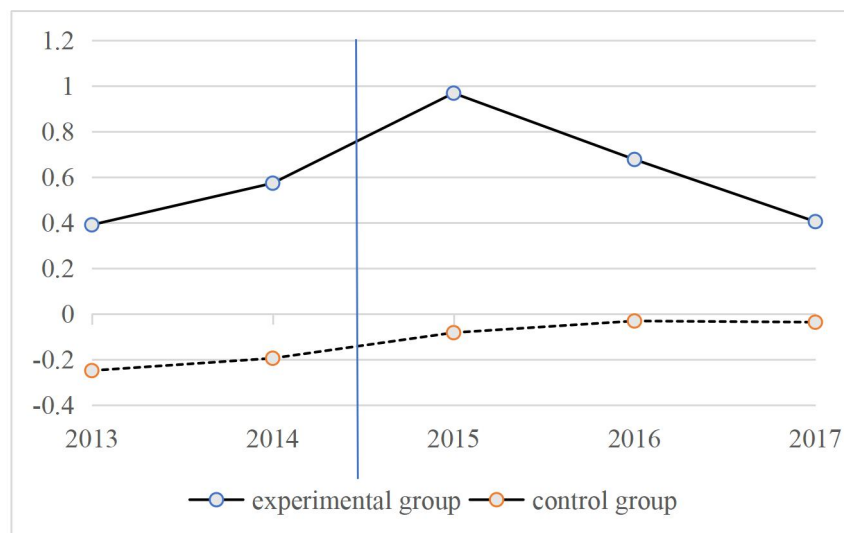

Fig. 1 Parallel trend analysis

5.2 Differences-in-Differences Model

On the basis of Model (1), the ordinary least square method (OLS) and bidirectional fixed effect method (BFEM) are adopted for regression analysis.The regression results are shown as in Table 3. The indicator as DID which equals to time multiplying delever

(DID= $delever_{it} \times time_{it}$) is set to estimate interaction terms. The explanations for understanding the models are as followed:

Model I is the OLS regression coefficient without control variables;

Model II is the OLS regression coefficient with control variables;

Model III is the BFEM without control variables;

Model IV is the fixed effect regression coefficient Model (FEM) with control variables.

The DID model focuses on the coefficients of DID interaction term. According to the data in Model (1), it is found that the interaction term DID is significantly negative at the significant level of 1%. After the control variables are introduced, the interaction term coefficient in Model (2) is still significantly negative at the level of 1%. Also, we found the interaction term DID in model (3) and model (4) are significantly negative at the level of 1% and 5%, respectively. The above empirical results show that the deleveraging policy has a significant inhibiting effect on the performance of mainland Chinese enterprises, which supported Hypothesis 1.

Table 2 The impact of deleveraging policy on corporate performance.

variable	Dependent variable : Corporate performance			
	Model I : OLS	Model II : OLS	Model III : BFEM	Model IV : FE
DID	-0.2387***	-0.0534***	-0.1337***	-0.0606**
	(-5.6915)	(-2.8609)	(-2.7798)	(-2.1108)
time	0.1380***	0.005	0.1374***	0.2501***
	(4.1719)	(0.2692)	(3.0371)	(8.1884)
delever	0.8140***	0.0000	1.3078***	0.0000
	(29.5443)	(.)	(22.9636)	(.)
lnTA			-0.5713****	-0.4840***
			(-28.6763)	(-14.0952)
Cratio			-0.8499***	-0.5564***
			(-16.3378)	(-8.9299)
lnStaff			0.1477***	0.0600***
			(14.3882)	(3.2071)
lnProfit			0.1647***	0.1081***
			(21.8145)	(17.4111)
lnSale			-0.0999***	0.0316
			(-6.8605)	(1.5098)
RGrate			-0.0008	-0.0028***
			(-0.5157)	(-4.0989)
lnCA			0.1435***	-0.0003
			(6.7123)	(-0.0092)
lnInventy			-0.0929***	-0.0815***
			(-12.2782)	(-6.8416)
lnD_salary			-0.0704***	0.0567***
			(3.2647)	(3.1848)
lnG_salary			0.1460***	0.0465**
			(8.2383)	(2.3007)
Year	No	Yes	No	Yes
Firm	No	Yes	No	Yes
N	12260	12260	12260	12260
Pseudo R2	0.1036	0.1234	0.5635	0.4478

5.3 Robustness Checks

We used substitution variable method to test the robustness of our findings above. Following previous research, return on assets (ROA) is used to be the the proxy variable of TobinQ to represent corporate performance, which measure the profitability of an enterprise (Zhu and Zhang, 2013). We used the same model as main empirical analysis and found that the interaction term DID is significantly negative with the introduction of control variables (see Table 4 for details). These proved the finding that Deleveraging policy have a significant inhibiting effect on corporate performance of Chinese mainland listed companies is stable.

Table 4 Robustness test results.

variable	Dependent variable : The natural logarithm of ROA (lnROA)			
	Model I : OLS	Model II : FE	Model III : OLS	Model IV : FE
did	0.0425	-0.1975***	-0.1491***	-0.1239***
	(1.0784)	(-6.9283)	(-4.9504)	(-3.8183)
time	-0.1284***	-0.3284***	0.0336	-0.1572***
	(-4.0691)	(-11.4376)	(1.1762)	(-4.5400)
delever	-0.5126***	0.0000	0.0991*	0.0000
	(-20.1717)	(.)	(1.9400)	(.)
_cons	-2.4284***	-2.6830***	-1.5052***	-1.8996***
	(-12.3404)	(-18.0902)	(-16.5632)	(-13.4751)
Control	No	No	Yes	Yes
Year	No	Yes	No	Yes
Firm	No	Yes	No	Yes
N	9915	9915	6470	6470
Pseudo R2	0.0637	0.0240	0.5804	0.5981

Note: ***, **, * indicate significant difference at the significance level of 1%, 5%, and 10%, respectively.

6. Further discussion
6.1 Heterogeneity Analysis

In order to explore effect of Deleveraging policy on Chinese mainland listed companies of different ownership, we classifies our sample into SOEs and non-SOEs, and uses DID method to do grouped regression estimation. The empirical result shows that the interaction term DID is significantly negative, and the absolute value of coefficients for the non-SOEs group is greater than SOEs group (see Table 5 of model II and Model IV for details). It means the inhibiting impact of Deleveraging policy on non-SOEs is stronger than SOEs, which supports the hypothesis 2.

This result is more than policymakers had expected, for them aim to eliminate excess production capacity of SOEs. The possible reason for the difference effect is as follows. Some researchers consider that SOEs are more directly affected by government policy intervention but non-SOEs are more susceptible to the market due to the difference of ownership. When the Deleveraging policy is implemented, the liquidation of excess capacity by SOEs will intensify competition in corresponding markets, then make non-SOEs' business condition more severe (Cao and Wang, 2019). Others argue that credit mismatch of finance sector is a factor that cannot be ignored. There are ownership discrimination and scale discrimination in Chinese Financial institution, so that non-SOEs are the priority to be restricted on the credit (Li et al, 2011; Zhong et al, 2016).

Table 5 Heterogeneous grouping regression results.

variable	Dependent variable : Corporate performance (lnTobinQ)			
	SOEs		Non-SOEs	
	Model I : RE	Model II : FE	Model III : RE	Model IV : FE

did	-0.1581**	-0.0556*	-0.1411***	-0.0636**
	(-5.6915)	(-2.8609)	(-5.6915)	(-2.8609)
time	0.1538***	0.2477***	0.1437***	0.2478***
	(4.1719)	(0.2692)	(4.1719)	(0.2692)
delever	0.9981***	0.0000	1.1662***	0.0000
	(29.5443)	(.)	(29.5443)	(.)
_cons	0.3879**	1.5501***	0.3553***	1.3533***
	(-7.8028)	(20.7037)	(7.8028)	(20.7037)
Controls	Yes	Yes	Yes	Yes
Year	No	Yes	No	Yes
Firm	No	Yes	No	Yes
N	8130	8130	9510	9510
Pseudo R2	0.541	0.3529	0.5442	0.4463

Note: ***, **, * indicate significant difference at the significance level of 1%, 5%, and 10%, respectively.

6.2 Mediation Test

Following previous researches, we take cash flow as the mediating variable to do mechanism analysis (Han and Li, 2008; Li and Li, 2014). The mechanism model is as model(3) and model(4) we mention above. The empirical results are shown in Table 6. Wherein, Model I is the regression result of FE without introducing control variables, and Model II is the regression result of introducing control variables. According to the results of step one, it is found that the mediating variable cash flow is significantly negatively affected by Deleveraging policy. The results of step two show that the coefficients of interaction term (dtCB) are significantly negative at the 1% level regardless of whether the control variable is added. This indicates the cash flow does act as an intermediary role in policy implementation which Deleveraging policy affects corporate performance by affecting their liquidity.

Table 6 Estimated results of mediating effect model

variable	Dependent variable : CB		Dependent variable : lnTobinQ	
	Step one: Model I	Step one: Model II	Step two: Model I	Step two: Model II
did	-5.5622***	-5.6699***	-0.1122***	-0.1006***
	(-3.7100)	(-3.3347)	(-5.5803)	(-3.3859)
time	5.2451***	6.4947***		
	-3.231	-2.3404		
delever	62.2753***	0.0000		
	-0.5227	(.)		
dtCB			-0.0065***	-0.0056***
			(-3.7462)	(-4.1167)
tCB			-0.0000*	-0.0002***
			(-0.7669)	(-3.5700)
dCB			0.0066***	0.0013
			-4.8282	-1.1698
lnCB			-0.2165***	-0.0233
			(-16.4518)	(-1.0181)
_cons	20.6782***	58.1979***	0.9056***	1.5862***
	-5.5411	-5.4089	-20.6997	-9.9643
Controls	No	Yes	No	Yes
Year	Yes	Yes	Yes	Yes

Firm	Yes	Yes	Yes	Yes
N	12260	12260	12260	12260
Pseudo R2	0.0118	0.0134	0.1704	0.4533

Note: ***, **, * indicate significant difference at the significance level of 1%, 5%, and 10%, respectively.

7. Conclusion and discussion

This article explores the effects of Deleveraging policy on corporate performance of Chinese listed businesses and the difference between SOEs and non-SOEs using difference-in-differences (DID) estimation. To undertake a mediating effect study, we estimate the dynamic effect of the Deleveraging policy and use cash flow as the mediating variable. The following is a summary of our main findings. First, the findings revealed that the adoption of the Deleveraging policy had a major negative impact on Chinese listed companies' performance. This finding backs up prior research (Tsuruta, 2016; Gharsalli, 2019). Second, company ownership is an issue that cannot be overlooked when assessing the impact of policy implementation in the Chinese institutional system. Deleveraging policy had a bigger inhibiting effect on non-SOEs' corporate performance than it did on SOEs, according to our findings. Third, the deleveraging policy's stifling effect on corporate performance of Chinese listed businesses waned quickly. Fourth, by limiting corporate cash, deleveraging policies undermine enterprise operations and corporate performance.

The conclusions of this study have some practical consequences. First, our findings could help policymakers improve policy targeting accuracy, especially in the aftermath of the COVID-19 outbreak. If the goal is to reduce SOE leverage, industrial policymakers should consider company ownership heterogeneity and protect non-SOEs with excess capacity when enacting regulations. Second, the findings may have implications for policymakers and organizations involved in credit rationing. Companies in critical areas and weak links in the national economy, as well as those in the growth stage or engaged in technological innovation, should be given financial resources. Third, the findings may assist various types of businesses in adjusting their development strategies in the post-epidemic period. SOEs should increase operational capacity while avoiding blind expansion and ineffective investment, particularly for "zombie" SOEs. Non-SOEs should prioritize financial flexibility by dynamically controlling leverage, as well as improving profitability and upgrading enterprise structure.

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References

[1] Lai K, Prasad A,Wong G, &Yusoff I. (2020). Corporate deleveraging and financial flexibility: a chinese case-study. Pacific-Basin Finance Journal, 61.

[2] Harry DA. , Gonalves AS, & Stulz RM. (2018). Corporate deleveraging and financial flexibility. Review of Financial Studies, 31(8):3122-3174.

[3] Liu XG, Liu YC. (2019). Leverage, Short-term Debt for Long-term Use and corporate performance. Economic Research Journal, 54(7):127-141.

[4] Harford J, Klasa S, & Walcott N. (2009). Do firms have leverage targets? evidence from acquisitions. Journal of Financial Economics, 93(1), 1-14.

[5] Wang HJ, Yang Z, Ruan GM, et al.(2018). Deregulation of Interest Rate, Excessive Debt and Debt Maturity Structure, Journal of Financial Research, (2), 100-117.

[6] Shen HM, Cheng XK, &Yang MJ.(2021). deleveraging, Stabilizing Leverage and Corporate Capital Structure: Based on Implementation Effects and Paths, Collected Essays on Finance and Economics,(1):75-84.

[7] González VM. (2013), Leverage and corporate performance: international evidence, International Review of Economic Finance, 25:169-184.

[8] Detthamrong U, Chanchara N. and Vithessonthi C. (2017). Corporate governance, capital structure and corporate performance:

evidence from Thailand, Research in International Business and Finance, 42:689-709.

[9] Denis, D. (2011). Financial flexibility and corporate liquidity, Journal of Corporate Finance, 17:667-674.

[10] Gharsalli M. (2019). High leverage and variance of SMEs performance. The Journal of Risk Finance, 20(2), 155–175.

[11] Tsuruta D. (2016). Variance of corporate performance and leverage of small businesses, Journal of Small Business Management, 55(3): 404-429.

[12] Modigliani, F. and Miller, M.H. (1958). American Economic Association The Cost of Capital, Corporation Finance and the Theory of Investment. American Economic Review, 49(4):655-66.

[13] Gill, A., Biger, N. and Mathur, N. (2011). The effect of capital structure on profitability: evidence from the United States. International Journal of Management, 28 (4):3-15.

[14] Tsuruta, D. (2015). Leverage and corporate performance of small businesses: evidence from Japan. Small Business Economics, 53(4):924-948.

[15] Jensen, M.C. and Meckling, W.H. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. Journal of Financial Economics, 3(4):305-360.

[16] Chen YB, Liu ZX, Chen WZ. (2018). The Asset Bubbles Under Economic Growth Slowdown. Economic Research Journall, 53(10): 16-32.

[17] Mei DZ, Song JX.(2021). Financial Sector Openness and Macroeconomic deleveraging. China Industrial Economics, (10):78-97.

[18] Devlin W, Mckay H.(2008). The Macroeconomic Implications of Financial deleveraging. Economic Round Up,(4):47.

[19] Sun LX, 2016. "Corporate deleveraging and Macroeconomic Policies: Evidence from China," MPRA Paper 69140, University Library of Munich, Germany.

[20] Ji M, Yan BY, Li HJ. (2017). Leverage Structure, Level and Financial Stability: Theory and Empirics. Financial Research,(2): 11-25.

[21] Watts R.L. and Smith C. W. (1992). The investment opportunity set and corporate financing, dividend, and compensation policies. Journal of Financial Economics, 32(3):263-292.

[22] Qi HD, Liu H, Zhu W.(2018). Research on deleveraging Performance of Over-indebted Enterprises .Accounting Research, (12): 3-11.

[23] Allen, F. , Qian, J. , & Qian, M. . (2005). Law, finance, and economic growth in china. Journal of Financial Economics, 77(1), 57-116.

[24] Chang C, Chen X., Liao G., 2014. What are the reliably important determinants of capital structure in China? Pacific-Basin Finance Journal, 30, 87-113.

[25] Rao PH, Jiang GH.(2013). The Impact of Monetary Policy on the Relationship between Bank Loans and Business Credits. Economic Research Journal, 48(01): 68-82+150.

[26] Faff R, Kwok WC., Podolski, E.J., Wong, G.. (2016). Do corporate policies follow a life-cycle? J. Bank. Financ. 69, 95-107.

[27] Yang XF. (2018). Research on liquidity crisis under the background of deleveraging. World Economy Studies, (11):44-50+64+136.

[28] Jimenez G, Ongena S, Peydro JL, et al.(2012). Credit Supply and Monetary Policy: Identifying the Bank Balance-Sheet Channel with Loan Applications. American Economic Review, 102(5):2301-2326.

[29] Arindam B, Nandita M. B.(2016).Factors determining capital structure and corporate performance in India: Studying the business cycle effects.The Quarterly Review of Economics and Finance,61:160-172.

[30] Ongena S., Peydro JL., Horen N. V..(2013). Shocks Abroad, Pain at Home? Bank-Firm Level Evidence on the International Transmission of Financial Shocks. DNB Working Papers,63(4):698-750.

[31] Xiao HL, Tang QQ, and Zhou MH.(2014). The impact of debt on firms' innovation investment patterns: based on empirical study of R&D heterogeneity. Science Research Management, 35.10:9.

[32] Shin H., Soenen L.. (1998). Efficiency of working capital management and corporate profitability. Financial Practice and Education, 8:37-45.

[33] Zhou YJ, Zou F, Wang ZR.(2014). Profitability, Technological Innovation Capability and Capital Structure: An Empirical Analysis Based on High-tech Firms. Science Research Management, 35(1): 48-57.

[34] Cao P, Wang GJ.(2019). Does Replacement of Business Tax with Value-added Tax Improve Enterprise Value?Journal of Finance and Economics, (3): 20-30.

[35] Yang D.(2013). Corporate Governance and Corporate Performance -- A Sociological Analysis Based on Chinese Experience.Social Sciences in China, (1): 72-94, 206.

[36] Wang K. Miao, Y. Su CH. et al.(2019).Does Corporate Charitable Giving Help Sustain Corporate Performance in China? Sustainability, 11, 1491.

[37] Brewer Mike & Crossley Thomas F. & Joyce Robert, 2018. "Inference with Difference-in-Differences Revisited," Journal of Econometric Methods, De Gruyter, vol. 7(1), 1-16.

[38] Myers SC, Rajan RG.(1998). The Paradox of Liquidity. Quarterly Journal of Economics, 13(3):733-771.

[39] Han LL, Li K.(2008). Control Rights, Cash Flow Rights and Capital Structure -- An Empirical Analysis Based on Panel Data of Chinese Private Listed Companies .Accounting Research, (3): 66-73, 96.

[40] Zhu Y and Zhang MC. (2013).Enterprise Management Team Human Capital﹐ R&D Investment and Enterprise Performance. Accounting Research, (11):45-52+96.

[41] Li Y, Qin YH, Zhang XF.(2011).Corporate property rights, managerial background and investment efficiency. Management World,(1): 135-144.

[42] Zhong NH, Liu ZK, He JX and Su CL.(2016). The Structural Problem of China's Non-financial Corporate Debt. Economic Research Journal, 51(7): 102-117.