The Impact of the VAT Credit Refund Policy on the Cash Flow of A-Share Listed Manufacturing SMEs

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Abstract. Manufacturing SMEs are crucial for stabilizing industrial chains and employment, but face persistent cash flow constraints. As the VAT credit refund policy becomes normalized, its alleviating effect has garnered attention. This paper examines 2019-2024 A-share listed manufacturing SMEs using the difference-in-differences method. The results show the policy significantly improves operating cash flow, increasing the net operating cash flow to total assets ratio by 0.9 percentage points on average. The effect operates through dual channels—easing financing constraints and enhancing operational efficiency—with the latter being more impactful. The policy effect is persistent and more pronounced for high-profitability firms, while showing no significant heterogeneity across firm size or financial risk. Targeted recommendations from governmental and corporate perspectives are proposed to refine policy effectiveness and support manufacturing SMEs' development.

Keywords: VAT Credit Refund Policy; Manufacturing SMEs; Cash Flow; Difference-in-Differences Method

1 Introduction

The manufacturing sector is the foundation of the national economy, and SMEs, as its core driving force, contribute over 60% of China's GDP and 80% of urban employment. They play a key role in stabilizing industrial chains, fostering innovation, and safeguarding jobs. By September 2025, 63.487 million registered SMEs existed nationwide, with 6 million new additions in 2025. Yet global economic slowdown and rising costs hinder their operations. China's structural tax cuts, including large-scale VAT credit refunds, prioritize manufacturing and technological innovation—2024's relevant preferential policies reached 1.1094 trillion yuan, 42.2% of total support for innovation and manufacturing. Particularly since September 2025, manufacturing has been explicitly listed as one of the four industries eligible for full monthly VAT credit refunds, signaling that the policy has shifted from a temporary measure to a normalized and institutionalized arrangement. Meanwhile, high-quality SMEs, represented by specialized and sophisticated enterprises, have developed rapidly. The number of national-level "little giant" enterprises has exceeded 17,600, contributing 13.7% of the

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profits while constituting only 3.5% of the above-scale industrial SMEs, making them a key force in enhancing the resilience of industrial chains.

Academic research on the impact of VAT credit refund policies on corporate cash flow has accumulated along three key dimensions: policy effects, transmission mechanisms, and heterogeneity.

Regarding policy effects, scholars generally confirm its positive value: He Yang (2019) verified that the policy enhances firm value by increasing cash flow and reducing financing costs[1]; Wu Yili (2021) noted that tax refunds optimize investment decisions[2]; Qin Hailin (2022) and Han Xia (2025) confirmed its role in promoting manufacturing upgrading and advanced manufacturing innovation[3][4]; Li Puliang (2024) summarized policy effectiveness from the structural tax reduction perspective[5]; Li Xuhong (2022) emphasized the significance of the 2022 large-scale refund[6].

In terms of transmission mechanisms , existing studies have identified several key pathways: Yu Jie (2022) and Qin Hailin (2022) both confirmed that alleviating financing constraints is a critical channel[7][3]; He Yang (2019) and Zhou Wenxiao (2025) noted that the policy directly improves cash flow and enhances trade credit[18]; Wu Yili (2021) emphasized that tax refunds optimize resource allocation by restoring tax neutrality[2]; Han Xia (2025) verified the policy's incentive effect on innovation in advanced manufacturing[4].

Regarding heterogeneity, policy effects exhibit distinct differentiated characteristics: in terms of firm attributes, Yu Jie (2022), Qin Hailin (2022), and Han Xia (2025) all found that non-state-owned, small and medium-sized, and high-growth enterprises benefit more significantly[7][3][4]; in terms of industry characteristics, Han Xia (2025) and Lu Xiongbiao (2018),respectively highlighted that advanced manufacturing, manufacturing sectors with high credit pressure, and capital-intensive industries show more pronounced effects; in terms of regional and environmental factors[4][8], Zhou Wenxiao (2025),and Yu Jie (2022) confirmed differential effects across eastern, central, and western regions, with stronger benefits observed for enterprises in eastern regions and those in less favorable business environments[9][7].

Despite the existing analytical framework, three gaps remain: insufficient focus on A-share listed manufacturing SMEs; singular mechanism testing; and inadequate heterogeneity analysis, including limited exploration of multi-dimensional interactions and long-term policy effects. Against this backdrop, this study takes A-share listed manufacturing SMEs from 2019 to 2024 as the sample to examine the impact of the VAT credit refund policy on their cash flow and its transmission mechanisms, providing empirical support for policy optimization.

2 Theoretical Analysis and Research Hypotheses

2.1 Theoretical Analysis

The core of the cash flow dilemma for manufacturing SMEs is the mismatch between "capital immobilization" and "liquidity needs" – their capital-intensive nature leads to the long-term accumulation of input VAT credits, while long production cycles require continuous investment in operating funds, resulting in prominent liquidity gaps under

this dual pressure. The core of the 2022 policy of full VAT credit refunds for both "existing and newly accrued credits" is to transform immobilized input tax into freely disposable operating funds. Its cash flow improvement effect can be deeply analyzed through two theoretical frameworks.

Drawing on Financing Constraints Theory (Fazzari et al., 1988), information asymmetry and transaction costs raise external financing costs, a constraint amplified in manufacturing SMEs. Their core assets, often customized production lines, are illiquid and difficult to collateralize, leading to higher risk premiums and reliance on costly non-standard financing. Moreover, weak bargaining power in the industrial chain subjects them to upstream prepayments and downstream payment delays, while volatile operating cash flow undermines creditworthiness. Additionally, immobilized VAT credits further strain internal working capital, creating a cycle of “financing for liquidity–rising costs–worsening cash flow.” The VAT credit refund breaks this cycle by injecting interest-free internal funds to replace high-cost external financing and by improving the balance-sheet structure, signaling operational soundness to lenders, thereby easing subsequent financing constraints and supporting cash-flow improvement.

Based on Operational Efficiency Theory, the sustainability of a firm's cash flow depends on asset turnover efficiency (core indicators are total asset turnover and inventory turnover). Higher turnover efficiency means shorter capital recovery cycles and greater liquidity. Manufacturing SMEs have obvious operational efficiency bottlenecks: First, constrained by capital, they prioritize guaranteeing short-term operations; the service life of core equipment often exceeds 8 years, leading to declines in production precision and energy consumption control capabilities; the unit product production cycle is 20%-30% longer than the industry's advanced level, slowing revenue conversion. Second, raw material costs account for over 60% of operating costs; weak market forecasting ability leads to excessive safety stock, with inventory backlog rates reaching 15%-20%, locking large amounts of capital in raw materials and work-in-progress stages. Third, immobilized VAT credits crowd out funds that could have been used for equipment updates and inventory management upgrades, making it difficult to break through efficiency bottlenecks, further exacerbating the accumulation of VAT credits. Refunded funds can be directed to break these bottlenecks: on one hand, investing in automated production lines and intelligent monitoring system upgrades shortens production cycles and improves total asset turnover; on the other hand, using funds for dynamic inventory monitoring and upstream settlement optimization reduces redundant inventory, shortens turnover days, and accelerates capital recovery, ultimately forming a positive cycle of "efficiency improvement → cash flow optimization."

2.2 Research Hypotheses

From the policy’s direct effect, the VAT credit refund converts 'immobilized input tax credits' into 'disposable operating funds' – cost-free and non-repayable, directly filling SMEs’ short-term liquidity gaps. SMEs’ small asset scales and narrow financing

channels make input tax occupation a key constraint; the refund supplements funds continuously, promoting cash flow improvement. Thus, H1 is proposed:

H1: The VAT credit refund policy significantly improves the operating cash flow of A-share listed manufacturing SMEs.

From the policy's transmission paths, cash flow improvement occurs through dual mediating chains: 'alleviating financing constraints' and 'enhancing operational efficiency.' The former replaces high-interest external financing and optimizes the asset-liability structure; the latter invests in equipment upgrades and inventory management, shortening turnover cycles. The two paths complement each other: financing relief supports efficiency improvements, and efficiency gains further reduce constraints. Thus, H2 is proposed:

H2: The VAT credit refund improves the operating cash flow of A-share listed manufacturing SMEs through the dual mediating paths of "alleviating financing constraints" and "enhancing operational efficiency."

From the perspective of heterogeneous firm characteristics, manufacturing SMEs' sensitivity to the VAT credit refund policy varies significantly due to the amplifying effect of their intrinsic attributes. Small-scale firms, with lower total assets and insufficient collateral, face stricter credit approval and more prominent financing constraints, making the refund's marginal effect in alleviating capital pressure stronger. High-profitability firms possess stronger cost control, market competitiveness, and higher capital turnover efficiency, along with shorter receivables collection periods, enabling refunded funds to be converted more quickly into operating cash flow. Low financial-risk firms do not need to prioritize debt repayment with refunds, allowing most funds to be directly invested in production and operations, thus making the policy's effect on cash flow more direct. Based on this, the hypothesis is proposed:

H3: The cash flow improvement effect of the VAT credit refund exhibits heterogeneity, being more significant among A-share listed manufacturing SMEs that are small in scale, have high profitability, and have low financial risk.

3 Empirical Research Design

3.1 Sample Selection and Data Sources

This research selects 2019-2024 A-share listed manufacturing SMEs based on China's 2017 Enterprise Classification Standards—fewer than 2,000 employees or annual operating income below 400 million RMB. Excluding ST/*ST firms and samples with missing core data, we obtained 3314 valid firm-year observations. The treatment group includes SMEs affected by the 2022 VAT credit refund policy; the control group includes eligible SMEs that did not receive refunds, due to unsubmitted applications or industry-specific exclusions. Data is sourced from the CSMAR database. (Table 1)

Table 1. Variables and Definitions

Variable Type	Variable Name	Variable Symbol	Variable Definition
Dependent Variable	Operating Cash Flow	CF	Net cash flow from operating activities / Total assets at period-end,a relative indicator to eliminate differences in firm size
Core Independent Variable	Difference-in-Differences Term	DID	treat × post, where treat=1 for the treatment group, and post=1 for the years 2022-2024
Mediating Variables	Financing Constraints	SA	SA=-0.737×Size+0.043×Size²-0.04×age, where Size is the natural logarithm of total assets, age is firm age (A larger SA index indicates lighter financing constraints)
	Total Asset Turnover	AT	Operating revenue / Average total assets
Control Variables	Firm Age	age	Current year - Year of establishment
	Firm Growth	growth	(Current year operating revenue - Previous year operating revenue) / Previous year operating revenue
	Return on Assets	roa	Net profit / Total assets at period-end
	Asset-Liability Ratio	lev	Total liabilities at period-end / Total assets at period-end
	Firm Size	size	Natural logarithm of total assets at period-end

3.2 Model Specification

(1) Baseline Regression Model

$$CFit = \alpha 0 + \beta 1 \times DIDit + \sum \beta k \times Controlsit + \mu i + \lambda t + \varepsilon it. \quad (1)$$

Where CFit = operating cash flow of firm i in year t; DIDit = DID term; Controlsit = control variables; μi = firm fixed effects; λt = time fixed effects; εit = random disturbance term. A significantly positive β1 supports H1.

(2) Mechanism Test Model

The stepwise regression method is used to test the mediating effect, verifying the "policy → mediating variable → cash flow" path in three steps.

Step 1: The impact of the policy on the mechanism variable

$$Mit = \gamma 0 + \gamma 1 \times DIDit + \sum \gamma k \times Controlsit + \mu i + \lambda t + \varepsilon it \quad (2)$$

M is either SA or AT. If γ1 is significant, it indicates the policy affects the mechanism variable.

Step 2: The impact of the mechanism variable on cash flow

$$CFit = \delta 0 + \delta 1 \times Mit + \sum \delta k \times Controlsit + \mu i + \lambda t + \varepsilon it \quad (3)$$

If δ1 is significant, it indicates the mechanism variable affects cash flow.

Step 3: Combined regression

$$CFit=\theta 0+\theta 1\times DIDit+\theta 2\times Mit+\sum \theta k\times Controlsit+\mu i+\lambda t+\varepsilon it \quad (4)$$

If θ1 is significant and its absolute value is smaller than β1 from the baseline regression, and θ2 is significant, it indicates the presence of a mediating effect.

4 Analysis of Empirical Results

4.1 Descriptive Statistics

This paper first conducts descriptive statistics on the main variables, with specific results shown in Table 2.

Table 2. Descriptive Statistics

VarName	Obs	Mean	SD	Min	Median	Max
CF	3316	0.046	0.069	-0.148	0.043	0.266
DID	3316	0.150	0.358	0.000	0.000	1.000
age	3316	8.906	6.509	0.000	7.000	32.000
growth	3314	0.079	0.329	-0.633	0.052	1.620
roa	3316	0.021	0.090	-0.372	0.030	0.235
lev	3316	0.334	0.191	0.043	0.302	0.897
size	3316	21.391	0.818	19.268	21.302	25.556
AT	3315	0.512	0.292	0.072	0.449	1.655

CF has a mean of 0.046 (moderate cash flow level) and a minimum of -0.148 (cash flow pressure for some firms). The DID mean of 0.150 indicates 15% of observations belong to the post-policy treatment group, with reasonable sample distribution.

4.2 Baseline Regression Results

Table 3 reports the baseline regression results. Column (1) does not include control variables, while column (2) includes control variables such as firm age, growth, and return on assets to isolate the interference of firm-specific characteristics. After controlling for enterprise-specific characteristics, the regression results demonstrate that the coefficient of the DID term is 0.009, which is statistically significant at the 5% significance level. This indicates that the VAT credit refund policy significantly improved the operating cash flow of A-share listed manufacturing SMEs, thus verifying H1. Among the control variables, roa (0.197***) and AT (0.089***) are significantly positive, indicating that higher profitability and operational efficiency lead to more abundant cash flow; age (-0.002**) and growth (-0.015***) are significantly negative, reflecting that younger, high-growth firms face phased cash flow pressure due to business expansion.

Table 3. Baseline Regression Results

	(1)	(2)
DID Term	-0.010***	0.009**
	(-2.618)	(2.298)
age		-0.002**
		(-2.451)
growth		-0.015***
		(-2.913)
roa		0.197***
		(7.264)
lev		-0.010
		(-0.571)
size		-0.011*
		(-1.757)
AT		0.089***
		(5.934)
constant term	0.047***	0.241*
	(80.104)	(1.936)
N	3316	3314

Note: ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively; t-values are in parentheses. The same applies below.

4.3 Robustness Checks

(1) Parallel Trends Test

To ensure the validity of causal identification using the DID method, and considering the data span from 2019-2024 and the policy timing in 2022, this paper constructs interaction terms of "policy time point × treatment group." The policy time is divided into pre_3 (2019), pre_2 (2020), pre_1 (2021), current (2022), post_1 (2023), and post_2 (2024) to test the parallel trends assumption. Figure 1 confirms the parallel trends assumption. No pre-policy cash flow differences existed between the treatment and control groups. Post-2022, the treatment group's cash flow improved significantly with an increasing trend. The 95% confidence interval includes 0 in the pre-policy period, validating the DID model's causal identification.

(2) Placebo Test

To further rule out the possibility that the baseline results are driven by random factors, this paper conducts a placebo test using permutation testing. Specifically, 500 pseudo-treatment groups are generated by randomly permuting "treatment group status," and the same DID estimation as the baseline regression is repeated, ultimately obtaining the coefficient distribution of the pseudo-DID term.

Figure 2 shows that after 500 estimations with randomly assigned treatment status, the real DID coefficient (0.009) lies far from the center of the pseudo-coefficient distribution, indicating that the baseline result is not generated randomly.

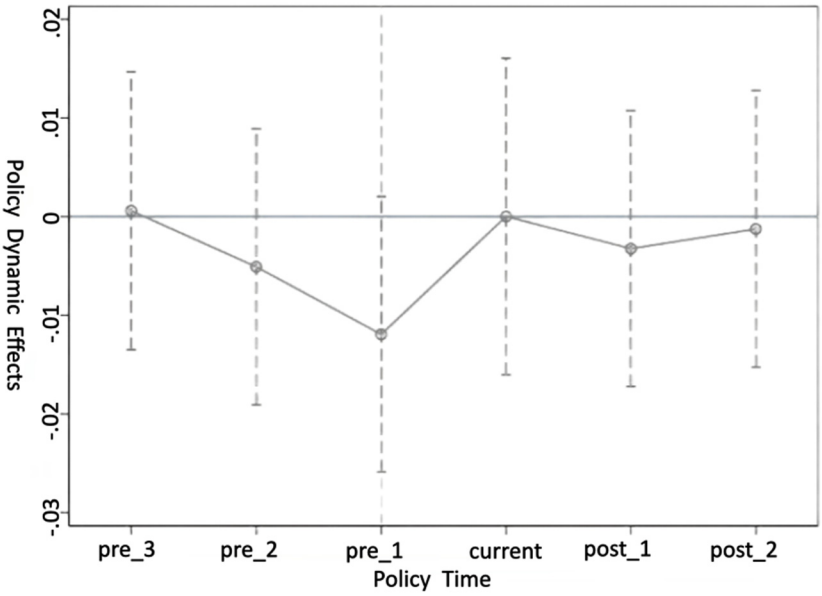

Fig. 1. Parallel Trends Test Results

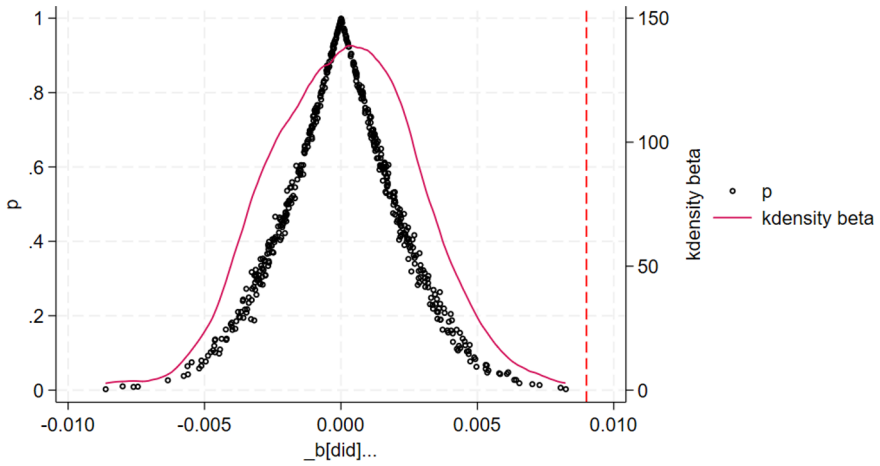

Fig. 2. Placebo Test

Note: The red vertical line indicates the coefficient of the DID term in the baseline regression (0.009). If the pseudo-coefficients cluster around zero, it suggests that the result is non-random.

X-axis: Pseudo-treatment effect coefficients obtained by randomly generating fictitious policy timings 1000 times; 0 is the mean of coefficients.

Y-axis: Kernel density distribution of pseudo-coefficients, reflecting the distribution characteristics of fictitious policy effects.

(3) Other Robustness Checks

To further verify the robustness of the baseline results, this paper employs three methods for additional robustness checks, with results shown in Table 4.

PSM-DID on a matched sample (N=1,571) yields a DID coefficient of 0.001 (p=0.878), statistically insignificant but directionally consistent with the baseline result (0.009). The insignificance is mainly due to the reduced sample size (from 3,314) and SMEs' inherent heterogeneity in industry attributes and regional policy implementation, which challenge covariate balancing. The aligned positive trend nevertheless confirms that sample selection bias does not materially distort the cash-flow effect, supporting the conclusion's robustness.

Table 4. Robustness Check Results

	(1)	(2)	(3)
	PSM-DID	Replacing the Dependent Variable	Winsorization
DID Term	0.001	0.000***	0.009**
	(0.155)	(2.786)	(2.273)
treat	0.000	-	-
	(.)	-	-
post	0.024**	-	-
	(2.335)	-	-
age	-0.003	-0.000***	-0.002**
	(-1.081)	(-3.974)	(-2.366)
growth	0.021*	-0.000	-0.015***
	(1.816)	(-1.020)	(-2.904)
roa	0.303***	0.000*	0.197***
	(4.201)	(1.778)	(7.291)
lev	0.039	-0.000**	-0.010
	(1.096)	(-2.157)	(-0.560)
size	-0.043***	-0.000	-0.011*
	(-3.978)	(-0.123)	(-1.815)
AT	0.040*	0.040*	0.089***
	(1.812)	(2.918)	(5.942)
constant term	0.949***	0.000	0.252**
	(4.236)	(0.396)	(1.990)
N	1571	3286	3314

Note: *** indicates significance at the 1% level; t-values are in parentheses.

4.4 Mechanism Tests

(1) Mediating Effect of Financing Constraints

Mediating Effect of Financing Constraints: The policy's DID coefficient on SA is 0.0059 (insignificant but positive, indicating a trend of alleviating constraints). The SA coefficient is significantly -0.00879, verifying 'alleviating financing constraints →

improving cash flow.' When both DID and SA are included, the DID coefficient slightly increases, confirming a partial mediating effect.

(2) Mediating Effect of Operational Efficiency

Column (5) reports a DID coefficient of -0.0129 (p>0.1) on operational efficiency (AT). Though statistically insignificant, the negative sign aligns with AT's positive measurement, suggesting a trend that the policy may improve efficiency by optimizing asset allocation and reducing redundancies—a effect possibly lagged due to long equipment-update cycles. Column (6) shows a significantly positive AT coefficient, confirming that higher efficiency improves cash flow. Column (7) includes both DID and AT: the DID coefficient rises slightly while AT remains significant, indicating a partial mediating role for operational efficiency. (Table 5)

In short, the VAT credit refund improves cash flow through two partially mediating channels, with the operational-efficiency path being somewhat stronger. This implies that directing refunds toward operational upgrades, such as equipment renewal and inventory turnover, can enhance cash flow more noticeably.

Table 5. Mediating Effect Regression Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	CF	SA	CF	CF	AT	CF	CF
DID	0.00416	0.00598	-	0.00421	-0.0129	-	0.00533
	(0.00431)	(0.00658)	-	(0.00429)	(0.0131)	-	(0.00428)
age	-0.00301**	-0.0355***	-0.00342**	-0.00335**	-0.00296	-0.00286**	-0.00274*
	(0.00152)	(0.00113)	(0.00160)	(0.00163)	(0.00334)	(0.00145)	(0.00150)
growth	-0.000142	-0.00536	-0.000242	-0.000193	0.131***	-0.0122**	-0.0121**
	(0.00548)	(0.00519)	(0.00549)	(0.00549)	(0.00987)	(0.00535)	(0.00535)
roa	0.234***	0.0208	0.234***	0.235***	0.444***	0.194***	0.194***
	(0.0289)	(0.0184)	(0.0288)	(0.0289)	(0.0720)	(0.0267)	(0.0267)
lev	0.00503	0.00304	0.00450	0.00506	0.184***	-0.0125	-0.0118
	(0.0168)	(0.0279)	(0.0167)	(0.0168)	(0.0551)	(0.0171)	(0.0172)
size	-0.0173***	1.072***	-0.00714	-0.00714	-0.0989***	-0.00734	-0.00830
	(0.00558)	(0.0109)	(0.0191)	(0.0191)	(0.0203)	(0.00588)	(0.00600)
SA	-	-	-0.00879	-0.00951	-	-	-
	-	-	(0.0174)	(0.0173)	-	-	-
AT	-	-	-	-	-	0.0911***	0.0914***
	-	-	-	-	-	(0.0151)	(0.0152)
_cons	0.438***	-19.03***	0.255	0.257	2.577***	0.184	0.203
	(0.114)	(0.232)	(0.342)	(0.343)	(0.411)	(0.122)	(0.125)
N	3314	3314	3314	3314	3314	3314	3314

4.5 Heterogeneity Analysis

To further explore the heterogeneous impact of the policy shock on the cash flow of manufacturing SMEs, this paper conducts subsample regressions based on three di-

mensions: firm size, profitability, and financial risk. The heterogeneity analysis results are shown in Table 6.

Table 6. Heterogeneity Analysis Results

VARIABLES	(1) Size - Large	(2) Size - Small	(3) Profitability - High	(4) Profitability - Low	(5) Fin.Risk - High	(6) Fin.Risk - Low
did	0.007	0.009	0.009*	0.005	-0.004	0.006
	(0.006)	(0.007)	(0.006)	(0.007)	(0.007)	(0.007)
Size	-0.020**	-0.025**	-0.020**	-0.012	-0.019**	-0.005
	(0.008)	(0.010)	(0.008)	(0.008)	(0.008)	(0.007)
ROA	0.233***	0.217***	0.641***	0.072***	0.138***	0.354***
	(0.041)	(0.043)	(0.067)	(0.027)	(0.032)	(0.056)
Lev	0.050*	-0.007	-0.006	0.001	0.005	0.054
	(0.029)	(0.022)	(0.030)	(0.020)	(0.026)	(0.042)
Age	0.014*	0.006	-0.001	-0.034***	0.005	0.009
	(0.007)	(0.009)	(0.002)	(0.007)	(0.008)	(0.012)
Constant	0.324	0.518**	0.458***	0.624***	0.389*	0.071
	(0.206)	(0.236)	(0.175)	(0.196)	(0.206)	(0.196)
Observations	1,615	1,624	1,574	1,584	1,601	1,606
R-squared	0.509	0.524	0.585	0.377	0.447	0.566
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes

(1) Heterogeneity Performance in the Firm Size Dimension

Firm Size: There is no significant heterogeneity. The coefficients are 0.007 and 0.009, and both are insignificant.

(2) Heterogeneity Performance in the Profitability Dimension

The coefficient for the "Profitability - High" subsample (column 3) is 0.009 (significant at 10%), while that for the "Profitability - Low" subsample (column 4) is 0.005 (insignificant). The policy weakly boosts high-profitability firms' cash flow (their efficient capital turnover converts refunds quickly to operating cash flow); low-profitability firms use funds to cover losses or repay debts, offsetting the effect.

(3) Heterogeneity Performance in the Financial Risk Dimension

The coefficients for the "Financial Risk - High" (column 5) and "Financial Risk - Low" (column 6) subsamples are -0.004 and 0.006, respectively (neither significant). High-risk firms use refunds to repay debt; low-risk firms face little inherent cash flow pressure—this blunts the policy's impact, so no heterogeneity emerges in this dimension.

In summary, the policy's heterogeneous effect on the cash flow of manufacturing SMEs is generally weak. Only high-profitability firms show a slight positive response,

with no significant variation by firm size or financial risk. This indicates the policy acts more as a “universal” support than a differentiated incentive. Future research could further examine the boundaries of its effect in light of specific policy provisions.

5 Research Conclusions and Policy Recommendations

5.1 Research Conclusions

Based on 2019–2024 A-share listed manufacturing SMEs panel data, using the difference-in-differences method and stepwise regression, the core conclusions are as follows:

The policy significantly improves operating cash flow, increasing the net operating cash flow-to-total assets ratio by 0.9 percentage points (significant at 5%), validated by multiple robustness checks.

Differences exist in the effects of the dual transmission paths. The VAT credit refund exerts partial mediating effects on cash flow through the two paths of "alleviating financing constraints (SA index)" and "improving operational efficiency (AT)." Although the direct impact of the policy on the SA index and AT did not reach statistical significance, both a decrease in the SA index and an increase in AT were confirmed to significantly promote cash flow improvement. In terms of effect strength, the economic significance of the operational efficiency path is significantly stronger than that of the financing constraint path. This reflects that manufacturing SMEs tend to prioritize allocating refund funds to areas that directly enhance operational efficiency, such as equipment updates and inventory turnover, thereby improving cash flow more efficiently.

The policy effect possesses long-term nature and stability. Analysis based on long-term data from 2019-2024 shows that the policy effect exhibits an increasing trend after its implementation in 2022. This indicates that the improvement effect of the VAT credit refund on the cash flow of manufacturing SMEs is not a short-term relief measure but possesses persistence and stability, providing stable financial support for long-term operations

5.2 Policy Recommendations

(1) Government Level: Optimize Policy Implementation Efficiency and Strengthen Targeted Empowerment

Promote digital refund processes via a 'single window' integrating customs, tax, treasury, and bank data, enabling 24/7 online applications and one-business-day processing. Establish a dynamic policy monitoring mechanism. Provide combined support (directed financing subsidies, technological transformation grants) for low-profitability and traditional manufacturing SMEs. Refine policy applicability standards. Optimize the calculation method for refund amounts considering specific industry attributes and regional development differences, giving priority refund support to SMEs under high pressure from accumulated VAT credits or those in key industrial chain segments.

(2) Enterprise Level: Improve Capital Utilization Efficiency and Strengthen Endogenous Momentum

High-profitability firms should allocate refund funds to equipment upgrades and supply chain optimization to enhance operational efficiency. Low-profitability firms need to first focus on rectifying core business issues, such as addressing extensive management or insufficient product competitiveness, before using refund funds to expand markets or supplement liquidity. Proactively engage with digital refund platforms, standardize financial accounting and declaration processes to ensure compliance with refund conditions like maintaining an A or B-level tax credit rating, and avoid missing policy support due to non-standard procedures.

5.3 Future Research Directions

Based on the limitations of this study and developments in policy practice, future research can expand in three areas: Expand the sample scope to non-listed manufacturing SMEs to enhance generalizability; Extend the research period to track long-term impacts on R&D investment and technological innovation; Deepen heterogeneity analysis. Incorporate more dimensions such as ownership structure and regional business environment to explore the interactive effects of multiple heterogeneous characteristics, providing a basis for more refined policy design.

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