TECHNOLOGICAL INNOVATION CAPABILITY IMPACTS TO FINANCIAL PERFORMANCE AND GROWTH PERFORMANCE OF SMES IN GUANGXI

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ABSTRACT
This study aims to investigate the impact of technological innovation capability on the financial performance and growth performance of SMEs in Guangxi. The sample was drawn from 361 middle and senior managers in private industrial enterprises in Guangxi. A questionnaire survey was conducted to collect data from medium-sized enterprises, small-sized enterprises and micro-enterprises in Guangxi using the non-probability sampling methods. Descriptive statistical methods and multiple regression methods were used to analyze the data. It was found that, except for learning capability and R&D capability ($P > 0.05$), Resource allocation capability, manufacturing capability, marketing capability, organizing capability and strategic planning capability has a positive and significant effect on the financial performance of SMEs in Guangxi, learning capability, R&D capability, Resource allocation capability, manufacturing capability, marketing capability, organizing capability and strategic planning capability has a positive and significant effect on the Growth performance of SMEs in Guangxi .
Keywords: Technological Innovation Capability, Financial Performance, Growth Performance, SMEs in Guangxi

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INTRODUCTION

Innovation is the first motivation to lead development, the strategic support for promoting high -quality development and building a modern economic system. The country attaches great importance to scientific and technological innovation in enterprises. China's 12th Five Year Plan clearly proposes to accelerate the construction of a national innovation system and continuously strengthen the position of enterprises as the main body of technological innovation (Wang, Wei, & Mou, 2021). In 2015, the State Council issued the "Opinions of the State Council on vigorously promoting several policies and measures for public entrepreneurship innovation" encouraged the whole people to participate in innovation work. Source come from the official website of the Central People's Government of the People's Republic of China (https://www.gov.cn/govweb/zhengce/content/2015-06/16/content_9855.htm). In 2020, the Proposal of the Central Committee of the CPC on Formulating the 14th Five Year Plan for National Economic and Social Development and the Vision of 2035, adopted at the Fifth Plenary Session of the 19th Central Committee of the Communist Party of China, proposed to improve the technological innovation capability of enterprises, put forward clear requirements for the construction of technological innovation capability of enterprises, and pointed out the focus and direction of the construction of technological innovation capability of enterprises. Source come from the official website of the Central People's Government of the People's Republic of China (https://www.gov.cn/zhengce/2020-11/03/content_5556991.htm). After the completion of China-ASEAN Free Trade Zone, SMEs in Guangxi have developed rapidly. SMEs have become an important force to promote Guangxi's economic growth and increase fiscal revenue, expand employment, and increase the economic income of urban and rural residents' economic income. According to the 2021 Guangxi Zhuang Autonomous Region National Economic and Social Development Statistics Bulletin, the number of small and medium-sized enterprises (SMEs) in China has exceeded 40 million, accounting for 99.5 percent of the total number of enterprises in the country. SMEs are mainly concentrated in labor-intensive industries such as manufacturing, wholesale and retail trade, catering and accommodation. Among them, small and micro enterprises account for 78% of the total number of SMEs. On August 28, 2022, the construction of the Pinglu Canal began. The development of shipping is the main focus, combined with water supply, irrigation, flood control, and improvement of the water ecological environment. Data source: (https://baijiahao.baidu.com/s?id=1742389853433842690&wfr=spider&for=pc). This is a once-in-a-lifetime external development opportunity for small and medium-sized enterprises in Guangxi, and more large-scale industrial enterprises have already settled in Guangxi and Nanning one after another, which at the same time This also means that SMEs will face more opportunities and challenges. Therefore, attaching importance to the technological innovation of SMEs in Guangxi, studying the technological innovation capabilities of SMEs in Guangxi, has certain theoretical significance for the development of SMEs in Guangxi, as well as provide theoretical contribution to previous literature. In a practical sense, the impact of the technological innovation capabilities of SMEs in Guangxi on financial performance and growth performance has a certain reference value for corporate managers, which has certain reference significance for other companies in the industry.

LITERATURE REVIEWS

Technological innovation capability and financial performance

Wang Xigang (2016) analyzed 174 industrial manufacturing enterprises in Shenyang, Dalian and Changchun as the research object. He decomposed technological innovation capability into product innovation capability and process innovation capability from the perspective of resource base view. The results of the study show that: technological innovation capability has a positive impact on enterprise performance; product innovation capability, as an

organizational innovation practice, has a direct impact on enterprise performance, but the impact of process innovation capability on enterprise performance is moderated by the moderating effect of product innovation capability. Zhu Nailing (2019) took high-tech enterprises in China as the research object, and the results showed that investment in technological innovation can significantly improve the short-term financial performance and long-term financial performance of enterprises. Huang, Yawen, and Yiyao Li (2019) by analyzing the financial data of 40 companies in the communication equipment industry from 2010-2017, the results show that technological innovation capability is positively related to overall firm financial performance. Li, Xiaoyu and Guoqing Chen (2019) by analyzing the data of listed companies in China's manufacturing industry from 2012 to 2017, the results show that investment in technological innovation will have a promotional effect on corporate performance. Ren, H. Y. and Shi, P. (2009) an empirical study on the relationship between R&D investment and firm performance of listed pharmaceutical companies from 2001 to 2004 shows that R&D investment is significantly related to firm performance and the correlation between the two decreases over time. Jie, Maohua, Jin Wang and Dongmei Liu (2014) Measuring firm performance by Tobin's Q. The results show that firms' R&D investment is significantly and positively correlated with firms' business performance, and there is a certain lag effect. Xu, Chaoyang, Zhao, Xiaoyang and Wang, Chenchen (2018) Taking strategic emerging industries as the research object and studying from the perspective of financing constraints, the results of the study show that R&D investment significantly promotes the improvement of corporate performance and there is a lagged effect in this promotion relationship.

Some domestic and foreign scholars have other views on the relationship between technological innovation and financial performance. Xu J., Liu F., and Chen Y. H. (2019) in his study found that R&D expenditures do not have a significant effect on the financial performance of large-scale firms, while they have a significant negative effect on the financial performance of small-scale firms. Ou Chun (2010) found that R&D personnel investment positively contributes to financial performance, while R&D capital investment is not significantly correlated with financial performance with no lag in the study of SMEs. Su, X. H. and Zhao, X. H. (2013) concluded that R&D investment is not significantly correlated with profitability, but negatively affects debt service, operation and development ability in a sample of listed companies in China's high-end manufacturing industry.

Technological innovation capability and growth performance

Jie, Wang, and Liu (2014) studied from the perspective of environmental regulation. Studies have found that technological innovation in the scope of environmental permission is conducive to the growth of corporate comprehensive performance. Wang, Fan, and Liu (2021) through the relevant performance functions established by the production function, research shows that enterprises will generate the best technological innovation model during the process of technological innovation, so as to determine the technological innovation route and bring the growth of enterprise growth. Come a lot of value -added. Zhang, Yuan, and Shang (2022) By studying the establishment of the relationship between the Technological capabilities and development models of Chinese manufacturing enterprises, it was obtained to obtain the company's technological innovation capabilities to affect the growth performance of the enterprise with the help of direct or indirect forms. On the one hand, through technological innovation R&D or iteration or improvement, it can directly promote the integration method of Technological use and Technological resources of the enterprise to enable enterprises to achieve the achievement of growth goals; on the other hand, the improvement of corporate technological innovation capabilities has It is conducive to corporate reconstruction of Technological knowledge resources, so that enterprises use innovative technology to carry out product innovation or efficient allocation of technological innovation resources, thereby

achieving the goal of enterprise growth. Ding, Zhang, and Yang (2022) Believes that technological innovation capabilities have a positive relationship with corporate growth performance. Shen Fei (2021) and others were inspected by empirical inspections that patent execution insurance and corporate technological innovation have significantly promoted corporate performance.

Technological innovation capability and innovation performance

Lau, YAM, and Tang (2010) study the correlation between TIC and the innovation performance of the electronics industry in the Hong Kong (HK)/Pearl River Delta region, and the results show that R&D, resource allocation, learning, and strategic planning capabilities can significantly enhance innovation sales. R&D and resource allocation capabilities can also significantly improve new product introduction.

Technological innovation capability and corporate performance

Zhang and Yang (2021) By constructing a variable model of "digital technology capabilities for business model innovation and an enterprise performance", the effect of digital technology capabilities on corporate performance and the intermediary role of business model innovation, using the Shanghai and Shenzhen stock markets to be listed in the market. The company's annual report data verifies the research assumptions, and the digital technology capabilities of the enterprise can promote the innovation and performance improvement of the business model of the enterprise. The enterprise's business model innovation can promote the improvement of the performance of the enterprise. Jiaqi Dong (2022), through a study on the impact of innovation capability on firm performance of green food firms in Heilongjiang Province in a crisis situation, concluded that technological innovation capability has a positive impact on the performance of food firms. Technological innovation capability has a positive effect on growth performance. But there is no significant positive effect on financial performance.

This article is based on the TIC model built by Lau, A. K., YAM, R. C., and Tang, E. P. (2010) and the innovative capabilities built by Dong Jiaqi (2022) corporate performance models are the theoretical framework, which builds a learning capability, R&D capability, Resource allocation capability, manufacturing capability, marketing capability, organizing capability, strategic planning capability are independent variables, and financial performance and growth performance as the conceptual framework for variables.

From the literature review, the conceptual framework can be drawn as shown in Figure 1.

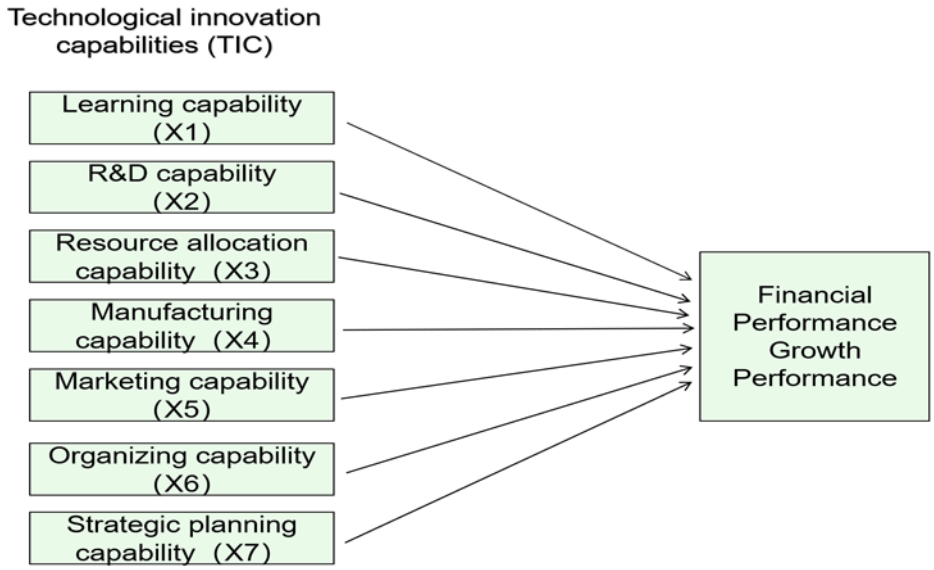

Figure 1 Conceptual Framework

Research Hypothesis shows below:
H1: Technological Innovation Capabilities (X1, X2, X3, X4, X5, X6, X7) have a positive impact on the financial performance of SMEs in Guangxi.
H2: Technological innovation capabilities (X1, X2, X3, X4, X5, X6, X7) have a positive impact on the growth performance of SMEs in Guangxi.

RESEARCH METHODOLOGY

In order to test the marketing of technological innovation capability on the financial performance and growth performance of SMEs in Guangxi, this study utilized a quantitative research method. The population of this study consisted of middle and senior managers of 5935 private industrial enterprises from Guangxi, and 361 middle and senior managers of private industrial enterprises in Guangxi were selected based on the sample size calculation of the Krejcie and Morgan (1970) study. The study used a non-probability sampling method. The questionnaire was divided into four parts. In the first part of the questionnaire, it included demographics such as gender, age, education and position. Then, the second to fourth parts used Likert scale from 1 to 5 on a scale of 1-5 to study relationship-oriented technological innovation capability (TIC), financial performance (FP) and growth performance (GP) with seven, three and three observational variables, respectively. Before applying the instrument for data collection, the questionnaire was systematically tested for reliability through Cronbach's alpha. The findings showed a Cronbach's alpha of 0.898, indicating that the research instrument was of sufficient quality (Polit & Beck, 2006; Hair et al., 2012). In order to obtain data, this study sent questionnaires to different middle and senior managers in private industrial companies in Guangxi. Regarding data analysis, descriptive statistics were used, including frequencies, percentages, means and standard deviations. Multiple regression analysis was then used to verify the impact of the seven dimensions of technological innovation capability on financial performance and growth performance, and the results were reported in descriptive and tabular forms in order to address the achievement of the focused objectives. All details are presented in the next section.

RESEARCH RESULTS

Respondents' Profiles and Studied Variables

Descriptive statistics about the basic information of the sample are as follows: Gender: majority respondent 46.8% are female and 53.2% are male. Age: majority respondent 7.2% are Age 21-30, 66.8% are Age 31-40, 22.3% are 41 to 50 years old, 3.0% are Over 51 years old. Education: majority respondent 8.9% is Associate Degree, 61.8% is Undergraduate, 23% is Master, 6.4% is PHD and above. Position: majority respondent 15.2% is Marketing Manager, 19.1% is Financial Manager, 16.1% is Human Resources Manager, 7.8% is Production manager,5.8% is Marketing Director, 8.0% is Chief Financial Officer, 6.9% is Director of Human Resources, 12.2% is Other Department managers, 8.9.% is General Manager and above.
The descriptive statistics about the variables are shown in Table 1, demonstrating the Mean, Standard Deviation and Interpretation of Related Variables

Table 1 Mean, Standard Deviation and Interpretation of Related Variables

Variables （n=361）	$\bar{X}$	S.D.	Meaning
Learning Capability Mean	3.96	1.034	agree
R&D Capability Mean	3.99	0.96	agree
Resource allocation capability Mean	2.63	1.265	Neutral
Manufacturing Capability Mean	3.9	0.959	agree
Marking Capability Mean	4.15	0.915	agree
Organizing Capability Mean	4.03	0.905	agree
Strategic planning Capability Mean	3.89	1.12	agree
Financial Performance Mean	4	0.894	agree
Growth Performance Mean	3.9	0.971	agree

As can be seen from Table 1, the above nine variables of the Mean, Standard Deviation and Interpretation of Related Variables. Just Meaning of Resource allocation capability is Neutral, others variables are meaning agree.

Hypothesis Analysis

Table 2 Model Summary of Financial Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	F	Sig.
1	.926[a]	.858	.855	.31239	1.393	304.798	.000

The model fit is shown in Table 2, Adjusted R Square is 0.855, indicating that the independent variable can explain 85.5% of the variation in the dependent variable; Durbin-Watson value is 1.393 less than 3, F value is 304.798, significance level is less than 0.05, the model fit is good.

Table 3 Coefficients

Model	B	Std. Error	Beta	t	Sig.	VIF
(Constant)	-.835	.168		-4.965	.000	
Learning capability	.038	.029	.038	1.300	.194	2.169
R&D capability	.005	.038	.005	.129	.898	3.108
Resource allocation capability	.131	.019	.195	6.876	.000	2.008
Manufacturing capability	.122	.033	.120	3.722	.000	2.580
Marking capability	.209	.038	.209	5.505	.000	3.573
Organizing capability	.279	.030	.349	9.430	.000	3.403
Strategic planning capability	.469	.040	.463	11.697	.000	3.898

The specifics of the fitted coefficients of the model are shown in Table 3, where the effects of all variables on the dependent variable are significant except Learning capability and R&D capability. The coefficients of the independent variables on the dependent variable are all greater than 0, indicating that the independent variables have a positive effect on the dependent variable. All hypotheses are valid except the hypothesis that Learning capability and R&D capability have a positive effect on Financial Performance.

Table 4 Model Summary of Growth Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	F	Sig.
1	.918	.842	.839	.35054	1.067	269.242	.000

The model fit is shown in Table 4, Adjusted R Square is 0.839, indicating that the independent variable can explain 83.9% of the variation in the dependent variable; the Durbin-Watson value is 1.067 less than 3 and the F value is 269.242, the significance level is less than 0.05, the model fit is good.

Table 5 Coefficients

Model	B	Std. Error	Beta	t	Sig.	VIF
(Constant)	-1.106	.189		-5.865	.000	
Learning capability	.066	.033	.062	2.007	.046	2.169
R&D capability	.164	.042	.144	3.853	.000	3.108
Resource allocation capability	.104	.021	.146	4.867	.000	2.008
Manufacturing capability	.076	.037	.070	2.052	.041	2.580
Marking capability	.150	.043	.141	3.524	.000	3.573
Organizing capability	.229	.033	.269	6.898	.000	3.403
Strategic planning capability	.497	.045	.461	11.052	.000	3.898

The specifics of the fitted coefficients of the models are shown in Table 5. The effects of the independent variables on the dependent variables are all significant, $p < 0.05$, and the coefficients of the independent variable on the dependent variables are all greater than 0, indicating that the independent variables have a positive effect on the dependent variables, and the hypotheses are all valid.

DISCUSSION & CONCLUSION

It was found that, except for learning capability and R&D capability ($P > 0.05$), Resource allocation capability, manufacturing capability, marketing capability, organizing capability and strategic planning capability has a positive and significant effect on the financial performance of SMEs in Guangxi, and the hypothesis holds. Technological innovation capability has a positive and significant effect on the growth performance of SMEs in Guangxi, and the hypothesis holds. This research also confirmed that Technological Innovation Capability Model (TIC) can be used in on the financial performance and the growth performance of SMEs, the hypotheses are valid.

About the discussion, For H1, the results of the study show that most of the respondents believe that Resource allocation capability, manufacturing capability, marketing capability, organizational capability and strategic planning capability have a positive effect on the financial performance of SMEs in Guangxi. The results of this survey study are similar to those of Wang Xigang (2016), Liang Haisan, Wei Jiang and Wan Xinming (2018), Zhang Sheng and Yang Qian (2021), Huang, Yawen, and Yiyao Li (2019) and Nai-Ping Zhu (2019) mentioned in Chapter 2 Theory. They all think that technological innovation capability had a significant positive impact on firm performance.

Learning capability and R&D capability have a negative effect on the financial performance . The results of this survey study are similar to those of Xu J., Liu F., and Chen Y H. (2019), Jiaqi Dong (2022) and Yam et al., (2004). Dong (2022) mentions technological innovation capability as a variable of innovation capability, through the study of the impact of innovation capability on firm performance of green food enterprises in Heilongjiang Province under crisis situation, concluded that innovation capability has a positive impact on the performance of food enterprises as a whole, but there is no significant positive impact of technological innovation capability on financial performance. The insignificant effect of learning capability and R&D capability on financial performance is mainly explained by the time lag effect. The time lag effect is a representation of the causality of things, which widely exists in nature and human society. The promotion effect of R&D investment on a firm's development can be

divided into direct effect and indirect effect, but both effects are dynamic and have time lag effect. (Donglin Xu & Yunnan Guo, 2007) argue that the time lag effect of R&D investment on firm value is essentially a monetary time lag effect. Through extensive empirical studies, Milton Friedman (1912-2006) found that it takes about 6 to 9 months for a change in the money growth rate to cause a change in the nominal income rate and another 6 to 9 months to cause a change in prices, i.e., there is a total lag of about 12 to 18 months from money growth to price increase. (Yin, He, Fan, Xingyue, & Feng, Jiacong, 2017), through an empirical analysis of the impact of R&D investment on firm value of high-tech companies in China, found that there is a time lag effect on the impact of their R&D investment on firm value, with a lag of one to five years.

For H2, the results of the study indicate that most of the respondents believe that TIC has a positive effect on the growth performance of SMEs in Guangxi. The results of this study are similar to those of Jin Wang and Dongmei Liu (2014), Jianwen Wang, Lili Fan and Lu Liu (2021), Chungxin Zhang et al. (2022) and Samuel Gyedu et al. (2021). Jin Wang and Dongmei Liu (2014) conducted a study from the perspective of environmental regulation and found that technological innovation within the scope of environmental permissibility is beneficial to the growth of the firm's overall performance. Wang Jianwen, Fan Lili, and Liu Lu (2021), through a related performance function established by production functions, showed that firms generate optimal technological innovation patterns in the process of technological innovation, thus determining the technological innovation route, which brings great value-added to firm growth. By constructing the relationship between technological capabilities and development patterns of Chinese manufacturing firms, Zhang Chungxin et al. (2022) concluded that the technological innovation capabilities of firms influence the growth performance of firms with the help of two forms, either directly or indirectly. Ding, Bin, Zhang, Jingjing, and Yang, Baojun (2022). It is believed that technological innovation capability has a positive relationship with firm growth performance.

In conclusion, in the context of economic globalization, the strength of science and technology innovation directly and profoundly affects the economic strength, as well as the competition between countries and enterprises, and the ability to master more advanced science and technology is sufficient to support an enterprise to endure, showing the importance of technological innovation capability to the growth of SMEs.

However, this study has some limitations that must be considered that can potentially lead to an improved future. Begin with the limitations related to the research approach were taken into account since this study had emphasis on adopting a quantitative approach. Consequently, future research may utilize other research approaches, for example, adding interviews. Regarding the SMEs of private industrial enterprises in Guangxi as the research object, the sample size is limited, and the number of data collected is limited considering the existing capacity of the authors, whether it can be applied to all SMEs, and such generalizability is to be studied. The results of data analysis are subject to a number of major limitations, and the interpretations must therefore be regarded as tentative rather than definitive in the long term, since the data are obtained from senior managers in the firms, and the firms themselves are often not the best judges of their own performance. For future research, the questionnaire content can be increased: the type of enterprise, the number of years the enterprise was established, and the number of years the manager has been working, and other basic information, in order to facilitate the understanding of more information about the enterprise, Industry Type and increase the reliability. The impact of technological innovation capability of enterprises in different provinces, cities and industries on enterprise performance can be studied, and consideration can be given to adding the dimension of technological innovation capability of enterprises. It can also be considered to study the coordination of technology strategy formulation and technology innovation capability activities of Chinese enterprises.

The study starts from the perspective of technological innovation capability, and does not take into account factors such as domestic and international market environment, cultural differences, and management differences, etc. Future studies can be considered in these aspects to enrich the relevant research. Meanwhile, there are many factors affecting the financial performance and growth performance of SMEs, and technological innovation capability is only a part of them, and other variables can be considered to be added for future research.

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