



The Impact of Supply Chain Finance on Integrated Business Performance of New Energy Vehicle Enterprises

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Abstract

With the rapid development of the new energy vehicle (NEV) industry, supply chain finance (SCF) has become one of the key factors promoting the prosperity of this industry. Based on in total 884 samples, this study investigates the impact of SCF on the integrated business performance of NEV enterprises. Through empirical analysis, it is confirmed that SCF significantly and positively affects the integrated business performance. In addition, the results of the mediation effect test indicate that by alleviating financing constraints of small and medium-sized enterprises, SCF enables the improvement of firms' overall business performance. These findings provide new insights to NEV enterprises' financing and reference for policy-makers.

Keywords: new energy vehicles, supply chain finance,

integrated business performance, intermediary effect.

1 Introduction

1.1 China's booming new energy vehicle industry

Since the convening of China's 18th National Congress of the Communist Party, the leadership of the Central Committee of the Communist Party of China (CPC) has foreseen the booming of the automobile market, especially the large growth potential of new energy vehicle (NEV) industry. They have formulated numerous strong plans and policies to drive the development of domestic NEV market.

In 2012, China's State Council released the *Energy-Saving and New Energy Vehicle Industry Plan for 2012 to 2020*. In which, it clearly pointed out that all levels of government should accelerate the planning and implementation of domestic energy saving and emission reduction. With special focus on NEV industry, reasonable technical support and management measures should be explored to meet sustainable growth requirements. In March 2015, China's Premier Li Keqiang organized and convened the Standing Committee of State Ministries and Commissions, unveiled a national strategy named "*Made in China 2025*", focusing on promoting manufacturing. As the first 10-year action plan, it



Academic Editor:

Jinchao Chen

Submitted: 24 May 2024

Accepted: 31 August 2024

Published: 23 October 2024

Vol. 2, No. 4, 2024.

[10.62762/TIOT.2024.262824](https://doi.org/10.62762/TIOT.2024.262824)

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Citation

Wang, C., Zhou, S., Ye, J., Hu, H., Wu, X., He, Z., & Ding, H. (2024). The Impact of Supply Chain Finance on Integrated Business Performance of New Energy Vehicle Enterprises. *IECE Transactions on Internet of Things*, 2(4), 63–73.

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categorized NEV industry development as one of the targets. In 2017, China's Vehicle Engineering Society released the *Medium and Long-Term Development Plan for the Automobile Industry*, putting forward the goal to promote NEV production and sales growth in China. According to the plan, China's domestic produced NEVs are expected to grow up to 7 million by 2025. Later in November 2020, China's State Council again emphasized this NEV development and promotion as one of the most important national strategy.

According to the statistics released by China's Ministry of Public Security, the number of domestic motor vehicles has reached 435 million by the end of 2023. NEVs amounted to 20.41 million, accounting for 6.07% of the total vehicles. Among NEVs, battery electric vehicles are in total of 15.52 million, accounting for the vast majority as 76.04%.

In 2023 alone, there are 7.43 million NEVs newly registered, increased 2.07 million comparing to 2022. NEVs' figure rapidly climbed from 1.2 million in 2019 to 7.43 million in 2023, demonstrating a high-speed growth.

Judging from the NEVs sales growth rate, China's NEV market is still in the early stage of development. The demand for NEVs is expected to grow. With the stimulation of China's policies, the transition speed from traditional gasoline vehicles to NEVs will be faster, along with the increasingly expansion of NEV market.

1.2 Supply Chain Finance Development

In recent years, the implementation of supply chain financial management has become a key strategy in the industry. SCF ensures the seamless integration of logistics and capital flow and can effectively cut costs even in the case of an ever-lengthening supply chain.

Under the vigorous promotion of the CPC Central Committee and the State Council, developing the digital economy has been clearly clarified as China's national strategy. The CPC Central Committee pointed out in the "14th Five-Year Plan", it is aimed to actively create new advantages in the digital economy and drive the revolution of production modes along with digital transformation. In the report of the 20th National Congress of the CPC, "accelerate the development of digital economy" is proposed as well, to actively accelerate the establishment of "digital China".

The report of the 20th National Congress of the CPC

puts forward, "efforts will be made to improve the total factor productivity, to enhance the resilience and security level of the industry chain and supply chain". The stability and smoothness of the industry chain and supply chain is vital to whether China can better adapt to the new changes and trends of economic globalization. Now China's automobile industry has gradually stepped into the international market, and has significantly changed the competitive situation. The characteristics of complexity and refinement of the supply chain lead to high risks. Supply chain resilience reflects its performance to resist shocks and recover from risks. Enterprises with high supply chain resilience will be more competitive in current fierce business environment. Nowadays, the global risks are intensifying, it is of great significance in terms of both theoretical and practical to identify and measure the relationship between international degree and supply chain resilience.

In the Guiding Opinions on Actively Promoting Supply Chain Innovation and Application, it is pointed out that the development of supply chain is incorporated into the national strategic pattern. It is also clearly put forward that supply chain financial institutions should be actively and steadily constructed and developed. Supply chain financial platforms should be actively constructed as well to expand investment and financing channels. Meanwhile, the development trend of internationalization of trade also requires the financial market to offer high-quality and innovative supply chain financial services and products. China Banking and Insurance Regulatory Commission (CBIRC) also encourages banks and other financial institutions to provide SCF and other related services for many small and medium-sized enterprises (SMEs) on the upstream and downstream in the supply chain. In view of the constraints of SMEs' low credit scores and high financing costs in commercial behavior, it is suggested that banks should improve their service level and capacity in all aspects to take the core enterprises of the supply chain as the carrier, deeply integrate the types of services, and improve the quality of services. In recent years, the government has also introduced relevant policies to fully support the development of SCF and boost the efficient development of enterprises.

This paper constructs the integrated business performance index of NEV enterprises through entropy weight method, and studies the influence of SCF on the comprehensive business performance of enterprises by constructing a fixed effect model. At

the same time, this paper introduces the "financing constraint" to explore the mechanism of SCF affecting the comprehensive performance of enterprises. In the mechanism analysis part, this paper innovatively introduces Zhang Ting's parsimonious two-step method of mediation effect. This improves a new research method idea for the mechanism research of SCF on the comprehensive business performance of enterprises.

2 Literature Review

SCF aims to harmonize material flows, information flows, capital flows, and funding flows. It has become a "key term" among academics and practitioners, denoting the planning, guidance and control of capital flows along the supply chain [1]. The concept of SCF has received extensive attention from the business community, academia and government since its introduction [2, 3]. Currently, research related to SCF is divided into two main genres: financial supply chain management and trade credit [4, 5]. In the literature, financial supply chain management is used as an umbrella term focusing on supplier-buyer relationships and cash flows in parallel with physical and information flows [1]. The finance literature on short-term SCF mainly revolves around trade credit [6], and there is a significant overlap between its literature on trade credit and short-term SCF [4]. Chakuu et al. [5] argue that despite the importance of SCF, research on it is still at a relatively preliminary stage.

The performance evaluation of SCF is an important way to show the effectiveness of supply chain operation. Researchers usually use this way to show the importance of SCF development, and with the progress of research, the advantages of SCF model compared with the traditional financing methods can be shown more clearly through the data. Gunasekaran et al. [7] believe that the further deepening of supply chain performance evaluation can effectively help to develop more efficient supply chain. They believe that a deeper assessment of supply chain performance can effectively help develop a more efficient supply chain, and suggest that the financial indicators of the trade order program and the chain partnership should be selected as the indicators to establish a corresponding framework, and use this framework to measure the supply chain performance. Pourvasei et al. [8] studied the evidence of companies listed on the Tehran Stock Exchange, compiled five hypotheses, conducted a statistical study, and confirmed the relationship

between SCF and companies' financial performance. That confirmed the existence of a link between SCF and the financial performance of companies. WetzelP et al. [9] investigated the path of the impact that the limited capital of the core firms would have on the operational performance of the firms throughout the supply chain, from WCM to exploratory empirical tests, affirming the existence of a relationship between SCF operations and financing constraints of the firms, as well as the firms' performance.

Since the end of the 20th century, SCF, which has attracted much attention in the business innovation of commercial banks, has experienced the evolution of financial supply chain management to SCF business in China. China's domestic SCF on enterprise performance has also gradually deepened the problem. Zhang et al. [10] pointed out that SMEs as the vulnerable parties more likely to face financial problems. Take the advantages of SCF can have a positive impact on enterprise performance, effectively increase the stability of the supply chain and improve the efficiency of the supply chain. Though there is no perfect authoritative statement on the establishment of the evaluation index system of SCF on enterprise performance, on the basis of summarizing the literature and supply chain operation model, it is pointed out that by evaluating from the multiple perspectives of overall reliability, flexibility, responsiveness, cost, and asset management, SCF can have a positive impact on the significant improvement of the financial performance of the enterprise, and cost and risk impact have a negative impact on the improvement of the performance of the enterprise. Zhang et al. [11] combined the balanced scorecard and hierarchical analysis method to conduct a questionnaire survey on SMEs in the supply chain, collected enough data, and analyzed the conclusions to prove that the SCF model alleviates the difficulty of SMEs' financing to a certain level, and provides a new profit growth point and profitability opportunity for the banks to carry out supply chain financial services. Zhu [12] believes that the EVA performance evaluation method is more efficient compared to the study of traditional financial indicators, so it is empirically demonstrated from the perspective of EVA, which points out feasible suggestions for enterprises to comprehensively improve the efficiency of financing. Using an empirical method, Han [13] verified that SCF business can improve the performance of enterprises in need of financing, and at the same time, the accuracy and timeliness of information become an

important factor in the mutual advancement between SCF business and enterprise performance. Zheng et al. [14] divided enterprise performance evaluation into three categories, customer indicators, financial indicators and business indicators. Adopting the method of AHP, in fact, when SMEs apply the model of SCF model in their business, they should adhere to the idea of customer interests first and improve the efficiency of relevant personnel within the enterprise in the application of SCF model in all aspects. Luo [15] respectively analyzed the compare from multiple perspectives, of uses the financing performance of SMEs in need of financing with SCF, with the impact of the bank's financing performance through borrowed funds. Li et al. [16] from the perspective of sustainability SCF, through empirical analysis of the results show that from the economic, environmental and social levels of the three macro-levels, the supply of finance can enhance the financial performance of enterprises in the supply chain. In turn, those three dimensions can also promote the SCF service level and enterprise performance of the positive feedback relationship between the three dimensions.

3 Empirical analysis of the impact of SCF on the development of automobile enterprises

3.1 Research Hypothesis

SCF can significantly improve the operational efficiency of automobile manufacturing enterprises and their supply chain partners by optimizing resource allocation and enhancing information integration. This not only promotes efficient production and sales activities, but also helps companies improve profit levels and reduce operating costs. In the event of external shocks such as the New Crown Pneumonia epidemic, the credit support provided by SCF to enterprises ensures the stable operation of the supply chain and optimizes the efficiency of capital flow, thus positively affecting the financial position of enterprises.

Although the implementation of SCF may increase the short-term debt level of enterprises, from a long-term perspective, it helps to reduce financial risks and improve the financial performance of enterprises by enhancing the stability of the supply chain and alleviating the financing constraints of enterprises. Therefore, it can be expected that SCF activities will have a positive effect on corporate financial performance.

In view of the above analysis, this study proposes the

following hypotheses:

Hypothesis 1: SCF activities can significantly improve SCORE. This hypothesis is based on the view that SCF promotes enterprise cost reduction and sales efficiency by improving supply chain efficiency and optimizing resource allocation.

Hypothesis 2: SCF affects firms' comprehensive performance (SCORE) by alleviating firms' financing constraints (FC).

3.2 Sample Selection and Data Sources

Based on the industry classification standard issued by China Securities Regulatory Commission, this article selects industrial companies in China's automobile industry as the research object. In particular, the automobile manufacturing companies in China's listed companies were selected for this study. The research data sample covers the annual report data of these companies from 2000 to 2021. In order to ensure the practicality of data selection and the stability of empirical analysis results, this study adopts the following principles to screen the corporate data:

1. Exclude the sample data of ST and *ST enterprises.
2. Excluding samples of enterprises with missing data.

After the above screening, a total of 1594 annual observations are obtained. These data were mainly obtained from the Vantage database.

The main tool used in this study for data processing is the Python programming language, especially its libraries related to scientific computing and data analysis. Python as a powerful data analysis tool, provides a wide range of libraries and functions that support efficient data processing and statistical analysis. This study focuses on using Python for data cleaning, processing, and performing the necessary statistical analysis and modeling to ensure the accuracy and efficiency of the analysis.

3.3 Variable Selection

3.3.1 Explained variable

Integrated Business Performance(SCORE): A comprehensive assessment of financial performance is essential to reveal the effectiveness of corporate strategy execution. In the field of research on the relationship between SCF and financial performance, scholars tend to use a single financial indicator as a tradition, such as return on equity (ROE) or Tobin's Q, to measure financial performance.

Table 1. Indicators for evaluating the financial performance of an enterprise

Category	Indicator name	Formula
profitability	Return on Total Assets	Net Profit/Total Assets
	Return on Equity	Net Income / Average Shareholders' Equity
Operating ability	Operating Profit Margin	Operating Profit/Revenue
	Total Assets Turnover Ratio	Sales/Total Assets
solvency	Inventory Turnover Ratio	Operating Cost/Average Inventory Balance
Development capacity	Gearing ratio	Opposite of total liabilities/total assets
	Operating profit growth rate	Current operating income/previous operating income -1
	Net profit growth rate	Net profit for the period Net profit for the previous period -1

However, the limitation of this single-indicator approach is that it may not be able to fully reflect a firm's financial position, thereby increasing the contingency of the research results. Therefore, a more comprehensive indicator for assessing financial performance, integrated business performance F, is used in this study.

(1) Introduction to Financial Indicators In this study, nine key indicators are selected from four main financial capability dimensions, namely profitability, operating capability, solvency and development capability, in order to comprehensively evaluate the financial performance of enterprises. These indicators not only cover the overall performance of an enterprise in the SCF environment, but also provide a comprehensive perspective to understand the financial situation of an enterprise. The following Table 1 detailed the selected indicators and their calculation formulas:

(2) Construction of Comprehensive Financial Performance Indicator Indicators Based on Entropy Weight Method In order to more accurately measure the financial performance of enterprises and ensure the fairness and scientificity of the evaluation results, this study adopts the entropy weighting method to process the selected financial indicators. Entropy weight method is an objective assignment method, which can effectively utilize the information of the data itself to determine the weight of each indicator and reduce the influence of human factors on the evaluation results. The main steps of entropy weight method are as follows:

1) Data pre-processing: first, use Excel software

Table 2. Descriptive statistics of the raw data of the entropy weighting method

Variable	Obs	Mean	Std. dev.	Min	Max
NPG	884	-0.307981	7.904151	-83.53232	94.18142
OPG	884	-0.071005	13.95025	-95.82993	252.1626
ITR	884	5.360773	4.477675	0.758452	39.59534
TATR	884	0.6640637	0.2493027	0.084662	1.830654
OPM	884	0.0834426	0.092555	-1.592448	0.381819
DAR	884	0.4555001	0.1637203	0.074009	0.956045
ROA	884	0.046164	0.0446148	-0.713917	0.199367
ROE	884	0.0450434	0.5572713	-18.56893	0.781275
SCF	884	0.1591375	0.1001041	0.0001209	0.6350674

to organize and pre-process the collected data of each financial indicator, including data cleaning and normalization.

2) Calculate the information entropy of the indicators: Measure the importance of each indicator in the comprehensive evaluation by calculating its information entropy. The smaller the information entropy is, the greater the difference of the indicator is and the greater the contribution to the comprehensive evaluation.

3) Determine the weight of indicators: According to the calculated information entropy, the entropy weight method is used to determine the weight of each indicator. In this way, the role of each indicator in the comprehensive financial performance evaluation is quantified.

4) Calculate the comprehensive financial performance index: finally, according to the determined weights and the values of each indicator, the comprehensive financial performance index of the enterprise is calculated.

As shown in Table 2, we derive the comprehensive financial performance indicators for measuring the financial performance of the enterprise.

3.3.2 Core explanatory variable

Supply chain finance (SCF): The quantification of SCF development level has a variety of mainstream definitions in academia. This study, after in-depth discussion, chooses a more comprehensive and suitable quantification of the characteristics of the automotive industry. Currently, scholars' methods for measuring SCF are mainly categorized into three:

Macroeconomic indicator method: For example, scholars such as Zhang Weibin and Liu Ke [17] select macroeconomic indicators such as national short-term loans and national bill posting to measure

SCF. although this method fits with the three financing modes of *SCF*, there are limitations in the way it uses macroeconomic indicators as a way to measure the level of *SCF* of micro-individuals of enterprises.

Core Enterprise Guarantee Model Approach: Han Min and Gao Xuxi [18] quantify *SCF* based on the "M+1" model of *SCF* by whether the core enterprises provide credit guarantees for SMEs. Although this approach is close to the definition of *SCF*, it is difficult to obtain reliable data because the enterprise guarantee information is not publicly disclosed in the annual report. reliable data.

Enterprise statement item method: This study adopts the method of Yao Wangxin and Xia Tingting [19] et al. to measure the level of development of *SCF* through the ratio of the enterprise's notes payable and short-term borrowing to total assets. This method can comprehensively and dynamically reflect the development of *SCF* and corresponds to the three modes of *SCF*, which is highly relevant.

3.3.3 Control variables

In order to enhance the persuasiveness of the study and ensure the objectivity of the model predictions, this paper synthesizes and organizes the literature related to automobile enterprises, *SCF* and financial performance, and selects the following control variables:

Firm size (SIZE): The natural logarithm of the firm's total assets is chosen to measure the firm's size, and in this way, it reflects the impact of the firm's market share, financing ability and technological innovation on financial performance.

Cost of Expense Ratio (CER): Low cost-to-income ratio usually means that the company is able to effectively control costs and improve operational efficiency. This will help the company to enhance profitability, strengthen competitiveness, and ultimately improve overall performance.

Return on Assets (ROA): There is a close relationship between return on assets and the comprehensive performance of enterprises. In general, a high return on assets will help to improve the overall performance of the company, as it indicates efficient use of assets to generate profits. A higher ROA reflects the company's ability to convert investments into earnings, thereby enhancing its financial health and competitiveness in the market.

Enterprise Fixed Asset Ratio(FAR): The fixed asset

Table 3. Variables

Variable	Name	Notation	Calculation Method
Dependent Vayiable	Integrated Business Performance	SCORE	Obtained by the entropy weight method
Explanatory variable	Supply Chain Finance Level	SCF	(Accounts receivable + short-term borrowings) /total assets
Control Variable	Asset Size	SIZE	Natural logarithm of total assets for the year
	Operating Cost Ratio	CER	Operating Costs/ Operating Income Profit/Total Assets
	Return on Assets	ROA	Fixed Assets/Revenue
	Fixed Asset Ratio	FAR	Fixed Assets / Total Assets
Intermediary variable	Financing constraints	FC	t cash and cash equivalents change / (t -1) total assets

ratio of a company refers to the ratio of total fixed assets to total assets, reflecting the structural characteristics of asset allocation in the company. There is a close relationship between the fixed asset ratio and the overall performance of the company.

3.3.4 Intermediary variable

Financing constraints (FC):By utilizing *SCF*, businesses can effectively alleviate financing constraints, enhance capital utilization efficiency, optimize supply chain collaboration, thereby increasing overall corporate performance (*SCORE*). As shown in Table 3.

3.4 Model Building

Based on the previous hypotheses, we identified the fixed-effects model as a more appropriate model for assessing the impact of *SCF* on corporate financial performance by comparing the key statistical indicators of the fixed-effects model and the random-effects model. The fixed-effects model demonstrated higher R-squared values and F-statistics, indicating that it is more capable of explaining data variability.

The model is constructed as follows:

$$SCORE_{i,t} = \beta_0 + \beta_1 SCF_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 CER_{i,t} + \beta_4 ROA_{i,t} + \beta_5 FAR + \epsilon_{i,t} \quad (1)$$

Where, $SCORE_{i,t}$ represents the comprehensive financial performance, β_0 represents the constant term, $\beta_i (i = 1, 2, 3, 4, 5, 6, 7)$ is the regression coefficient of the model, ϵ_{it} is the random error term. If the coefficient β_1 of $SCF_{i,t}$ is significantly greater than

Table 4. Describe the Results of the Statistical Analysis

Variable	Count	Mean	Std	Min	Max
SCORE	884	0.06369	0.03980	0.02181	0.90310
SCF	884	0.15913	0.10010	0.00012	0.63506
FC	506	0.14839	0.15805	0.00391	2.56045
ROA	884	0.04616	0.04461	-0.7139	0.19936
CER	884	0.78362	0.07816	0.40713	0.94230
SIZE	762	22.5460	1.42069	18.8060	27.6210
FAR	884	0.22762	0.09819	0.00597	0.54891

zero, it means that *SCF* helps to improve the financial performance of enterprises, and the hypothesis of the previous section is valid.

3.5 Descriptive Statistical Analysis

We have conducted an in-depth discussion on the relationship between *SCF* and *SCORE* in new energy vehicle enterprises. Descriptive statistics were performed for various variables from the perspective of mean, standard deviation, minimum and maximum values, as shown in Table 4.

In analyzing the descriptive statistics of the 884 samples from the new energy automobile industry, we found a significant positive relationship between *SCF* and *SCORE*, where the mean level of *SCF* is 0.15913 and the standard deviation is 0.1, indicating that there are some differences in the degree of participation and depth of new energy automobile enterprises in utilizing *SCF*. This difference may reflect the different degree of awareness and application of *SCF* among enterprises, some of which may be more active in using *SCF* to optimize capital flow and reduce operating costs.

Meanwhile, the mean value of *SIZE* is 22.546 with a standard deviation of 1.42, indicating that the enterprises in the sample differ significantly in size, which implies that enterprises in the new energy automobile industry range from small to large enterprises, and larger enterprises may be able to diversify risks and improve efficiency through economies of scale.

The results of the analysis of financial leverage and operating cost ratio further confirm the diversity of firms in terms of financial management strategies and cost control. In particular, the analysis of return on total assets reveals significant differences in the efficiency of asset utilization across enterprises, reflecting the varying efficiencies in asset management and utilization, some of which may have achieved better financial performance through more efficient

asset management.

Differences in operating revenue growth rates and operating gross margins, on the other hand, reveal the instability of revenue growth and fluctuations in the profitability of the main business of the enterprises, further emphasizing the competition within the new energy automobile industry and the complexity of the market environment.

Overall, these descriptive statistics provide valuable information for an in-depth understanding of the financial situation of new energy vehicle enterprises and the current status of *SCF* application, emphasizing the significant differences in size, financial leverage utilization, cost control and profitability among enterprises within the industry, and the possible impact of these differences on the financial performance of enterprises.

3.6 Analysis of Regression Results

Regression analysis based on data from 884 samples in the new energy automobile industry. The model takes into account important control variables such as firm size, gearing ratio, and operating cost ratio to ensure the accuracy and reliability of the results. Below are the detailed results of the regression analysis:

From Table 5, we find that *SCF* has a positive effect on *SCORE* regardless of whether a control variable is added. In addition, the effect of *SCF* on *SCORE* was positive regardless of the time effect. This result may indicate that *SCF*, as a financial innovation tool, can improve the resource utilization efficiency and market competitiveness of enterprises, which in turn promotes the improvement of enterprise financial performance, which proves that our hypothesis is correct.

3.7 Empirical analysis of the effect mechanism for *SCF* on *SCORE*

3.7.1 Intermediary effect test

Because Wen the three-step method of Zhongliang [20] has the suspicion that over-testing results in endogeneity, so this paper will use two-step method of Jiang ting [21]. The test results are shown in Table 6.

$$SCORE_{it} = \alpha_1 + \beta_1 SCF_{it} + \sum \lambda_{ij} control_{itj} + \epsilon_1 \quad (2)$$

$$FC_{it} = \alpha_2 + \beta_2 SCF_{it} + \sum \lambda_{ij} control_{itj} + \epsilon_2 \quad (3)$$

Among them, FC_{ij} is the intermediary variable and $Control_{ij}$ is the control variable. Firstly, the equation (2) is estimated. The effect of *SCF* on *SCORE* is examined, and the regressive coefficient reflects the

Table 5. Baseline regressions results

	(1)SCORE	(2)SCORE	(3)SCORE
SCF	0.0307** (2.30)	0.0486*** (5.51)	0.0484*** (5.45)
ROA	-	0.0384** (1.97)	0.0345* (1.73)
SIZE	-	0.0102*** (15.73)	0.0103*** (15.75)
FAR	-	-0.0312*** (-3.34)	-0.0315*** (-3.36)
Constant	0.0588*** (23.44)	-0.169*** (-10.79)	-0.170*** (-10.81)
Year	Yes	No	Yes
N	884	762	727

total effect of *SCF* on *SCORE*. Then, the equation (3) is estimated. The relationship between the intermediary variable *FC* and *SCF* is studied, and the regression coefficient β_2 reflects the impact of digital inclusive finance on the intermediary variable.

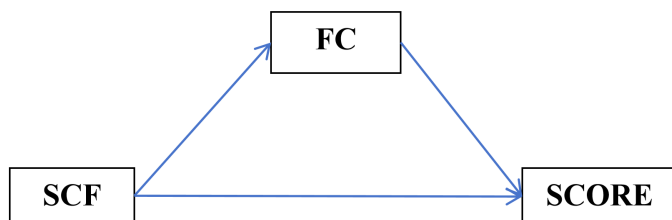


Figure 1. Intermediary effect diagram.

The test method is as follows: the regression coefficient β_1 and β_2 of the equation (2) and the equation (3) are tested respectively for significance. If all the tests have been passed, it means that the intermediary variable plays an intermediary effect, otherwise there is no intermediary effect.

3.7.2 Analysis of empirical results

The results of the intermediary effect test are shown in Table 6. Table 6 shows that *SCF* affects *SCORE* by relieving *FC*. At the same time, from Table 6, the development of *SCF* will inhibit *FC* and thus affect the *SCORE*. This is consistent with the previous analysis.

Table 6. Baseline regressions results

	(1)FC	(2)SCORE
SCF	-0.171** (-2.31)	0.0308*** (3.44)
ROA	0.0112 (0.07)	0.0766*** (3.78)
CER	-0.0787* (-0.73)	0.0969*** (7.06)
SIZE	0.00235 (0.42)	0.00808*** (11.50)
FAR	-0.465*** (-6.34)	-0.0247*** (-2.70)
Constant	0.290** (2.25)	-0.198*** (-12.55)
Year	Yes	Yes
N	506	762

4 Conclusion and Suggestion

4.1 Conclusion

This study thoroughly explores the application of *SCF* in NEVs industry and its impact on corporate financial performance, revealing some enlightening findings. As a matter of fact, *SCF*, as an innovative financing model, is not only a theoretical concept, but also shows strong vitality and potential in practice, especially for such a dynamic and rapidly developing industry as new energy automobile.

First, the implementation of *SCF* has significantly improved the financial performance of companies. This finding is not only good news for those NEV enterprises that are seeking transformation and upgrading, hoping to improve their financial situation through innovative models, but also provides new ideas for those enterprises that have encountered bottlenecks in improving their financial performance. It is like a spring breeze that brings hope and motivation for enterprises to grow.

Secondly, this finding has a value for policy makers that cannot be underestimated. In the current global context of promoting green energy and accelerating the development of NEV industry, the successful practice of *SCF* provides a new direction for policy support. It not only helps the government and related organizations to formulate support measures more

precisely and promote the healthy growth of the new energy automobile industry, but more importantly, it provides valuable reference on how to support industrial upgrading through financial innovation.

4.2 Suggestion

1. Suggestions to the government and regulators. In the context of the increasingly vigorous development of *SCF*, China's government and regulatory agencies should accelerate the process to further improve the laws and regulations related to *SCF*, and lower the threshold for enterprises, especially SMEs, to enter the *SCF* market. At the same time, under the premise of maintaining the stable development of the market, increase the policy support for the new energy automobile industry, encourage more financial institutions to participate in it, and provide more low-cost and high-efficiency financing services for SMEs in the supply chain.

2. Suggestions for enterprises in the NEV industry. In the foreseeable future development process, enterprises should firmly grasp the opportunities for the development of *SCF*, make full use of China's government preferential and supportive policies for SME financing, and cooperate with financial institutions in the supply chain. Both SMEs and core enterprises in the ever-changing development of technology, should be encouraged to explore new modes, actively embrace *SCF*, the use of better technology, and optimize their own financial management and supply chain management. In particular, core enterprises should not only stay ahead of the times, but also help upstream and downstream SMEs solving financing problems by establishing a good *SCF* ecosystem, so as to enhance the operational efficiency and competitiveness of the entire supply chain.

3. Suggestions for Financial Institutions. At present, China attaches great importance to the development of *SCF*, many local governments have introduced corresponding policies, and major banks have also continuously responded to the needs of the market and the country's call to launch their own supply chain financial products. And along with the development of *SCF*, a number of new *SCF* platforms have emerged one after another, developing new and innovative *SCF* products for the market needs.

Financial institutions should increase their investment in the *SCF* business of the NEV industry and utilize advanced financial technology, such as blockchain

technology, to improve the efficiency and security of financing services. At the same time, through in-depth cooperation with industry enterprises, they should develop financial products and services that are more in line with the characteristics of the NEV industry to meet the diversified financing needs of enterprises.

Conflicts of Interest

The authors declare no conflicts of interest.

Funding

This work was supported by the Project of Educational Science Planning of Guangdong Province under grant number 2022GXJK085 and the School-level Research Project of the Software Engineering Institute of Guangzhou under grant number KY202307.

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