

## Research Article

# An Empirical Analysis of the Correlation between Listed Companies' Financial Shared Services and Corporate Innovation Performance: Based on the Empirical Data of A-Share Listed Companies

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With the rapid development of information technology, the financial sharing service is a new type of financial management that saves human capital, changes management concepts, improves management efficiency, and improves the internal control environment by centralizing the simple and repetitive work of enterprises. Financial shared services will strengthen the innovation capabilities of enterprises in terms of financial personnel, management personnel, and internal control environment. Therefore, in order to explore whether the new management model of financial shared services can bring about an improvement in the level of corporate innovation, this article starts from the perspective of financial shared services, takes A-share listed companies as the research sample, and uses the DID regression model to empirically analyze the relationship between financial shared services and the correlation between corporate innovation performance. The results of the research show that implementing financial sharing service can significantly improve enterprise innovation performance.

## 1. Introduction

The famous political economist Schumpeter first proposed the concept of “innovation” in his book “Theory of Economic Development” published in 1912 and pointed out the important role of innovation in economic development. In today’s increasingly fierce market competition, more and more companies realize that innovation ability is the main source of long-term development and core competitiveness in a fierce market and raise it to a strategic level. The 19th National Congress of the Communist Party of China once again emphasized the role of innovation in economic development. It proposed that “innovation is the first driving force for development and the strategic support for building a modern economic system.” Exploring the influencing factors of corporate innovation capabilities and digging out corporate innovation footholds have gradually

become the focus of attention in the theoretical and practical circles.

With the rapid development of enterprise scale, the problem of business duplication in enterprise business processes has begun to appear. These simple and repetitive businesses are difficult to handle in accordance with unified standards. Enterprises need to invest a lot of human resources to complete these tasks with low value and creativity. This has caused a huge waste of human resources and low management efficiency. The advantage of financial shared service is that it can realize business process reengineering by centrally processing some complex and repetitive business processes of the enterprise, making business processing more refined and standardized. The 2018 Financial Shared Services Survey Report released by the National Accounting Institute shows that as of 2018, more than 70% of large Chinese companies have begun to implement financial shared services, and more than 54.76% have established internal financial shared services, and

financial shared services have been established. More than 42.86% are included in corporate strategic planning, and only 2.38% of medium-sized companies have not implemented financial shared service plans. These data have fully shown that financial shared services have fully entered China.

Although innovation plays a vital role in the development of enterprises, different stakeholders have completely different attitudes towards innovation. The reason is that although innovation activity is a high-yield and high-return activity, it is also an activity with high risk, high investment, and high uncertainty. There are differences in different stakeholders' attitudes towards risks and returns; some prefer high risk and high return, but others are risk-averse. For example, investors tend to improve company's innovation ability in order to get high returns; managers do not participate in the distribution of residual rights and interests, so they do not want to take the risks of innovation. Therefore, if an enterprise wants to invest more in innovation activities, it should allow the different stakeholders of the enterprise to accept the importance of enterprise innovation and establish a strategic goal to enhance the innovation capability of the enterprise. Financial shared services, a new management model that emerged with the development of information technology, provide employees with more time for innovative activities by efficiently and centrally processing the simple and repetitive tasks of the company. At the same time, the new management model will manage the company. The environment and management efficiency have important impacts. The construction of financial shared services will have an important impact on corporate innovation activities. At present, there is no relevant research on the level of corporate innovation and financial sharing in academic circles at home and abroad. Most of the research on financial sharing focuses on case studies, and most of them focus on the research of financial sharing on reducing corporate costs and improving management efficiency. This article innovatively takes the impact of financial shared services on corporate innovation as the main research point, uses empirical analysis to test the correlation between the two, filling the gap in this research field and, at the same time, seeking ways for companies to improve their innovation capabilities, and provides new ideas.

## 2. Research Status at Home and Abroad

The concept of shared services was first proposed by Moller [1], who believed that when the enterprise organization structure is large, the business should be handled by establishing a shared service center. The application of shared services in the financial field has formed financial sharing. Reglana [2] defines financial sharing as an independent business unit established by an enterprise according to its own management level and business requirements to provide basic services for the enterprise as a whole, thereby improving the management of the enterprise level. Ma and Li [3] believe that the establishment of financial-sharing-related services by enterprises can help improve financial efficiency and internal control efficiency. Sun and Liu [4] pointed out that with the rapid development of "Internet +," powerful information technology has overturned the traditional financial management model. The

establishment of financial sharing services can make the division of work between finance and accounting more refined, standardized, and highly synergistic, saving resources and reducing the total cost of the enterprise. Zhao Feifei and Ding [5] believe that financial sharing service is the use of advanced information technology to re-engineer the simple and repeated financial business processes of an enterprise, thereby reducing enterprise costs and improving management efficiency. Maatman et al. [6] believe that financial shared service is a way of internal control of customer service delivery, which can eliminate complex local control and improve the efficiency of enterprise management and control. Huang et al. [7] The emergence of financial shared service centers broke the traditional management pattern, strengthened corporate management and control capabilities, and reduced decision-making errors and fraud.

Li et al. [8] believe through research that effective internal control can significantly improve a company's R&D. Zhong et al. [9] found that perfect internal control can significantly promote enterprise innovation investment. Zhang et al. [10] believe that internal control can effectively avoid and prevent innovation risks, and there is a significant positive correlation between R&D investment and innovation efficiency. Li Li and Qi [11] conducted an empirical study on A-share listed companies and found that internal control has a positive role in promoting the innovation performance of enterprises, and it has a more significant role in promoting non-state-owned enterprises. Yang et al. [12] found through empirical research that there is a significant positive correlation between internal control quality and corporate innovation.

In summary, the financial sharing service through the reengineering of the financial accounting process allows the business of the enterprise to be highly concentrated. On the one hand, it can streamline the organizational structure of the enterprise, greatly reduce the risk of unclear assignment of responsibilities for employees, and create more time for innovation activities for employees. On the other hand, the new management model of the financial sharing center is subverting the management consciousness of traditional managers. Innovation is the ultimate advance to enhance the core competitiveness of the enterprise. Finally, the establishment of the financial sharing service center can effectively improve the internal control environment of the enterprise and the operating efficiency of the enterprise. Innovation activities are an important part of business management, and the implementation of financial shared services can promote the improvement of innovation capabilities to a certain extent.

## 3. The Mechanism of Financial Shared Services on Innovation Performance

This article innovatively constructs the mechanism of financial shared services for corporate innovation activities, as shown in Figure 1.

First, at the employee level, the financial sharing model can release a large amount of employees' complicated and repetitive labor time by centrally processing repetitive business, so that they can have more energy to participate in

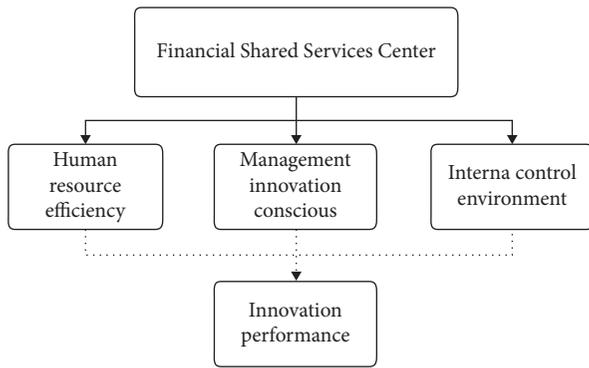


FIGURE 1: The mechanism of financial sharing and corporate innovation performance.

activities that can create higher value, such as corporate innovation activities; second, at the level of enterprise managers, the construction of this new management model will convey the importance of innovation to the management and enhance the awareness of innovation of managers; third, at the level of the corporate internal control environment, a good internal control environment is to enhance the company's foundation of innovative capabilities, financial sharing services can require enterprises to adopt a business-financial integration model, and business processes will be more standardized and require the participation of all employees. Under this model, the links between various departments will be closer, and the efficiency of information transmission will be effective. The level of internal control will be effectively improved and provided a good environmental foundation for enterprises to improve their innovation capabilities.

## 4. Research Design

**4.1. Research Hypothesis.** At present, China's economy is in a transitional period from rapid growth to high-quality growth, and entering the "new normal" development stage. As one of the important ways to transform and upgrade the economic structure, innovation is increasingly being valued by the state and enterprises. The financial sharing service can reengineer the business process of the enterprise to build a standardized process. This management model centralizes the original simple and repetitive tasks, which greatly reduces the workload of simple and repetitive tasks for employees. At the same time, financial shared service center is a new management model, the process of building the center will enhance managers and even the whole staff's awareness of the importance of innovation, not only that but mostly the internal control environment of the enterprise will be improved as the management efficiency improved. Zhang [13] conducted a questionnaire survey on large enterprises that implement financial sharing services and found that implementing financial sharing service can improve management control ability and work efficiency, and cost savings of enterprises, and liberate personnel. Li and Qi [11] believe that effective internal control can standardize and institutionalize the enterprise's technological innovation investment by clarifying the division of labor and employee

responsibilities and standardizing the authorization and approval system, so as to improve the enterprise's innovation output rate. Xu Yu et al. [14] found through empirical research that a high level of internal control can restrain the self-interested behavior of corporate managers and reduce managerial laziness and other opportunistic behaviors, which is conducive to corporate innovation.

In summary, this article believes that the implementation of financial shared services can improve the company's internal control environment by improving the efficiency of corporate management, enhancing management's awareness of innovation, and improving the enterprise's innovation level, thus proposing Hypothesis H1.

H1: there is a significant positive correlation between financial shared services and the level of corporate innovation.

**4.2. Sample Selection and Data Sources.** This study selects the data of A-share listed companies from 2008 to 2018 as the initial research sample, uses the DID empirical research method, and uses the nature of corporate property rights as the moderator to make an empirical analysis of whether to establish financial shared services and the innovation input of listed companies. According to whether the listed company has established a financial sharing service, the sample is divided into an experimental group and a control group. The sample period is 2003–2019, and the data are processed according to the following principles:

- (1) Delete financial company
- (2) Delete B-share company
- (3) Delete missing data

Finally, we obtained a total of 9,235 observations as research samples. Because our sample size is very large, in order to prevent outliers from affecting the empirical results, we Winsorize all continuity variables at 1% and 99% levels and cluster all regression standard errors at the company level cluster processing. The data were extracted from the ACCA official website and the CSMAR database.

### 4.3. Variable Selection

**4.3.1. Explained Variable.** The explained variable is the innovation performance, and we use the total number of patent output to measure the innovation performance. The reason is as follows: Domestic scholars have no unified standard for the measurement of innovation performance. The research of comprehensive scholars mainly includes four types of measurement of innovation performance. The first is the R&D investment of enterprises (Wang and Liu [15]); the second is the number of enterprise patent applications (Dosi et al. [16], Zhou et al. [17]). Innovation is a process with a long cycle. The most intuitive manifestation of the intensity and results of innovation activities lie in the number of patent output of a company, so here we use the total number of patent output to measure the level of innovation performance of the company.

**4.3.2. Explanatory Variables.** This study adopts the DID regression analysis method and uses stata15.0 to regress the sample data. Among them, whether to implement financial sharing services is the most explanatory variable, that is, the logical variable or treat. The enterprise implements financial sharing services without the experimental group assigning value 1, not implementing finance. The shared service does not control the assignment of 0 for the group. When the experimental group enters the treatment period and is affected by the financial sharing service, a value of 1 is assigned, and otherwise, a value of 0 is assigned.

#### 4.3.3. Control Variable

- (1) Company age (age): in this study, the age of listed companies is measured by the time interval from the establishment of the company to the balance sheet date. The longer the existence of a listed company, the better the foundation for implementing financial sharing services, the easier it is to raise funds.
- (2) Whether the chairman is dual: the chairman and general manager take the value 1, and otherwise, the value is 0.
- (3) Board size (board): this article uses the number of board members plus one to take the natural logarithm to measure the board size.
- (4) The proportion of independent directors (indr): this article uses the number of independent directors divided by the total number of board members to measure the proportion of independent directors.
- (5) The proportion of shares owned by the largest shareholder (top1): this article uses the proportion of common shares held by the largest shareholder to the total share capital to measure.
- (6) Price-to-book ratio (pb): this article uses market value divided by net assets to measure the price-to-book ratio.
- (7) Company size (size): this article uses the natural logarithm of total assets to measure company size.
- (8) Asset-liability ratio (lev): this article uses total liabilities divided by total assets to measure the asset-liability ratio.
- (9) Tobin Q book-to-market value ratio (tob): this article uses Tobin's Q value divided by book market value to measure Tobin Q's book-to-market value ratio.
- (10) Audit quality (big4): this article uses whether the auditors of listed companies are from the big four accounting firms to measure, the value from the big four accounting firms is 1, and otherwise, the value is 0.

**4.3.4. Moderator.** In order to further study the influence of different property rights on the relevance of financial shared services and the level of enterprise innovation, this study

selects the property rights dummy variable as the adjustment variable, in which state-owned enterprises are assigned a value of 1, and non-state-owned enterprises are assigned a value of 0.

In conclusion, all variables are shown in Table 1.

**4.4. Model Design.** In order to test the correlation between the construction of financial shared services and the company's innovation performance, this study uses the DID method to construct a regression model. We have compared many regression models, and we find that whether regression is the most suitable for the study of effect of policy implementation, so we finally choose the method.

Based on the above research hypotheses, the following models are constructed, respectively:

$$R\&D_t = \alpha + \beta_1 \times \text{Train} + \beta_2 \times \text{TrainPost}_t + \beta_3 \times \text{Control}_t + \Sigma \text{Year} + \Sigma \text{Industry} + \epsilon t. \quad (1)$$

In the model,  $R\&D_t$  represents the company's innovation performance, which is measured by the company's total patent output; if Train is equal to 1, it represents the experimental group, and if it equals 0, it represents the control group. Train equal to 1 means companies which established a financial sharing center; we call it experimental group; if the companies did not establish a financial sharing center, the train equals to 0; we call it control group. Trainpost is equal to 1 if the experiment group already established the financial sharing center; otherwise, trainpost is equal to 0. The coefficient we are interested in is  $\beta_2$ , which measures the change in corporate performance of listed companies in the experimental group before and after the establishment of the financial sharing center compared to the difference in corporate innovation performance of listed companies in the control group. We expect  $\beta_2$  to be positive, which means that the establishment of a financial sharing center increases corporate performance. At the same time, this study introduces variables of the nature of property rights to study the correlation between the financial shared services of state-owned enterprises and non-state-owned enterprises and the innovation performance of enterprises.

## 5. Empirical Result Analysis

**5.1. Descriptive Analysis.** This article uses stata15.0 to perform descriptive statistics on the main variables in the empirical test. The statistical results are shown in Table 2.

The sample statistics show that this empirical study has a total of 9,235 observations, of which the average total patent output is 51.746, indicating that the average annual patent output of the sample companies is 51.746, the highest value is 13,394, and the minimum value is 1. The average treat value of 0.015 indicates that about 1.5% of the observations are companies that implement financial shared services, and the average treatpost value of 0.006 indicates that 0.6% of the observations have entered the benefit period of financial shared services. soe is a dummy variable of property rights.

TABLE 1: Variable definitions.

Types of variable	Variable name	Variable symbol	Variable definition
Explanatory variable	Financial shared	Treat	Experimental group is the corporate with expand financial shared service model value 1; if not value 0
		treatpost	Treatment date dummy variable, if the corporate in the treatment date value is 1; if not value 0
By explanatory variable	Total patent output	Output	The number of patent output
	Company age	Age	Year-date of establishment
	Chairman and managing director	Dual	If the chairman and managing director are the same value 1; if not value 0
	Board size	Board	Ln (the number of board of directors+1)
	Proportion of independent directors	Indr	The number of board of directors/the number of independent
Controlled variable	Proportion of the largest shareholders	top1	The total number of shares/the number of shares held by the largest shareholder
	Price to book value ratio	Pb	Price/book value ratio
	Company size	Size	Ln (total assets)
	Asset-liability ratio	Lev	Liability/asset
	Tobin Q book to market ratio	Tob	Tobin Q/book to market
Moderating variable	Audit quality	big4	If auditor is one of the big four accounting firms value 1; if not value 0
	Industry	Idu	Industry fixed effect, control industry influence
	Year	Year	year fixed effect, control year influence

TABLE 2: Variable descriptive statistics table.

Variable	Obs	Mean	Std. Dev.	Min	Max
Stkcd	9,235	220,193.300	235,803.200	100.000	603,998.000
Output	9,119	51.746	265.743	1.000	13,394.000
Treat	9,235	0.015	0.121	0.000	1.000
Post	9,235	0.006	0.076	0.000	1.000
treatpost	9,235	0.006	0.076	0.000	1.000
age	9,235	14.353	5.333	2.000	52.000
dual	9,235	0.353	0.478	0.000	1.000
board	9,235	2.238	0.167	1.609	2.944
indr	9,235	0.375	0.055	0.143	0.800
top1	9,235	35.224	14.653	3.003	88.549
pb	9,235	4.179	3.013	0.152	41.587
size	9,235	21.729	1.182	19.199	28.509
lev	9,235	0.344	0.186	0.008	0.973
tob	9,235	2.167	1.288	0.735	19.824
soe	9,235	0.200	0.400	0.000	1.000

State-owned enterprises are 1, and private enterprises are 0. From the above table, we can see that its mean value is 0.2, which indicates that about 20% of the sample companies are state-owned enterprises.

5.2. Regression Analysis. This study takes R&D investment as an explanatory variable of enterprise innovation performance and uses stata15.0 to perform regression analysis on the relationship between the implementation of financial shared service dummy variables and enterprise innovation performance. The analysis results are shown in Table 3.

From the regression results in the above table, the most cared variable is treatpost, and the results show that the company's innovation performance measured by the total patent output and the financial sharing service shows a

significant positive correlation within the 1% confidence interval; that is, the company's total patent output has increased after the implementation of the financial sharing service. The regression results show that the implementation of financial shared services can improve corporate management efficiency to a certain extent, improve the internal control environment, and thereby enhance corporate innovation performance. The treat shows a significant positive correlation within in 10% confidence interval, and *ti* means companies build FSS will be helpful to increase corporate's innovation performance. As the result shown in Table 3, the relationship between control variables age, top1, tob, and company's innovation performance has no significance; it means that we can ignore the these control variables's influence to the company's innovation performance. Hypothesis H1 is established.

### 6. Robustness Test

This article adopts the method of replacing the explained variable, that is, the return on total assets, to conduct a robustness test. There are many methods that can test robustness, and changing the variable is one of the most common methods so we choose it to control the validity and reliability of research methods.

Here, we use other inventions and invention patents to replace the original patent output for regression analysis. The regression results are shown in the following Table 4.

The robustness regression results show that whether the original explained variable is replaced by the total patent output, other inventions, or invention patents, and there is a significant positive correlation between the implementation of financial sharing services and the explained variables;

TABLE 3: Financial shared services and the regression results of enterprise innovation performance.

	Output
treatpost	921.8*** (5.92)
treat	108.3* (2.51)
age	-0.346 (-1.05)
dual	23.93*** (5.47)
top1	0.0882 (0.75)
board	38.47* (2.60)
indr	149.4*** (4.83)
pb	4.655** (3.69)
size	64.65*** (9.73)
lev	-57.84*** (-4.62)
tob	0.0347 (0.02)
big4	159.5*** (6.09)
_cons	-1553.2*** (-8.74)
<i>N</i>	9119
<i>r</i> <sup>2</sup>	0.237

Note. \*\*\*, \*\*, \*, respectively, indicate that the regression coefficient is significant at the level of 1%, 5%, and 10%.

TABLE 4: Robustness test regression results.

	Other	Patent
treatpost	719.6*** (4.89)	221.3** (3.31)
treat	94.90* (2.94)	21.13 (1.61)
age	-0.346 (-1.73)	0.0925 (1.18)
dual	19.96*** (5.11)	3.902** (3.40)
top1	0.0816 (0.91)	-0.0216 (-0.51)
board	27.66* (2.36)	14.21 (2.14)
indr	124.4** (4.18)	34.09** (4.14)
pb	3.603** (3.86)	1.104* (3.09)
size	47.67*** (10.65)	15.92*** (6.58)
lev	-36.87** (-4.50)	-18.80** (-4.30)
tob	-0.374 (-0.30)	-0.0693 (-0.25)
big4	118.4*** (5.87)	29.37*** (9.24)
_cons	-1149.7*** (-9.56)	-390.6*** (-5.45)
<i>N</i>	9014	9103
<i>r</i> <sup>2</sup>	0.212	0.202

Note. \*\*\*, \*\*, \*, respectively, indicate that the regression coefficient is significant at the level of 1%, 5%, and 10%.

namely, the implementation of financial shared services by enterprises has a significant positive role in improving the level of innovation of enterprises.

## 7. Conclusion

This study takes the relevant data of my country's A-share listed companies from 2008 to 2018 as the research sample. By constructing a DID regression model and using stata15.0 for data analysis, this study empirically tests the correlation between financial shared services and company innovation performance. The research results prove the hypothesis mentioned in the previous article that there is a significant positive correlation between the implementation of financial shared services and the company's innovation performance; that is, the implementation of financial shared services can effectively improve the company's innovation results.

The financial sharing service makes the complicated financial accounting work of the enterprise more standard and efficient. The organizational structure of the enterprise has changed from decentralized management to centralized management, which significantly reduces the labor cost of the enterprise, improves the management level of the enterprise, optimizes the internal process, and promotes the organization. Structural transformation has improved the quality of financial information and improved the internal control environment of the enterprise. Therefore, driven by shared services, a stronger sense of innovation, more investment in innovation, and a better internal control environment will inevitably promote the improvement of enterprise innovation performance. The empirical regression results of this article confirm that the implementation of financial shared services has a significant effect on the innovation performance of enterprises and explores a new path for enterprises to improve their innovation level.

However, in our study, the experimental group is the corporate with expand financial shared, but the level of the FSS is different, and we think the time to build FSS will influence the relationship of FSS and corporate innovation performance. So we plan to do more studies on the relationship between different situations of FSS and corporate innovation performance.

## Data Availability

No data were used to support this study.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

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