



Slack Resources and Corporate Supply Chain Resilience: An Empirical Study Based on A-share Listed Companies

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Abstract. Against the background of the profound changes unseen in a century, emergencies occur frequently, and the enterprise supply chain suffers from the attack of disruption risk. How to improve the supply chain resilience has become a key concern of enterprises and the state. Based on the perspective of Resource-based View, this paper takes A-share listed companies in China from 2011 to 2022 as a research sample to explore the intrinsic relationship between different types of slack resources and corporate supply chain resilience, and the results show that: unabsorbed slack resources significantly promote the enhancement of corporate supply chain resilience, while absorbed slack resources dramatically inhibits supply chain resilience. The results enrich the researches on supply chain resilience, help enterprises objectively recognize the impact of different types of slack resources on their supply chain resilience, and provide new paths for enterprises to enhance their supply chain resilience.

Keywords: unabsorbed slack resources; absorbed slack resources; supply chain resilience

1 Introduction

In the face of the resistance of economic globalization, the intensification of geopolitical conflicts and the profound changes in the global governance system, the stability and reliability of supply chains have been subjected to unprecedented scrutiny. Under the combined effect of these factors, the vulnerability and risk of disruption of supply chains have become increasingly prominent, posing a serious threat to the operation and development of enterprises and even entire economies. In this context, ensuring the resilience and security of the industrial chain supply chain has become an important initiative to promote the high-quality development of the economy. The performance and enhancement of the resilience of the enterprise supply chain, as the micro subject of the national development of the industrial chain supply chain, has become an important practical issue¹.

In order to cope with the increasingly obvious risk of supply chain disruption, enterprises will be more inclined to accumulate more slack resources to cope with unexpected events. The use of slack resources to coordinate upstream and downstream relationships in the supply chain and to help enterprises make rational supply chain

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configuration is one of the important means. However, it is still controversial how different types of slack resources affect the resilience of enterprise supply chain. Based on this, this paper takes the enterprise supply chain resilience as the research object and explores the impact of different types of slack resources on supply chain resilience.

2 Theoretical Analysis and Research Hypotheses

The Resource-based View emphasizes that the organization's slack resources can support the transformational development of the enterprise and alleviate the pressure of resource constraints². Cyert and March found that supply chains can utilize internal absorbed resources to cope with the impacts of environmental changes³. Therefore, operational relaxation and supply chain slack resources are also considered by scholars as important means to enhance the supply chain resilience of enterprises.

According to Resource Redundancy Theory, organizational slack resources can be divided into unabsorbed slack resources and absorbed slack resources. Absorbed slack resources refer to the slack resources that have been embedded in the current business of an enterprise but exceed the existing current requirements, including slack human resources, machinery and equipment, plants, etc., which are mainly characterized by poor mobility; unabsorbed slack resources refer to the idle resources that have not been utilized in the enterprise operation, as represented by the cash flow. Unabsorbed slack resources are mainly characterized by strong liquidity and can be quickly utilized, and are an important guarantee for the enterprise to cope with the crisis.

Unabsorbed slack resources and supply chain resilience

Unabsorbed slack resources represented by cash flow is highly flexible and adaptable, which can provide financial support for enterprises to quickly adapt to changes in the market environment⁴. At the same time, unabsorbed slack resources can be quickly rearranged. When the enterprise faces unexpected events leading to increased risk of supply chain disruption, unabsorbed slack resources can help the enterprises to carry out resource reorganization, business adjustment, and maintain the stability of the capital chain⁵, in order to maintain the continuity and stability of the supply chain. Therefore, this paper argues that enterprises' unabsorbed slack resources can enhance supply chain resilience. In view of this, this paper proposes the following hypotheses:

H1: There is a positive relationship between unabsorbed slack resources and supply chain resilience.

Absorbed slack resources and supply chain resilience

Compared to unabsorbed slack resources, absorbed slack resources are usually closely related to specific business processes or products, with high adjustment costs and slow response times. When the market or supply chain environment changes, absorbed slack resources may not be able to adapt to new requirements in a timely manner, resulting in wasted resources and decreased efficiency. In addition, over-reliance on absorbed resources may reduce the organization's adaptability and flexibility to new situations, thus weakening the resilience of the supply chain. In view of this, this paper proposes the following hypotheses:

H2: There is a negative relationship between absorbed slack resources and supply chain resilience.

3 Research Design

3.1 Sample Selection

In this paper, China's A-share listed companies are selected as the research sample from 2011 to 2022, and their sample data are processed with the following processing steps: (1) insurance and financial enterprises are excluded from the sample selection in this paper; (2) listed enterprises in the ST category and the ST* category are excluded; (3) data of enterprises listed in the current year are excluded in order to ensure the reliability of the data; (4) enterprises with incomplete data of the key variables are removed; (5) to avoid the influence of outliers on the results, all selected continuous variables selected are subjected to a 1% two-sided shrinkage treatment. enterprises. After the above sample screening, a total of 15,174 valid data were finally obtained.

3.2 Variable Settings

Variable Settings, Explained variable: supply chain resilience (Resil). Supply chain resilience itself is difficult to measure, this paper uses supply chain concentration as a proxy variable to measure supply chain resilience. Based on the existing research, this paper measures the supply chain concentration of agent variable with the average of the purchasing proportion of the top five suppliers and the sales proportion of the top five customers in the year. The higher the degree of concentration, the higher the degree of monopolization, the worse the toughness; the lower the degree of concentration, the lower the degree of monopolization, the better the toughness.

Explanatory variable: slack resources. Slack resources include unabsorbed slack resources (US) and absorbed slack resources (AS). According to the measure of absorbed slack resources, existing research is generally based on financial data for indirect measurement, this paper draws on the ratio of administrative expenses to the sales revenue in the same period of time as a proxy variable for precipitating slack resources. Taking the importance of cash flow to the enterprise supply chain, this paper adopts "cash and cash equivalents / (total assets - cash and cash equivalents)" to measure unabsorbed slack resources.

Control Variables: Referring to the related literature, this paper selects firm size (Size), gearing ratio (Lev), operating income growth rate (Growth), top ten shareholders' shareholding ratio (TOP10), and the number of years of establishment (FirmAge) as control variables.

3.3 Model Construction

In order to test the impact of slack resources on enterprise supply chain resilience, this paper establishes the following benchmark model:

$$Resil_{i,t} = \alpha_0 + \alpha_1 US_{i,t} / AS_{i,t} + \sum Controls_{i,t} + \epsilon_{i,t}$$

In the above benchmark model, *i* represents the sample enterprise, *t* represents the year, *Resil_{i,t}* represents the supply chain resilience of the enterprise in Year *t*, explanatory variable *US_{i,t}* represents the unabsorbed slack resources of the enterprise in *t* years, *AS_{i,t}* represents the absorbed slack resources of the enterprise, $\sum Controls$ represents a set of control variables related to the supply chain resilience of the enterprise.

3.4 Descriptive Statistics

As shown in Table 1, the average value of absorbed slack resources in the sample listed companies is 0.0893, indicating that absorbed slack resources in the sample companies is relatively small; The minimum value is -0.111, and the maximum value is 7.284, indicating a significant difference in the absorbed slack resources among the sample enterprises. The overall situation of unabsorbed slack resources is similar to that of absorbed slack resources. In terms of supply chain resilience, the average value is 32.22, the minimum value is 2.28, and the maximum value is 108.1, indicating that the sample enterprises have significant differences in supply chain resilience levels and the overall supply chain resilience level is relatively high.

Table 1. Descriptive statistics

Variables	(1) N	(2) Mean	(3) Sd	(4) Min	(5) Max
AS	15,174	0.0893	0.0960	-0.111	7.284
US	15,174	0.198	0.243	0.000480	6.900
Size	15,174	22.24	1.152	19.58	26.45
Lev	15,174	0.416	0.191	0.0349	0.908
Growth	15,174	0.159	0.393	-0.658	4.024
Top10	15,174	54.86	14.38	20.84	90.97
Age	15,174	2.308	0.561	1.099	3.401
Resil	15,174	32.22	15.96	2.280	108.1

4 Empirical Analysis

In Table 2 column (2), it is observed that the regression coefficient of absorbed slack resources (AS) is -11.541 and passes the statistical test at 1% level of significance. This implies that when absorbed slack resources are raised by 1%, the firm’s supply chain resilience is correspondingly weakened by 11.541%. Thus, the hypothesis one is verified that there is a negative relationship between absorbed slack resources and supply chain resilience, and the weakening effect is obvious. Similarly, In Table 2 column (3), it is observed that the regression coefficient of unabsorbed slack resources (US) is 2.666 and passes the statistical test at 1% level of significance. This implies that when unabsorbed slack resources are raised by 1%, the firm’s supply chain resilience is correspondingly reinforced by 2.666%. Thus, the hypothesis two is verified that there is a

positive relationship between unabsorbed slack resources and supply chain resilience, and the enhancement effect is obvious.

Table 2. Empirical analysis results

	(1) Resil	(2) Resil	(3) Resil
AS		-11.541*** (-4.031)	
US			2.666*** (-0.867)
Size	-2.401*** (-0.522)	-2.554*** (-0.524)	-2.468*** (-0.523)
Lev	0.440 (1.433)	0.520 (1.428)	1210 (1.459)
Growth	1.362*** (0.274)	1.102*** (0.283)	1.347*** (0.273)
Top10	-0.033 (0.022)	-0.032 (0.022)	-0.034 (0.022)
Age	-1.232 (1.064)	-1.441 (1.066)	-1.058 (1.067)
Constant	88.527*** (10.798)	93.148*** (11.024)	88.795*** (10.812)
N	15174	15174	15174
R2	0.022	0.025	0.024

Note: ***, ** and * indicate significant at the 1%, 5% and 10% levels respectively.

5 Conclusions and Implications

This paper analyzes the data of listed enterprises in the past ten years to explore the intrinsic relationship between different types of slack resources and supply chain resilience from the perspective of slack resources. The results show that the increase of unabsorbed slack resources can significantly enhance the supply chain resilience of enterprises, while the increase of absorbed slack resources can significantly weaken the supply chain resilience of enterprises, and the effect is significantly stronger than that on unabsorbed slack resources.

Through the study of this paper, the following insights are obtained: firstly, enterprises should pay attention to the impact of slack resources on their own supply chain; secondly, enterprises should ensure the sufficiency of their own non-sedimentary slack resources to ensure the continuity and stability of the supply chain under the background of the turbulent market; lastly, the absorbed slack resources will significantly weaken the resilience of the enterprise's supply chain. Therefore, enterprises should rationally utilize fixed resources in business projects to avoid the accumulation of slack resources and the increase of operating costs and fixed costs.

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