VAT Neutrality and Corporate Cash Holdings —Based on the Research of Uncredited VAT Refund Policy

Yanxiang Xie, Jiaqi Qin, Zhen Jin, Mingyang Geng*

This paper regards the uncredited value-added tax (VAT) refund policy promulgated in 2018 as an exogenous shock to improve the neutrality for VAT. Based on the statistics of listed companies in the non-financial sectors from 2013 to 2020, this paper applies the difference-in-differences (DID) approach to study the impact of the uncredited VAT refund policy on corporate cash holdings. The study finds that the policy has eased the impact of non-tax-neutral impact of non-refundable tax credits and lowered the level of corporate cash holdings. Furthermore, the analysis of capital sources verified that the policy has optimized the corporate capital conditions. These findings have proved to be robust after a series of tests. At the level of cross-sectional differences, the uncredited VAT refund policy exerts both "resource effect" and "signal effect", enabling companies to reduce cash holdings in the dimensions of both tax endowment and market expectation. At the level of policy effects, the policy improved the corporate behavior of high cash holdings for the production and operation cycle, with more notable impact on enterprises with higher tax credit rating. At the level of economic consequences, the adjustment of corporate cash holdings induced by uncredited VAT refund policy has significantly improved operating performance and reduced performance volatility, with a greater impact on enterprises with high capital intensity. The research findings evaluate the uncredited VAT refund policy from the perspective of tax neutrality, laying a theoretical foundation for further optimizing the uncredited VAT refund policy and the modern fiscal, tax and financial systems.

Keywords: value-added tax (VAT), tax neutrality, corporate cash holdings, uncredited VAT refund policy

* Yanxiang Xie is a Ph.D Candidate at Nankai Business School; Jiaqi Qin (corresponding author, email: qjq@nankai.edu.cn) serves as a Professor, Ph.D Supervisor, and Director of Corporate Finance Research Center at School of Finance, Nankai University; Zhen Jin and Mingyang Geng are Ph.D Candidates at Nankai Business School. Fund project: General Project of the National Natural Science Foundation of China "Bank Development, Debt Capital and Corporate Innovation—Mystery of Macro-Micro Contradictions and Its Explanation" (71772091) and Tianjin Research Innovation Project for Postgraduate Students "Research into the Corporate Cash Holdings and Corporate Value amid Digital Financial Development" (2021YJSB079). The authors would like to express appreciation for the valuable suggestions from anonymous reviewers, as well as from associate professor Cheng Cheng of Hunan University and Dr. Yuchen Yang of Nankai University at the 19th Chinese Finance Annual Meeting. The authors take sole responsibility for the paper.

1. Introduction

The fiscal and tax systems, as the financial basis and policy instruments for high-quality economic growth, not only directly motivate microeconomic entities through top-level design, but also play a vital role by optimizing taxation and business environment. According to the *Doing Business 2020* released by the World Bank, China was among the top 10 global improvers of business environment for two years in a row, albeit with great space for improvement in tax indicators. VAT is the largest tax in China. The principle of tax neutrality for VAT requires to avoid distortion of market economic behaviors as much as possible in the taxation process, reduce the excessive tax burden of enterprises, and improve the allocation of market resources. However, under the current VAT shifting law and the design of the deductible range, the gradual backlog of tax credits not only brings financial difficulties to enterprises, undermines production and operation, but also distorts the principle of tax neutrality, which is not conducive to optimizing tax business environment (Ni *et al*., 2019). To further lighten the burden on business entities and optimize the business environment, the Ministry of Finance and State Tax Administration jointly issued the *Notice on Relevant Tax Policies on Uncredited VAT Refund for Certain Sectors in 2018*, listing 18 major categories of industries eligible for refunding the closing balance of retained VAT credit in advanced manufacturing sectors like equipment manufacturing, modern service industry like research and development, power grid enterprises, among others. Compared with the ex-post subsidies under the previous preferential tax policies, the uncredited VAT refund policy smoothed the refund channel, thereby improving the corporate cash flow and the VAT neutrality, and even effectively avoiding the risk of "loses by choice" and "institutional arbitrage" by enterprises (Liu *et al.*, 2020). In addition, as an important means of optimizing the business environment, the policy may further reduce capital costs, improve market prospects and optimize business expectations. Has the implementation of the policy effectively reduced the occupation of corporate funds by distorted VAT neutrality? This paper answers this question based on a study from the perspective of corporate cash holdings.

Cash is a key current asset for an enterprise to maintain operations and development, address future risks, repay due debts, and fulfill tax obligations. Cash holdings constitute an integral part of corporate financial decisions. A heavy comprehensive tax burden and a harsh tax environment affect financial conditions and market expectations, while the potential tax pressure could distort the cash holding behavior of enterprises (McGuire *et al.*, 2014). On the one hand, the high tax credits occupy corporate funds, which increases the capital cost and deteriorates the corporate's financial situation. On the other hand, the market expectations of non-refundable tax credits prompt companies to limit investment and hold a large amount of cash, thereby further distorting the allocation of resources. According to CSMAR data

(as shown in Figure 1), [1] the mean value of tax credits of listed companies and the ratio of companies with tax credits have increased year by year from 2007 to 2020, with the total amount of tax credits in 2020 approximating RMB 600 billion. Meanwhile, the corporate cash holding ratio has remained elevated and the mean value of corporate cash holdings has kept increasing.[2] It can be seen that the large backlog of funds at both ends of the government and enterprises may severely distort the allocation of financial resources, which does not meet the requirements of reducing the burden on entity enterprises and revitalizing the market economy in the stage of high-quality development. Therefore, an in-depth study into the impact of uncredited VAT refund policy on corporate cash holdings in line with the policy of "implementing tax and fee cuts to boost market development" is of great theoretical and practical significance to improve the fiscal, tax and financial systems, better the allocation of financial resources, and revitalize corporate development during the 14th Five-Year Plan period.

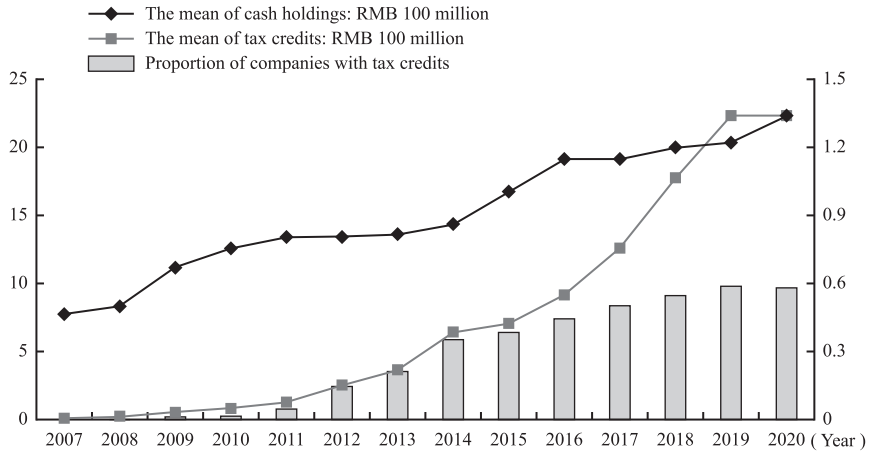

Figure 1. Cash Holdings and Tax Credits of Listed Companies (2007–2020)

In this context, this paper regards the uncredited VAT refund policy promulgated in 2018 as an exogenous shock to improve the neutrality for VAT. Based on the statistics of listed companies in the non-financial sectors from 2013 to 2020, this paper applies

[1] With reference to Wu *et al.* (2021), the scale of tax credits is calculated by subtracting the VAT payable at the year end from the sum of VAT credits and input VAT to be deducted for other current assets in the notes to financial statement. The total amount of cash holdings is calculated with the year-end balance of cash and cash equivalents.

[2] Given the impact of corporate size, it's processed through the total assets of enterprises. It can be seen that the proportion of cash to total assets in listed companies remaines at a high level, while the proportion of tax credits to be deducted to total assets continues to rise. The statistical results are available upon request.

the difference-in-differences (DID) approach to study the impact of uncredited VAT refund policy on corporate cash holdings. The study contributes to the existing research in the following aspects. First, from the perspective of corporate cash holdings, it examines the "resource effect" and "signal effect" of uncredited VAT refund policy on corporate cashing holdings. Based on the samples of advanced manufacturing industry and pilot R&D companies, this paper explains the mystery of high corporate cash holdings, which enriches the literature on corporate cash holdings in China with theoretical contents and empirical data. Second, by associating the policy at the macro level with corporate cash holdings at the micro level, this paper verifies the significant influence of the policy on corporate cash holdings based on the tax neutrality theory, thereby providing new ideas for further optimizing VAT neutrality and devising forward-looking fiscal and tax systems. Third, the phased evaluation of the effects of the policy provides practical experience for reference to apply the policy to all industries and improve the VAT system under the new development pattern during the 14th Five-Year Plan period. Meanwhile, it sends positive policy signals for further improving the allocation of market resources and invigorating market players.

2. Theoretical Analysis and Research Hypotheses

In China, the companies hold cash mainly out of motivations for transaction, prevention and agency business (Wang *et al.*, 2020). In theory, the uncredited VAT refund policy can help reduce the cash holdings of pilot enterprises. For a start, the policy smoothed the channel for refunding VAT credits. Compared with those companies that carry forward the excess input tax, the companies with refunded VAT credits could fully activate the idle funds occupied by VAT credits, thereby increasing the corporate cash flow and reducing capital costs. Meanwhile, the optimized capital conditions may reduce the companies' motivation to hold cash for transaction. Next, the policy can improve the companies' expectations for tax burden and financial risks, while optimized fiscal and tax environment may directly improve the market business environment, thereby reducing the companies' motivation for prevention to hold cash. Lastly, despite the policy's limited influence on corporate governance, the eased tax burden, better capital conditions, and optimized market may prompt companies to reduce cash holdings due to a high agency cost. In this context, the first hypothesis is put forward.

Hypothesis 1 (H1): The uncredited VAT refund policy is conducive to reducing cash holdings of pilot enterprises.

The smooth refund channel is an important prerequisite for giving play to the tax neutrality (Wu *et al.*, 2021). For one thing, the uncredited VAT refund policy reduces the distortion of resource allocation incurred by non-neutral tax by refunding tax credits, prompting companies to lower cash holdings for transactions. This is the "resource effect" of the policy. For another, given the uncredited VAT refund policy, companies

can improve their expectations for VAT neutrality and tax business environment, thereby lowering cash holdings for preventive motivation. This is the "signal effect" of the policy.

As a result of the "resource effect", the tax endowment of corporate cash holdings may be effectively improved. For a start, a high amount of tax credits occupies the capital and increases tax burden of companies. In this context, the uncredited VAT refund policy directly activates the idle funds and eases the financing constraints for companies. It's expected that under the influence of the policy, companies with higher amount of tax credits and more financing constraints can adjust cash holdings to a more notable extent. Next, as the VAT is a turnover tax, the effect of increasing operating cash flow generated by the reform to replace business tax with VAT will emerge gradually, and the ability to shift tax burden will exert an increasingly prominent impact on the operating cash flow (Qiao and Chen, 2017). Compared with companies boasting pricing power and great capability of shifting tax burden to upper- and lower-reach manufacturers, the companies with weak shifting capabilities can reduce cash holdings more notably. Third, unlike the ex-post subsidies and tax incentives based on production profits and pre-tax profits, enterprises have difficult access to substantial tax incentives (Liu *et al.*, 2020). The uncredited VAT refund policy has a greater impact on the companies with low profitability and weak competitiveness.

In terms of the "signal effect", the sustained uncredited VAT refund policy can effectively improve the tax environment for businesses. Compared with regions with weak tax collection and low tax burden, the policy exerts a greater impact on the corporate cash holdings in regions with heavier tax burden. On the other hand, the policy releases the signals of "implementing tax and fee cuts to boost market development", which plays an important role in reducing environmental uncertainty and stabilizing business expectations. The policy is expected to effectively alleviate the distortion of market economic behavior caused by non-neutral VAT credits which are non-refundable and exert a greater impact on the cash holdings of companies featuring high environmental uncertainty and large operating fluctuation.

In addition, compared with enterprises with cash holdings at an "average" level, the uncredited VAT refund policy may produce both "resource effect" and "signal effect" to exert a greater impact on the enterprises featuring limited resource endowments and extremely high cash holdings, along with those featuring well-developed operation model and extremely low cash holdings. It gives rise to the Hypothesis 2:

Hypothesis 2 (H2): The uncredited VAT refund policy produces both "resource effect" and "signal effect" on corporate cash holdings. The "resource effect" brings about effective improvement in terms of the differences in tax endowments of corporate cash holdings. The "signal effect" could effectively improve the expectations about market prospect of corporate cash holdings. The two effects could function together to exert a greater impact on pilot enterprises with extremely high or low cash holdings.

Given that companies' investment and financing decisions are affected by varied

development characteristics at different phases of their lifecycle, the impact of uncredited VAT refund policy on corporate cash holdings varies at different phases of lifecycle due to the factors of "resource effect" and "signal effect". Theoretically, companies in the growth phase are characterized by greater financing constraints, higher capital expenditure, and limited profitability, making them less risk-resistant and difficult to enjoy substantive tax incentives, coupled with a large amount of tax credits (Liu *et al.*, 2020). The uncredited VAT refund policy not only optimizes companies' financial conditions through direct refund, but also raises market expectations by improving fiscal and tax environment. Compared with companies in the growth phase, the companies in the maturity phase boast well-developed business model and stable profitability. In this context, the refunded tax credits and promising expectations may further lower their motivations to hold cash. Unlike companies in the growth or mature phase, those companies in the decline phase face decreasing sales and market shares, financial difficulties, threats of delisting, and risks of mergers & acquisitions. For these companies, the policy may alleviate their financial struggles. In this context, the Hypothesis 3 is put forward:

Hypothesis 3 (H3): Compared with the companies in the decline phase, the uncredited VAT refund policy exerts a greater impact on the cash holdings of companies in the growth or maturity phase.

The uncredited VAT refund policy constitutes an integral part of the measures to optimize the tax environment for businesses against the backdrop of "tax and fee cuts". A favorable tax environment is of great significance for invigorating the microeconomic entities and enhancing the taxpayers' sense of fulfillment (Liu and Fan, 2019). Due to the "signal effect", the policy produces varied impact on the cash holdings of taxpayers at different levels of credit ratings. The taxpayers rated at Level A or B for tax credit will be eligible for refund of end-of-period tax credits. Among the pilot enterprises, those with level-A tax credit rating boast better financial conditions, and thus the refunded tax credits may further improve its financial conditions and reduce its cash holdings. On the other hand, the better market expectations due to the policy also help the enterprises with level-A tax credit ratings reduce their cash holdings. In this context, Hypothesis 4 is put forward.

Hypothesis 4 (H4): Compared with enterprises at other levels of tax credit rating, the uncredited VAT refund policy exerts a larger impact on the cash holdings of enterprises with level-A tax credit rating.

3. Research Design

3.1. Sample Selection

Taking the introduction of the *Notice on Relevant Tax Policies on Uncredited VAT*

Refund for Certain Sectors in 2018 as the exogenous shock to improve the neutrality for VAT, this paper selects all A-share listed companies from 2013 to 2020 as the initial samples for the study.[1] Specifically, first, the year of IPO is deleted from sample period and listed companies given ST (special treatment) and delisted companies are deleted from samples. Second, the samples from financial industry are deleted. Third, samples with missing key variables, abnormal profit margin and/or asset-liability ratio are deleted. Fourth, the relevant continuous variables are winsorized at levels of 1% and 99 %. In the end, a total of 21533 "company—year" samples are obtained, involving 3490 companies. The relevant data is mainly sourced from CSMAR database and WIND database.

3.2. Model Design and Definition of Variables

With reference to Opler *et al.* (1999) and Xie *et al.* (2022), the DID approach is employed to test the impact of uncredited VAT refund policy on corporate cash holdings. According to the *Notice* in 2018, 18 major industries, including advanced manufacturing and modern service industries, and power grid enterprises fall into treatment group,[2] with 2018 as the policy timing. The net effect of the policy is evaluated based on the differences between the treatment group and the control group in terms of development trend before and after the introduction of the policy. At the

[1] With a view to aligning with the Industrial Classification for National Economic Activities with the Industrial Classification of China Securities Regulatory Commission, and identifying the enterprises eligible for uncredited VAT refund under 18 major industrial categories listed in the *Notice* (Cai Shui [2018] No.70), and given that the uncredited VAT refund policy was introduced in 2018, the sample period was set to range from 2013 to 2020 with reference to Wu *et al*. (2021), so as to avoid potential disturbance from a long research period. The *Notice* (Cai Shui [2019] No.39) launched the pilot of the industry-wide refund for the closing balance of retained VAT credit, albeit with stringent criteria for eligible taxpayers that made it difficult to implement the policy across the entire industry. Among the criteria, the "incremental tax credit for six consecutive months is greater than zero" sets quite a high threshold for refund. In addition, the criterion that "the tax credit rating shall be A or B" directly excludes enterprises with Level-M tax credit rating. The subsequent *Notice* (Cai Shui [2019] No.84) relaxed the criteria for some advanced manufacturing industries, albeit still with significant differences among enterprises in the treatment group and the control group. The robustness test takes into account the impact of VAT reforms, including the reform of replacing business tax with VAT, and changes the sample range.

[2] The authors extend thanks to reviewers for their suggestions. The treatment group aligns with the 18 major industries and power grid enterprises listed in the *Notice* (Cai Shui [2018] No.70). The *Notice* stipulates taxpayers eligible for "refund of closing balance of tax credits should be rated at level A or B". However, as the State Taxation Administration released only the annual list of Level-A taxpayers, it's unlikely to obtain the accurate tax credit ratings of pilot enterprises due to limited access to data. Moreover, the *Notice* (Cai Shui [2018] No.71) set varied standards of tax credit refund for different enterprises. Therefore, with reference to Wu *et al*. (2021), if we include the 18 major industries and power grid enterprises listed in the *Notice* (Cai Shui [2018] No.70) directly as the treatment group, the group will incorporate untreated samples, leading to the underestimation of the treatment effect. Since the underestimated treatment effect has significant economic and statistical implications, and VAT as a turnover tax has a great impact across industries, the empirical results cannot change the core conclusions of this paper. In the policy effect test, the pilot enterprises are further divided into the ones with level-A tax credit rating and the ones at other levels of tax credit rating.

same time, the year and firm fixed effects are controlled. Specifically:

$$cashhold_{i,t} = \beta_0 + \beta_1 treat_i \times post_t + \sum controls_{i,t} + \sum firm_i + \sum year_t + \varepsilon_{i,t} \quad (1)$$

Among them, the subscripts *i* and *t* respectively represent the firm and the year, and ε represents the random interference item. The explained variable *cashhold* represents the corporate cash holdings. The *treat* is the grouping variable of the pilot enterprise, setting 1 for the treatment group and 0 for the control group. The *post* is the time grouping variable, setting 1 for the period 2018–2020 and 0 for other years. $\sum$ *controls* represents related control variables. $\sum$*firm* represents firm fixed effect. $\sum$*year* is the year fixed effect. β_1 is the attention coefficient, indicating the impact of uncredited VAT refund policy on corporate cash holdings. The standard errors of regression coefficients are clustered and adjusted at the company level (the same below).

Explained variables. With reference to Faulkender (2002) and Yang and Yin (2018), *cashhold* is defined by the proportion of end-of-period balance of cash and cash equivalents in total assets (*cash*1), non-cash assets (*cash*2) and operating revenue (*cash*3). Given great differences in corporate cash holdings across industries, it's adjusted through industry-year median standard deviations with reference to Fresard (2010). Given the abnormal values of net cash holding ratio in the enterprises with cash making up a large proportion of total assets, coupled with wide potential fluctuations of operating revenue, this paper mainly studies the variable represented as the proportion of end-of-period balance of cash and cash equivalents in total assets (*cash*1).

Core explanatory variables. Among the uncredited VAT refund policy (*treat* × *post*), *treat* is a dummy variable. If the enterprise falls into the 18 major categories of industries and power grid enterprises listed in the *Notice* in 2018, the value of *treat* is 1, otherwise it is 0. If the company's industry changes during the sample period, it's eliminated by manual screening. The *post* is a dummy variable as well. The dummy equals 1 after the introduction of policy, otherwise it is 0.

Control variables. Please refer to Opler *et al.* (1999) and Bates *et al.* (2009). See Table 1 for specific definitions.

Table 1. Definitions of Variables

Type of variable	Name of variable	Symbol	Description
Explained variable	Cash holdings	*cash*1	Cash and cash equivalents/total assets
		*cash*2	Cash and cash equivalents / (total assets–cash and cash equivalents)
		*cash*3	Cash and cash equivalents/operating revenue
		zcash	Cash holdings adjusted by industry-year median standard deviation

Type of variable	Name of variable	Symbol	Description
Core explanatory variable	Uncredited VAT refund policy	*treat*	Dummy variable, equaling 1 for 18 major categories of industries and power grid enterprises listed in the *Notice* (Cai Shui [2008] No.70), otherwise it equals 0
		post	Dummy variable, equaling 1 in and after 2018, otherwise it is 0
Control variables	Firm size	*size*	The natural logarithm of the year-end total assets of the enterprise
	Financial leverage	*lev*	Total debt/total assets
	Operating cash flow	*ocf*	Net cash flow from operating activities/total assets
	Net operating capital	*nwc*	(Current assets–current liabilities–cash) / total assets
	Capital investment	*capex*	Cash paid for the purchase and construction of fixed assets, intangible assets and other long-term assets/ total assets
	Business growth	*grow*	Growth rate of operating revenue
	Dividend payout ratio	*div*	Dividend per share/net profit per share
	Dual posts	*dual*	Dummy variable, equaling 1 if one concurrently serves as chairman and general manager, otherwise it's 0
	Concentration of ownership	*top*1	Shares held by the largest shareholder/total equity
	Board size	*board*	The natural logarithm of the number of directors at the end of the period
	Ratio of independent directors	*indrat*	Number of independent directors at the end of the period/number of board of directors at the end of the period
	Nature of property rights	*soe*	Dummy variable, equaling 1 for state-owned enterprises, otherwise it equals 0

4. Empirical Rest Results

4.1. Descriptive Statistics and Correlation Coefficients Test

Table 2 shows the descriptive statistics of each main variable.[1] It can be seen from Panel A that the mean value of *cash*1 (*cash*2) is 0.150 (0.205), the median is 0.120 (0.136),

[1] Due to space limitations, this paper only includes the descriptive statistics of main variables and more detailed estimation results are kept for reference.

and the standard deviation is 0.113 (0.215). The higher mean value than the median indicates that listed companies in China have high cash holdings. The right-skewed distribution and the long tail on the right suggest great differences in the cash holdings of sample enterprises. The mean value of industry-year adjusted cash holdings (*zcash*) is 0.243 (0.296), and the standard deviation and range are larger than the original ratio of cash holdings, indicating a large gap with the cash holdings of enterprises in the industry. The mean value of the treatment group variable (*treat* × *post*) is 0.277, meaning that the treatment group accounts for 27.7% of the research samples. The statistical results of the control variables are all within a reasonable range and won't be described here.

Table 2. Descriptive Statistics

Panel A: Descriptive statistics of all samples

Variable	Sample size	Mean value	Standard deviation	Min	P25	Median	P75	Max
*cash*1	21533	0.150	0.113	0.011	0.070	0.120	0.198	0.556
*cash*2	21533	0.205	0.215	0.011	0.075	0.136	0.247	1.252
*zcash*1	21533	0.243	0.972	−1.155	−0.453	0.000	0.699	3.515
*zcash*2	21533	0.296	0.948	−0.823	−0.308	0.000	0.545	4.261
treat×*post*	21533	0.277	0.447	0.000	0.000	0.000	1.000	1.000

Panel B: Descriptive statistical tests of groups before and after implementing the uncredited VAT refund policy

Variable	Time	Treatment group (1)	Control group (2)	(1)–(2)	T-test dif	dif in dif	T-test dif in dif
*cash*1	Pre-policy	0.161	0.143	0.018	8.504***	−0.000	−0.178 (0.859)
	Post-policy	0.150	0.141	0.009	4.136***		
*cash*2	Pre-policy	0.225	0.191	0.034	8.105***	−0.004	−1.058 (0.290)
	Post-policy	0.202	0.188	0.014	3.352***		

As can be seen from Panel B, before the implementation of uncredited VAT refund policy, there exist a significant difference in corporate cash holdings (*cash*1*, cash*2) between the treatment group and the control group (both with a significance level of 1%). The mean value of *cash*1 in the treatment group is 0.018 higher than that of the control group, suggesting that the corporate cash holding in the treatment group is significantly higher than that of the control group before implementing the policy. Since the enterprises in the treatment group are mostly in advanced manufacturing sectors like equipment manufacturing or modern service industry like R&D, they face a high demand for funds and intense competition, thereby intending to hold a large amount of cash (Lu *et al.*, 2013). The result is consistent with the actual situation.

After implementing the policy, the mean value of *cash*1 in the treatment group remains notably higher than that in the control group, albeit with the difference down from 0.018 to 0.009, which preliminarily verifies the H1. The results for *cash*2 is basically the same with that for *cash*1 and won't be described here.[1]

4.2. Benchmark Regression Test

The benchmark regression estimation results are shown in Table 3. The results in Columns (1)~(8) show that the coefficients of the uncredited VAT refund policy (*treat*×*post*) are all significantly negative, which verifies the research hypothesis H1. That is, compared with enterprises free from the influence of the policy, those affected by the policy greatly reduced cash holdings after the implementation of the policy. In terms of economic significance, take *cash*1 as an example. Before the introduction of the policy, the pilot enterprises registered an average ratio of cash and cash equivalents to total assets at 16.1%, which dropped by 0.14% (0.009×0.161), at a decrease rate of 5.59% (0.009/0.161), after the implementation of the policy. Given the average assets of RMB 11.5 billion among samples of pilot enterprises, the uncredited VAT refund policy would help them clear an average incremental cash reserve backlog of nearly RMB 11.68 million (0.14%×115), thereby effectively improving the financial conditions of enterprises. Since the potential endogeneity of control variables is not the focus of attention, no further elaborations will be made here.

Table 3. Benchmark Regression Test on the Uncredited VAT Refund Policy's Impact on Corporate Cash Holdings

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	*cash*1	*cash*1	*zcash*1	*zcash*1	*cash*2	*zcash*2	*cash*3	*zcash*3
treat×*post*	−0.017***	−0.009***	−0.113***	−0.044*	−0.022***	−0.040*	−0.059***	−0.056**
	(−5.536)	(−3.157)	(−4.146)	(−1.766)	(−4.090)	(−1.708)	(−5.337)	(−2.147)
cons	0.155***	0.195***	0.025***	−0.123	0.345**	0.236	−0.431	−1.555***
	(183.681)	(2.806)	(3.333)	(−0.202)	(2.543)	(0.417)	(−1.347)	(−2.587)
Control variable	N	Y	N	Y	Y	Y	Y	Y
Company/Year	Y	Y	Y	Y	Y	Y	Y	Y
within R^2	0.003	0.230	0.002	0.212	0.155	0.143	0.155	0.126
N	21533	21533	21533	21533	21533	21533	21533	21533

Note: ***, ** and * represent the significance levels of the statistical test at 1%, 5%, and 10%, respectively. The values in brackets mean the t values adjusted by the robust standard errors (clustering to the company). The same hereinafter.

[1] Among the main variables, the absolute values of the Pearson's and Spearman's correlation coefficients are both lower than 0.6 and the mean value of VIF is 1.37, significantly lower than 10, indicating the absence of severe multicollinearity problem among variables. Due to space limitations, the specific estimation results are kept for reference.

According to the trade-off theory, enterprises will compare the cash holding costs and benefits before determining the target amount of cash holdings, and they'll adjust the cash flow when the actual amount of cash holdings deviates from the target. Therefore, it's necessary to consider the impact of both "stock" and "flow" in the observation of corporate cash holdings. The Formula (1) has been used for analysis of corporate cash structure. From the dimension of "stock", monetary funds, as the main components of enterprises' cash and cash equivalents, are usually subject to overall management and use in practice. They are not allocated for specific purposes in advance (Li and Jia, 2020). From the dimension of "flow", the impact on the cash flow from tax refund and the main sources of cash should also be considered. Specifically:

$$cashform_{i,t} = \beta_0 + \beta_1 treat_i \times post_t + \sum controls_{i,t} + \sum firm_i + \sum year_t + \varepsilon_{i,t} \quad (2)$$

In the above Formula (2), *cashform* represents the main structure of corporate cash holdings,[1] including monetary funds, cash from tax refund, cash from operation & sales, cash from investment returns, cash from disposal, and borrowings. The others are the same with Formular (1). The estimation results in Table 4 show that monetary funds are significantly negative, cash from tax refund is significantly positive, and other sources of cash flow are not significant. It suggests that the uncredited VAT refund policy affects corporate cash holdings in the following ways. From the dimension of "stock", the corporate cash holdings are reduced. From the dimension of "flow", the increased cash from tax refund could effectively relieve the tax burden and improve the financial conditions for enterprises, reflecting the "resource effect" of the policy to supplement cash flow. Since the policy is designed to improve the VAT neutrality, it exerts limited impact on the cash flow generated by production and operation activities.

[1] Cash is highly liquid. The closing balance of cash and cash equivalents are derived from the cash flow statement (direct method), mainly comprising cash, bank deposits, and other monetary funds. Among them, monetary funds, as an indicator of "stock", come from the balance sheet. Cash inflows at the level of "flow" will also affect the corporate cash holdings. From the dimension of "flow", cash received from tax refund, operation & sales, investment returns, disposal, and borrowing respectively corresponds to "refund of tax and fee received", "cash from selling commodities or offering labor", "cash from investment withdrawal", "net cash from disposing fixed assets, intangible assets, and other long-term assets", and "borrowings". The indicators of "stock" and "flow" are relatively independent. Although the uncredited VAT refund policy has a positive impact on the cash flow of enterprises by refunding tax credits to be deducted, there may exist other phased or periodical impacts on cash flow. According to the trade-off theory, however, the policy will reduce the enterprises' target stock of cash holdings. In addition, cash received from tax refund is reflected as the sum of various tax refunds. Given the uncredited VAT refund policy's limited influence on other taxes and fees, the estimated results underestimate the treatment effect.

Table 4. Analysis of Corporate Cash Structure

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	Monetary funds	Cash from tax refund	Cash from operation & sales	Cash from investment returns	Cash from disposal	Cash from borrowings
treat×*post*	−0.0570**	0.040*	−0.012	−0.037	−0.007	−0.007
	(−2.167)	(1.868)	(−0.570)	(−1.513)	(−0.299)	(−1.259)
cons	−0.353	−3.541***	2.986***	−0.411	2.640***	−1.144**
	(−0.562)	(−6.749)	(5.315)	(−0.670)	(5.011)	(−2.131)
Control variables/ Company/Year	Y	Y	Y	Y	Y	Y
within R^2	0.142	0.018	0.116	0.010	0.007	0.037
N	21533	21533	21533	21533	21533	21533

4.3. Parallel Trend, Placebo, and Robustness Test

4.3.1. Parallel Trend Test

With a view to further testing the parallel trend before the implementation of the uncredited VAT refund policy and the possible time lag of the policy, we take inspiration from Wu *et al.* (2021). Taking 2017, one year prior to the introduction of the policy, as the benchmark, the multiplication items generated by *treat* and *year* in each year during the sample period is added in the Formula a (1), shown as follows:

$$cashhold_{i,t} = \beta_0 + \sum_{t=2013}^{t=2020, t\neq 2017} \beta_t treat_i \times year_t + \sum controls_{i,t} + \sum firm_i + \sum year_t + \varepsilon_{i,t} \quad (3)$$

Wherein, β_t is the key coefficient of concern, and the others are the same as in the Formula (1). As shown on the left side of Figure 2, the estimated values of the coefficient β_t before the policy implementation are not significant, in consistent with the assumption about parallel trend. The regression coefficients in the years of and after the policy implementation significantly reduced corporate cash holdings. In addition, the statistical significance and economic significance of the policy effect gradually decreased over time.

4.3.2. Placebo Test

Taking the Column (2) in Table 4 as the benchmark, based on the year of implementing the uncredited VAT refund policy, a corresponding number of enterprises

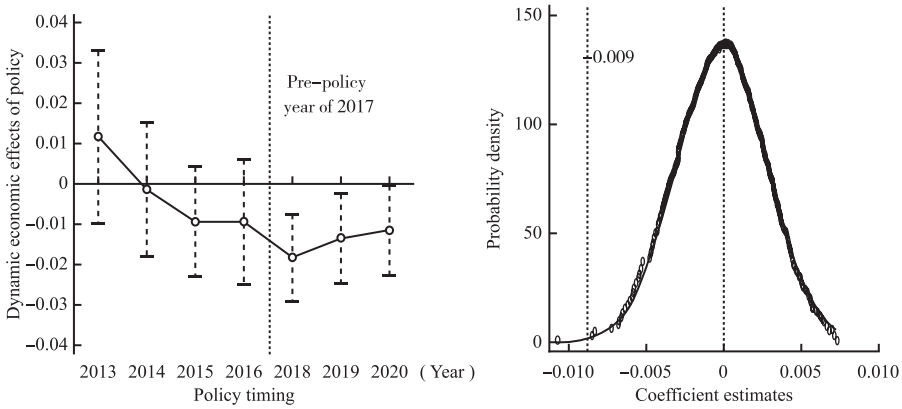

Figure 2. Parallel Trend Test and Placebo Test

are randomly selected to join the treatment group for indirect analysis. The coefficient estimates are:

$$\beta_1^* = \beta_1 + \theta \frac{cov(treat_i \times year_t, \varepsilon_{i,t} \mid \sum controls_{i,t})}{var(treat_i \times year_t \mid \sum controls_{i,t})} \tag{4}$$

Wherein, *controls* represent all observable control variables. If θ is 0, an unbiased estimate is obtained. As shown on the right side of Figure 2, after taking 500 random samples to simulate the random impact of the uncredited VAT refund policy, it can be found that the randomly distributed estimated values are concentrated around 0, far above the benchmark coefficient estimate of –0.009. By means of inverse method, θ equals 0, indicating that other unobserved random factors do not affect the basic conclusion.

4.3.3. Robustness Test

Replacement of explained variables and core explanatory variables. With reference to Faulkender (2002) and Yang and Yin (2018), the explained variables are standardized by total assets, non-cash assets, and sales revenue respectively, and adjusted through year-industry median value and standard deviation, as shown in Columns (1)~(8) in Table 3. As for the core explanatory variables, the policy timing is based on the unit of month, and the calculations are based on the actual months of policy implementation. The variable *treat* equals 1/2 in 2018 and 1 in other years.

Multi-dimensional control of missing variables. First, control the impact of the actual VAT burden and the amount of tax credits to be deducted.[1] Second, control the differences in the tax environment for businesses at the provincial level. Third, control

[1] The actual *VATBurden* is defined as the cash expenditure for VAT divided by the operation revenue.

the high-order joint fixed effects of "time × industry" and "time × province". Fourth, adjust potential influencing factors like heteroscedasticity and autocorrelation by industry clustering, time, and company-level dual clustering.

The observed values may have problems related to time series. First, to alleviate the problem of reverse causality in regression, all explanatory variables are processed using one-phase lag. Second, all sample observations are averaged before and after policy implementation for two-period DID estimations.

Subsample regression. First, given the high cash holdings of start-ups, the balanced panel estimation is adopted. Second, since the uncredited VAT refund policy was implemented in June 2018, the year 2019 is set as the policy timing and the samples in 2018 are deleted, in a bid to exclude the impact prior to the policy implementation in June 2018. Third, given the impact of the reform "to replace business tax with VAT" and the industry-wide application of the uncredited VAT refund policy, 2016–2020 and 2016–2019 are selected as the sample periods for analysis. Fourth, given the accelerated depreciation of fixed assets in the same period and weighted deduction of R&D expenses, the samples of enterprises in the manufacturing industry are selected for analysis, while excluding the samples of high-tech enterprises.

Self-selection sampling test. First, PSM-DID estimation with 1:3 nearest neighbor matching is applied to solve the selection bias of observable variables and ease the impact of time-varying and non-time-varying unobserved variables. Second, the method of entropy balancing—DID is used for estimation.

The results of the robustness test do not change the core conclusion that "the uncredited VAT refund policy reduces corporate cash holdings".[1]

5. Extended Research

5.1. Heterogeneity Test

5.1.1. Heterogeneity Analysis from the Dimension of "Resource Effect"

In the analysis, samples are grouped by the scale of retained tax credit, the financing constraints, the tax burden shifting, and the market competitiveness,[2] with the results shown in Panel A of Table 5. It can be seen that in terms of the scale of

[1] Due to space limitations, the specific estimation results are kept for reference.

[2] The WW index is used to measure financing constraints and the annual median serves as the basis for grouping. With reference to Qiao and Chen (2017), the tax burden shifting is measured by the average values of bargaining power of suppliers and customers and the annual median serves as the basis for grouping. The market competitiveness is measured by the ratio of corporate operation revenue to the total operation revenue of the entire industry of the year, and the annual median serves as the basis for grouping.

retained tax credit and the financing constraints, enterprises with a larger amount of retained tax credits and tighter financing constraints reduced cash holdings more significantly, reflecting better corporate capital conditions as a result of improving VAT refund channel and activating idle capital. In terms of tax burden shifting and the market competitiveness, enterprises with poorer tax burden shifting and market competitiveness reduced cash holdings more notably, indicating that the incentive of uncredited VAT refund policy could ease the tax burden for enterprises more effectively.

5.1.2. Heterogeneity Analysis from the Dimension of "Signal Effect"

Grouped tests are performed in terms of the tax administration of at the regional level and the uncertainty of business environment at the corporate level, with the results shown in Panel B of Table 5.[1] It can be seen that enterprises subject to tougher tax administration, higher uncertainty of business environment, more dynamic environment, and more diverse environment reduced cash holdings more significantly. It reflects that with the implementation of the uncredited VAT refund policy, enterprises would raise their expectations for VAT neutrality and tax environment, thereby reducing cash holdings out of precautionary motives.

Table 5. Heterogeneity Test

Panel A: Tests for direct resource effect

Variable	Scale of retained tax credits		Financing constraints		Tax burden shifting		Market competitiveness	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	High	Low	High	Low	High	Low	High	Low
treat×post	−0.007*	−0.007	−0.016***	0.001	−0.004	−0.010**	−0.000	−0.018***
	(−1.936)	(−1.540)	(−3.883)	(0.394)	(−1.125)	(−2.342)	(−0.006)	(−3.811)
cons	−0.047	0.469***	0.354***	0.065	0.198**	0.193*	−0.045	0.377***
	(−0.396)	(4.071)	(3.327)	(0.590)	(2.037)	(1.832)	(−0.426)	(2.884)
Control variable	Y	Y	Y	Y	Y	Y	Y	Y
Company/ Year	Y	Y	Y	Y	Y	Y	Y	Y
within R^2	0.192	0.235	0.254	0.191	0.219	0.244	0.200	0.252
N	8189	8488	13192	8341	9881	11652	10617	10916
Test diff(P)	−0.001(0.312)		−0.017***(0.000)		−0.006**(0.022)		0.018***(0.002)	

[1] The tax administration in the region where the enterprise is located is calculated based on the method for measuring the pressure imposed by tax environment in Zeng and Zhang (2009), and the annual median serves as the basis for grouping. With reference to the method in Dong *et al*. (2017), the performance fluctuation of the industry of the enterprise measured by the time prediction model is regarded as the environmental uncertainty that's divided into environmental dynamics and diversity. The above market environment variables are grouped by the annual median.

Panel B: Tests for indirect signal effect								
Variable	Tax administration		Environmental uncertainty		Environmental dynamics		Environmental diversity	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Strong	Weak	High	Low	High	Low	High	Low
treat×*post*	−0.010** (−2.486)	−0.004 (−1.056)	−0.012*** (−2.984)	−0.002 (−0.579)	−0.010*** (−2.637)	−0.003 (−0.712)	−0.006* (−1.784)	−0.004 (−0.875)
cons	0.192 (1.558)	0.187** (2.227)	0.315*** (3.745)	−0.111 (−0.988)	0.275*** (3.076)	−0.074 (−0.677)	0.171* (1.774)	0.131 (1.013)
Control variable	Y	Y	Y	Y	Y	Y	Y	Y
Company/ Year	Y	Y	Y	Y	Y	Y	Y	Y
within R^2	0.223	0.234	0.231	0.244	0.228	0.245	0.252	0.213
N	9258	12275	12818	8715	13074	8459	13074	8447
Test diff(P)	−0.007***(0.002)		−0.010***(0.000)		−0.008*(0.060)		−0.003(0.206)	

5.1.3. The Impact of the Uncredited VAT Refund Policy on Extreme Corporate Cash Holdings

In view of the right-skewed thick-tailed distribution of corporate cash holdings, as shown on the left part of Figure 3, quantile regression is used to ease the setting limitations for general mean regression, in a bid to explore the impact of the uncredited VAT refund policy on the tail characteristics of the distribution of corporate cash holdings. Specifically, it's shown as follows:

$$\begin{aligned} &\mathrm{Quant}_{\theta}(cashhold_{i,t} \mid treat_i \times post_t, et.\ \mathrm{al.}) \equiv \\ &inf\{cashhold_{i,t}: F_{i,t}(cashhold_{i,t} \mid treat_i \times post_t, et.\ al.) = \theta\} \\ &= \beta_0(\theta) + \beta_1(\theta) treat_i \times post_t + \sum controls_{i,t} + \sum firm_i + \sum year_t + \varepsilon_{i,t} \end{aligned} \tag{5}$$

The above formula shows the conditional quantile of corporate cash holdings. The function with θ as coefficient of explanatory variable changes with the quantile θ. *Fit* is the function of conditional distributions. θ represents the quantile level of the conditional distribution of explained variables, with the value range of [0, 1]. The others are the same as in Formula (1).

The right part of Figure 3 shows the impact of the uncredited VAT refund policy on the 1%~99% quantile of corporate cash holdings. It can be seen that the policy's overall impact coefficient shows a significant downward trend, which is consistent with the above descriptions. However, the degree of influence presents an "inverted

U-shaped" nonlinear trend with the quantile change. Compared with enterprises with relatively "average" amount of cash holdings, the policy exerts a greater impact on enterprises with extremely high or low cash holdings. A possible explanation is that since the enterprises with extremely high cash holdings feature limited ability for financing and risk resistance, the "resource effect" of the policy could significantly improve their financial conditions, prompting them to reduce cash holdings. Since the enterprises with extremely high cash holdings boast well-developed production and operation model and strong capability for risk resistance, the "signal effect" of the policy could greatly improve their market expectations, prompting them to reduce cash holdings. In this way, the hypothesis H2 is verified.

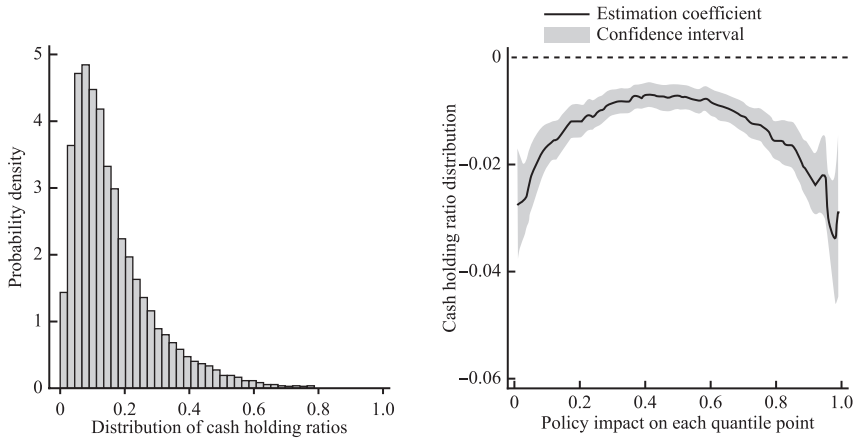

Figure 3. The Distribution of Cash Holding Ratios and the Impact of the Uncredited VAT Refund Policy on Extreme Corporate Cash Holdings

5.2. Policy Effect Test

In order to deliver the benefits of tax and fee cuts in a targeted manner and improve the VAT incentive system aligned with the development stages of enterprises, the cash flow model is applied to categorize sample companies by development phases, comprising the growth phase, the maturity phase, and the declines phase. On such basis, this paper studies the uncredited VAT refund policy's impact on cash holdings of enterprises in various phases. The results in Columns (1)~(3) of Table 6 suggest that the policy produces "resource effect" on corporate cash holdings, significantly reducing the cash holdings so enterprises in the growth, maturity or decline phase. The Column (4) of Table 6 shows that compared with the enterprises in the decline period, the policy exerts a greater impact on the cash holdings of enterprises in the growth or maturity phase, which verifies the hypothesis H3. In addition, since the policy has reduced the non-neutral tax distortion of capital allocation, a favorable tax environment plays an

important role in invigorating microeconomic entities and strengthening the taxpayers' sense of fulfillment. Based on the analysis of samples grouped by the tax credit ratings provided by the State Taxation Administration, the results of Columns (5) and (6) in Table 6 shows that compared with the estimated coefficient of benchmark regression at –0.009, as shown in Column (2) of Table 3, the policy has significantly reduced the cash holdings of enterprises with tax credit rating at Level A and other levels, but most notably those at level A. [1] The results in Column (7) shows that compared with enterprises with tax credit rating at other levels, the policy exerts a greater impact on the cash holdings of Level-A enterprises. In this way, the hypothesis H4 is verified.

Table 6. Policy Effect Test

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	grow	*mature*	*fall*	Full sample	*rankA*	*other*	Full sample
treat×post(tp)	−0.010*** (−2.665)	−0.020*** (−4.170)	−0.018** (−2.312)		−0.0180*** (−5.597)	−0.016*** (−4.104)	
tp×grow (*tp×rankA*)				−0.014*** (−4.453)			−0.017*** (−5.552)
tp×mature *(tp×other)*				−0.030*** (−9.359)			−0.015*** (−4.098)
tp×fall				0.004 (0.881)			
cons	0.175* (1.753)	0.680*** (5.118)	0.935*** (5.405)	0.487*** (6.455)	0.490*** (6.441)	0.497*** (6.042)	0.503*** (6.732)
Control variable/ Company/Year	Y	Y	Y	Y	Y	Y	Y
within R^2	0.066	0.110	0.146	0.077	0.072	0.061	0.069
N	9059	8021	4453	21533	19919	17194	21533

[1] According to the *Notice* (Cai Shui [2018] No.70), the taxpayers with tax credit ratings at Level A and Level B are eligible for the uncredited VAT refund, albeit merely data of Level-A taxpayers is available. The *Administrative Measures on Tax Credit* (For Trial) issued by the State Taxation Administration (STA) in July 2014 has been updated on a yearly basis in line with the taxpayers' performances and the tax credit is rated at four levels at A, B, C, and D. In 2018, the newly established enterprises with no production and operation revenue in the tax year and with no record of dishonest behaviors listed in the *Administrative Measures on Tax Credit* were rated at Level M. The STA merely makes public the annual list of level-A taxpayers. Due to data limitations and given the great impact of VAT as a turnover tax, regression tests are performed between Level-A taxpayers and control group, and between taxpayers at other levels and control group, so as to examine the potential heterogeneity of enterprises at various levels of tax credit in the treatment group. Among them, there are 4339 samples of level-A corporate taxpayers and 1614 samples of corporate taxpayers at other levels, amounting to a total of 5953, making up 27.65%. The estimated coefficients of the treatment group A and the control group, and the treatment group B and the control group are used to directly reflect the policy's heterogeneity effect.

5.3. Economic Consequence Test

Could the adjustment of corporate cash holdings under the influence of the uncredited VAT refund policy effectively improve business performance and stabilize production and operation? To answer the question, an analysis into the economic consequences of adjusting corporate cash holdings under the influence of the policy is conducted from the perspectives of short-term business performance and the fluctuations of operating risks. The specific model is shown as follows:

$$roa_{i,t} / volroa_{i,t} = \gamma_0 + \gamma_1 treat_i \times post_t \times cashhold_{i,t} + \gamma_2 cashhold_{i,t} + \gamma_3 treat_i \times post_t + \sum controls_{i,t} + \sum firm_i + \sum year_t + \varepsilon_{i,t} \quad (6)$$

Wherein, *roa* and *volroa* respectively represent the short-term business performance and the fluctuation of business performance.[1] The critical coefficient γ_1 represents the impact of adjusting corporate cash holdings on explained variables in the context of the uncredited VAT refund policy. The others are the same as in Formula (1). Given the impact of fixed capital input on corporate cash flow, grouped tests by corporate capital density (fixed assets/number of staff) are conducted, leading to results in Table 7. It can be seen that Columns (1)~(3) reflect the positive effect of corporate cash holding adjustments on the short-term performance of enterprises against the backdrop of the policy, while Columns (4)~(6) show that the adjustment of corporate cash holdings exerts a positive effect on the fluctuation of business performances. In addition, theses effects are more significant on enterprises with high capital density, indicating that under the new development pattern, a smooth VAT refund channel is of great significance to the stability and improvement of business performance of enterprises with high capital input.

Table 7. Economic Consequence Test

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	roa	High capital density	Low capital density	*volroa*	High capital density	Low capital density
treat×*post*×*cash*1	0.019**	0.032**	0.005	−0.043***	−0.051***	−0.042**
	(1.999)	(2.285)	(0.348)	(−4.107)	(−3.882)	(−2.555)
treat×*post*	−0.006**	−0.008**	−0.003	0.009***	0.011***	0.008**
	(−2.478)	(−2.432)	(−0.831)	(3.748)	(3.525)	(2.038)
*cash*1	0.040***	0.045***	0.022***	−0.053***	−0.038***	−0.053***
	(6.088)	(4.343)	(2.651)	(−7.817)	(−3.867)	(−5.445)
cons	−0.371***	−0.499***	−0.377***	−0.058	−0.020	−0.099
	(−10.802)	(−8.879)	(−7.168)	(−1.390)	(−0.312)	(−1.631)

[1] *roa* = net profit/total assets. *volroa* shows the fluctuation of corporate earnings in the last three years, albeit with missing samples.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	roa	High capital density	Low capital density	*volroa*	High capital density	Low capital density
Control variable/ Company/ Year	Y	Y	Y	Y	Y	Y
within R^2	0.214	0.249	0.181	0.052	0.054	0.056
N	21533	10683	10850	14669	7217	7452
Test diff(P)		0.0278***(0.002)			−0.009(0.224)	

6. Conclusions and Policy Recommendations

This paper regards the uncredited VAT refund policy issued in 2018 as an exogenous shock to improve the neutrality for VAT. Based on the statistics of listed companies in the non-financial sectors from 2013 to 2020, this paper applies the DID approach to study the impact of the policy on corporate cash holdings. The study finds that the uncredited VAT refund policy has eased the impact of non-neutral tax credits that cannot be refunded and lowered the corporate cash holdings. Furthermore, the analysis of capital sources verifies that the policy has optimized the corporate capital conditions. These findings have proved to be robust after a series of tests. At the level of cross-sectional differences, the uncredited VAT refund policy exerts both "resource effect" and "signal effect", enabling companies to reduce cash holdings in terms of both tax endowment and market expectation. Meanwhile, the effects are more significant on enterprises with extreme levels of cash holdings. At the level of policy effects, the policy has improved the corporate behavior of high cash holdings for the production and operation cycle, with more notable impact on enterprises with higher tax credit ratings. At the level of economic consequences, the adjustment of corporate cash holdings induced by the policy has significantly improved business performance and reduced performance fluctuations, with a greater impact on enterprises with high capital intensity. Based on these findings, the following recommendations are proposed.

For a start, it's necessary to keep advancing and deepening the reform of the uncredited VAT refund system. Currently, the uncredited VAT refund policy has effectively improved the effect of non-neutral VAT. Meanwhile, a smooth VAT refund channel exerts a positive impact on lightening tax burdens, stabilizing market expectations and improving business performance of enterprises. Nonetheless, there still exist the problems like small coverage, rigorous criteria for eligibility, and limited amount of refund. Therefore, in the future reform, it's advisable to focus on expanding the scope, lowering the threshold and increasing the ratio of tax credits for refund, so as to invigorate enterprises and achieve high-quality development.

Next, it's necessary to provide reasonable guidance to help optimize the tax

environment for businesses. The all-round application of the uncredited VAT refund policy is bound to impose new requirements on tax administration and anti-tax avoidance. Potential problems such as yet-to-be-improved refund efficiency, false invoices, and tax fraud will not only damage the tax environment for businesses and affect companies' market expectations, but also result in a massive loss of VAT for the government and disrupt the market order of taxation. Therefore, strengthening the supervision of tax refund processes at the institutional and incentive levels, and integrating tax credit with tax refund system have significant policy implications for improving the uncredited VAT refund policy, tax compliance, and tax environment under the new development pattern.

Finally, it's necessary to give play to the coordinated role of finance and tax, in a bid to perfect the modern fiscal and tax systems. Against the backdrop of "implementing tax and fee cuts to boost market development", the large-scale refund of VAT credits will increase the fiscal burden, thereby forcing a reform of the fiscal system. On the other hand, the reform of fiscal system could give better play to the role of tax cuts. Given the domino effect of the uncredited VAT refund policy as a systematic program, an overall planning should be made for the top-level design. Specifically, the policy's heterogeneous impact on enterprises should be taken into account before adopting targeted measures on key industries and areas at both incremental and stock levels. Meanwhile, the stress should be laid on the integrity of the fiscal and tax systems, so as to avoid potential complex tax system and institutional costs induced by fragmented reforms.

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