
INTERNATIONAL JOURNAL OF SCIENCE ARTS AND COMMERCE

IMPACT OF BUSINESS MODEL INNOVATION ON PERFORMANCE OF CHINESE LISTED PHARMACEUTICAL COMPANIES

QIU ZHENG

(Asia Metropolitan University)

Abstract

The pharmaceutical industry is an important part of the national economy. It is a comprehensive industry that combines traditional and modern industries and integrates primary, secondary and tertiary industries. It is also an industry with high input, high output, high risk, knowledge intensive, strong professionalism and high degree of internationalization. It is closely related to life science. It does not have a mature period and is less affected by the economic crisis. It is an industry that will grow and develop forever, known as the "eternal sunrise industry". For an enterprise, there are many ways to improve its operation and performance, such as changing its external environment, internal capacity, resource conditions, production links, etc. But for an enterprise, the change of the external environment is difficult to achieve, which needs to pay a lot of cost; and under certain conditions, the level of resources and capabilities is not easy to improve. As a "value creation method", business model does not require the change of internal and external conditions of enterprises and is relatively easy to improve and innovate. Under the specific external environment and resource conditions, business performance can be improved through model activities. This paper defines the definition of business model, and uses questionnaire and in-depth interview to investigate the antecedents of business model. After sorting out and analyzing, six dimensions of the antecedent variables of business model are identified, namely customer demand, technological change, competition intensity, enterprise resources, organizational structure and entrepreneurship. Based on the analysis of related concepts and components, a measurement scale of business model antecedent was developed. Through empirical analysis, the reliability and validity of the scale were verified. Secondly, through literature research, this paper analyzes the concept of business model and business performance, and divides business model into three dimensions: customer value, internal value and cooperation value. Business performance is divided into two dimensions: financial performance and market performance. On this basis, it puts forward the hypothesis relationship between

business model and its antecedents and business performance, constructs the theoretical model of the relationship between business model and business performance, and verifies the model and hypothesis through empirical analysis. The results show that different dimensions of business model antecedent variables have different effects on business model and business performance. Among them, enterprise resources, technological change and entrepreneurship have significant effects on business model, customer demand, competition intensity and organizational structure have significant effects on some dimensions of business model, and three dimensions of business model have significant effects on business performance. As a supplement, the research also adds the relationship between the three dimensions of business model, that is, internal value and cooperative value have a significant impact on customer value. Through discussion, it is found that: due to the characteristics of Chinese pharmaceutical enterprises, the business model of sample enterprises has the characteristics of external similarity, internal diversification, key relativity, similarity difference and internal connection from the perspective of manifestation; while due to the characteristics of business model and business performance, there are three matching relationships between high-performance enterprises and business model, namely, high performance and enterprise business The matching of model comprehensiveness, the matching of high performance and business model applicability, and the matching of high performance and business model sustainability. In addition, through the analysis of the international pharmaceutical industry environment and the domestic pharmaceutical industry environment, this paper makes a strategic explanation of the matching relationship between the performance of Chinese pharmaceutical enterprises and the business model from three aspects: that is, the business model can affect the business performance by influencing the competitive advantage, the core competence of the enterprise, and cultivating the later development advantage of the enterprise. Finally, combined with the research results of the paper, from the perspective of enterprise and industrial policy, the paper puts forward its own suggestions for the development strategy of Chinese pharmaceutical enterprises.

Keywords: Business Model, Pharmaceutical Enterprise, Performance, Model Innovation

INTRODUCTION

In recent years, although the pharmaceutical logistics industry in China has developed rapidly, it still lags behind the developed countries as a whole due to the regional and industrial gap (Yang & Zou, 2013; Islankina, 2015; Ben, 2017; Li & Sun, 2017; Yang, Liu & He, 2019). At present, most of the domestic pharmaceutical logistics enterprises have evolved from the traditional pharmaceutical wholesale stations in China. However, under the current fiscal and tax system and administrative system in China, some local governments, based on local economic interests, have contributed

to the situation that many pharmaceutical logistics distribution organizations are many, small, scattered and disorderly, resulting in the situation of repeated construction of logistics distribution centers and idle resources. With the further establishment of the universal medical insurance system and the promotion of the construction of the basic drug system, the grass-roots operation mechanism and the reform of public hospitals, there will be a structural expansion of drug market demand. At the same time, in accordance with the requirements of the 13th five year plan of medical reform, the reform and development policies of drug distribution industry will be issued one after another, and the competent departments of the industry are also preparing to issue relevant policies and standards for industry management (Sun & Shen, 2007; Huang, 2013; Gong, 2015). The formulation and implementation of policies and standards will be conducive to further regulating and promoting industry development. Modern pharmaceutical logistics is to develop from the traditional wholesale mode to the supply chain management mode. With the logistics center as the platform, it establishes a market-oriented innovative supply business system with manufacturers, other upstream production enterprises, drug retailers and other downstream distributors, improves the efficiency of drug distribution, and forms a relatively stable production and marketing network with optimized service and minimized cost. What kind of development strategy should be adopted to achieve the economic goal of maximizing the interests of enterprises, break the traditional business development model, and innovate the business model with internet information tools is worth our in-depth exploration and research.

1.1 Background

On November 3, 2010, Wen Jiabao, the Premier of the State Council, delivered a speech on "let science and technology lead China's sustainable development". He first proposed seven strategic emerging industries in China, among which the biological industry ranked fifth, and the research and development of innovative drugs and medical equipment using biological technology was the focus of the development of the biological industry. On November 29, 2016, Premier Li Keqiang signed and approved the 13th five year national strategic emerging industry development plan, proposing to develop the biological industry into a 10 trillion scale emerging pillar industry by 2020. In his nineteen major reports, general secretary Xi Jinping pointed out the strategic objective of "accelerating the construction of an innovative country", and stressed that "strengthening the building of the national innovation system and strengthening the strategic scientific and technological strength." Premier Li Keqiang pointed out in the report on the work of the government of the State Council in 2018 that "we need to implement the innovation driven development strategy, optimize the innovation ecology, and form an innovation situation of Multi-Agent Coordination and all-round promotion." Under the background of "supply side reform", the development of strategic emerging industries has become an important way to improve the quality of supply.

If pharmaceutical manufacturing enterprises want to develop for a long time, they need to choose a suitable business model to maintain sustainable profits. Because the various industrial links of the pharmaceutical industry are closely linked, complicated and lengthy, some pharmaceutical enterprises have chosen the business model of the whole industrial chain, which can make the various industries cooperate with each other, to integrate the whole industrial chain and open up a new space for the survival and development of pharmaceutical enterprises. The implementation of the whole industry chain business model can not only expand the scale of enterprises, but also obtain rich profits; at the same time, it can effectively improve the supply of upstream goods, reduce costs and transaction costs, seize the market with the advantage of high quality and low price, and improve the comprehensive competitiveness of enterprises.

1.2 Problem Statement

In the face of the development trend that the world economy is constantly undergoing deep adjustment and China's economy has entered the new normal, if Chinese enterprises want to survive in the fierce market competition and seek development in the current era, they must adjust their business models at all times. In order to meet the new normal of the market, both large and small enterprises need to consider the issue of business models. Only with a business model in line with the market environment, can we help enterprises grow.

Since the 20th century, the rapid development of biomedical industry has brought us into the era of biotechnology. The report of the 18th National Congress of the Communist Party of China clearly puts forward: comprehensively promote the reform of medical service and security, improve the construction of public health management, drug supply and regulatory system, and gradually improve the national health policy. From 2010 to 2018, China's medical market grew at a high speed of "compound growth rate" of 32%, with a total scale of US \$650 billion. Moreover, with the arrival of China's aging society, the medical market and health consumption will usher in a "golden period" of development, which provides good development opportunities for major medical companies.

However, the quality of economic development is worrying, and the disadvantages of extensive growth begin to appear. According to statistics, most industries in our country have the phenomenon of overcapacity, serious homogenization of products, and enterprises win the market through price war, falling into vicious competition. Even the pharmaceutical industry as a high-tech industry has not been spared. Enhance the international competitiveness, and maintain the healthy and sustainable development of the economy, is an important issue facing the Chinese government and enterprises. An important trend of the world economic development is the transition to a service-oriented economy. Recent data show that more than one-third of the world China's large manufacturing enterprises provide out of product services, while in the western economic environment, the proportion has risen to nearly 60%. Another study wrote that for ordinary manufacturing enterprises, service sales

have reached an average of 31%, which confirmed that service activities affect the income of manufacturing enterprises and play an important role in the process of optimization and upgrading of manufacturing industry. At the same time, service logic also benefits from this synthesis, which points out how customer value is converted into profitable business.

1.3 Research Question

(1) To explore the business model research ideas of Chinese pharmaceutical enterprises, analyze the current business model types, and provide reference for further research in the future;

(2) This paper discusses the relationship between business model and performance, and analyzes the effect of business model on business performance, as well as the strategic choice of Chinese pharmaceutical enterprises in the current environment.

1.4 Research Objectives

The theoretical purpose of this study is to study the impact of business model and its antecedents on corporate performance, and to verify it through empirical analysis. This paper defines the concept of business model through literature review, focusing on the relationship among business model, antecedents of business model, enterprise performance and dynamic capability. Therefore, the purpose of this study is to solve the following problems:

1. Business model antecedent research. At present, scholars are keen to study the impact of business model on enterprise performance, but rarely explore the antecedents of business model.

2. Study the impact of business model and its antecedents on business performance.

LITERATUR REVIEW

There are two ways to measure the operating efficiency of an enterprise. One is to reflect the situation of debt paying, profit making, operation and development of an enterprise from the perspective of financial statements. The other is to measure the operating efficiency of an enterprise from the perspective of the market the fluctuation of stock price is positively related to the operation efficiency of enterprises, usually measured by Tobin Q value and market value.

Previous Research

At present, Pang Xueqing (2017), a domestic scholar, believes that enterprise performance describes the business results of the enterprise, including the business status, competitiveness and performance of the management. Yang Xue (2019) believes that in addition to the business results, business performance also includes

various business behaviors related to the results.

Enterprise performance has also become a measure of the success of entrepreneurship, which refers to the operating efficiency of the enterprise within a certain period of operation (He, 2011; Hu, 2015; Lou, 2017). From this point of view, performance is one of the ways to measure the business performance of an enterprise or an organization. Whether it is correct or not is relatively important for an enterprise. Therefore, we need to study how to accurately calculate and express enterprise performance (Murphy, 2016). At present, there are a lot of literatures which only study the influencing factors of enterprise performance.

In many studies, ramanujam (2015) introduced a new non-financial measurement index. They believed that in addition to the financial performance dimension, they could also study from the aspects of the operation effect and the efficiency of the organization. At the same time, Slevin (2017) pointed out the multidimensional problem of enterprise performance dimension, and proposed that enterprise performance is measured by growth dimension and profitability dimension. Borman (2016) analyzed corporate performance from the perspective of task performance and relationship performance. At the same time, Lumpkin (1996) also believed that financial performance and growth performance represent two aspects of corporate performance, and they should be combined to reflect corporate performance. Chrisman (2018) followed the research results of Lumpkin (1996), and verified whether these two indicators can measure enterprise performance well from the perspectives of survival and growth. Web (2015) demonstrates the relationship between corporate growth performance and financial performance. They believe that effective growth will perform in terms of financial performance, and the growth of financial performance also provides more support for corporate growth. Shepherd (2014) pointed out that since enterprises are likely to sacrifice long-term growth for short-term profits, we should integrate different dimensions of enterprise performance.

On the domestic side, Zhang Yuan (2017) proposed a financial evaluation index system consisting of six indexes: return on net assets, main profit rate, synchronous growth rate of main income and main profit, and acceleration rate of capital turnover (Rong & Feng, 2013; Rodrigues Junior, Hein, Wilhelm & Kroenke, 2015; Liu, 2016; Chen, Wu, & Yang, 2017). Li Bo (2017) proposed that enterprise performance should include result oriented performance and behavior oriented performance. Liu Gang (2017) proposed to divide enterprise performance into two dimensions: business performance and management performance.

Technological Innovation

Definition

Technological innovation refers to the change in the production process or the

introduction of new products, so that the same batch of input can get more or more progressive output.

Previous Research on Relationship with DV

Technological innovation is reflected in the fact that enterprises can create new value for current customers, gain premium ability by providing value-added products / services, and obtain higher financial performance and non-financial performance (Hu, 2012; Zhang, 2016; Guo & Li, 2017; Liu & Mao, 2018; Yuan, Ran, Zhang & Yang, 2018) (customer loyalty, corporate reputation, etc.). Christensen et al. (2016) found that the degree of technological innovation will affect customer's acceptance time of new products to a certain extent. In technological innovation, new technologies adopt different working principles compared with the original technologies, so that product performance can be fundamentally improved, and customer value can be greatly improved. With the introduction of such new technologies, products can quickly get customer response, so that new technologies The first adopters of the technique quickly occupied the market.

Thomond (2018) studies that disruptive technology innovation needs to break the original technology paradigm and establish a new technology trajectory compared with improved technology innovation. The value added by this new technology will not only cause competition in the current market, but also attract the attention of potential competitors. In the process of forming the new value creation system, the leading ability of the incumbent enterprises to the supply chain will gradually lose, and even be replaced by the rivals. Therefore, technological innovation will make enterprises pay more attention to the establishment of strategic partnership and strategic alliance, integrate resources and relationships in the supply chain through reasonable positioning, and maintain their competitive advantage.

Sainio (2019) analyzed the empirical case study of Bluetooth technology and grid computing technology on communication operators, and constructed the theoretical framework of the impact of technological innovation on the business model of enterprises. This paper explains the impact of breakthrough technology innovation on enterprises from two aspects inside and outside enterprises, including that technology innovation increases the value of customers in mobile communication, opens up a new market space for enterprises outside the existing market, and at the same time, the potential damage of technology innovation will affect the existing revenue model of enterprises. Therefore, technology innovation is of great significance to the strategic planning of enterprises.

Valerie Chanal (2018) believes that technological innovation will bring changes to the business model of enterprises. In the research, scenario method is used to analyze the impact of different degrees of technological innovation on various elements of business model strategy, organization and operation level, such as adjustments in customer value, sales channels, revenue model, process architecture, resource

acquisition, etc., and how to combine elements in different application fields through technological innovation scenarios to form a new business model Discussion. Justin (2017) proposed that the application of new technology in technological innovation has expanded the space of customer value. It is necessary for enterprises to adjust and reposition their business model, improve the organization and structure of internal value creation through innovation at the level of customer value, so that enterprises can obtain higher profits and be in a favorable position in the competition. Adamantia (2016) believed that technological innovation affected the innovation of enterprise value activity system. Through the adjustment in infrastructure, human resources, technological development, procurement, production, marketing / service, key resources and processes were integrated and optimized in the value chain and the existing cost structure and profit model were improved to improve performance. For example, business outsourcing is a typical form of cost structure transformation. This kind of innovation makes the dynamic enterprise boundary phenomenon more common, and provides opportunities for enterprises to create value and continue to make profits across organizations (Xia, Jia, & Feng, 2016; Jiang, Ji & Huang, 2016; Wang, Ma & Li, 2017; Wu, 2017).

Key Resources

Definition

Key resources are the result of the long-term evolution of an enterprise in a certain environment, and also the result of the interaction between internal resource elements and external environment. Therefore, in order to study the mechanism of key resources and the growth performance of cluster enterprises, it is necessary to understand the different characteristics of key resources and non-cluster enterprises in the background of industrial cluster.

Previous Research on Relationship with DV

Brush et al. (2018) pointed out that key resources have a positive effect on performance, but with regard to different dimensions of resources and under different circumstances or strategies, the combination of material resources and technical resources can significantly promote the improvement of enterprise performance, and can become the core competence foundation of enterprises.

Based on a survey of 262 enterprises in China, Luo (2016) studied the direct, correlation and synergy effects between customer relationship, business partnership and government department relationship and enterprise performance, and pointed out that relationship resources can broaden channels for enterprises to obtain human, material and financial resources, obtain market opportunities and reduce costs, and help enterprises to compete with suppliers The research results show that relationship resources can promote the optimization of enterprise value system.

Xia Qinghua (2016) conducted a survey of 185 enterprises in Guangzhou. They regarded the ability of enterprises to obtain resources through vertical, horizontal and social contacts as organizational resources. The results show that organizational resources can improve the position of enterprises in the supply chain and enhance the voice of leading enterprises.

Gulati (2015) explained the impact of key resources on business performance from the perspective of strategic network. Their research shows that different enterprises have different resources and different capabilities of managing relationship networks. Through the exchange and sharing among enterprises, the efficient use of resources can be realized, which has an impact on enterprise performance.

Yang Xiruo (2017) pointed out that resources are the basis of enterprise value creation activities, and the way of resource allocation determines the positioning of enterprises in the value chain. Business model is a function of enterprise value chain or value chain system. In order to create and realize customer value, an enterprise allocates the internal and external resources it owns or controls effectively, and the integration of resources and resources determines the evolution form of business model, that is, an enterprise changes its original value chain positioning through the effective integration of internal and external resources, and then establishes a new cost structure Revenue model is different from the previous business model.

Intermediate Variable: Business Model

Definition

Among the definitions of many business models, Amit (2012) defines the business model as "an interrelated and interdependent activity system, which determines the way the enterprise and its customers, partners and suppliers do things." That is, the business model is a set of special activities - an activity system - to meet the needs of the understood market, activities that are consistent with the special needs of partners (companies or partners), and how these activities are connected with each other. According to Teece (2016), "business model explains logic, data and other evidences to support customer China's value proposition, feasible revenue structure and the cost of value transfer of enterprise".

Therefore, as mentioned above, this study proposes:

H1: Technological innovation has a significant positive impact on business model

H1a: Technological innovation has a significant positive impact on customer value

H1b: Technological innovation has a significant positive impact on internal value

H1c: Technological innovation has a significant positive impact on cooperation

value

Impact of key resources on business model

According to the resource-based theory, the significance of enterprise existence lies in the combination of all kinds of resources and capabilities inside and outside the enterprise, in order to achieve the provision of market value below the market transaction cost, and to obtain economic rent. The heterogeneity of competition is the basis of the resource-based theory, which holds that the internal resources of a company are of great significance for the company to gain profits and maintain its competitive advantage. Physical resources and financial resources constitute the basis of the company China's competitive advantage and sustainable performance.

Therefore, this paper makes the following assumptions:

H2: Key resources have a significant positive impact on business model

H2a: Key resources have a significant positive impact on customer value

H2b: Key resources have a significant positive impact on internal value

H2c: Key resources have a significant positive impact on cooperation value

METHODOLOGY

According to the definition of business model in this study, the core of business model is value creation. There are not many existing research results on the measurement of business model. This paper adopts the measurement scale of three-dimensional value composition of business model proposed by Harvard University Professors Mark Johnson, Clayton Christensen and heiming Kagermann (2009), as shown in table 3.1. The scale describes business model from three dimensions of customer value, internal value and cooperation value. It is not only universal, but also has high reliability and validity verified by Dr. Wen Liang.

Table 3.1 Business Model Measurement Scale

dimension	Item description
Customer value (CV)	Provide customers with high-quality products, reasonable prices, timely and convenient services, high customer satisfaction and loyalty
Internal value (IV)	Fast response to customer demand resources and capabilities efficient allocation of core competitiveness of enterprises
Cooperative	The supply chain revenue of enterprises with extensive cooperative

value (SV)	relationship accounts for a large proportion of the whole industry revenue, and the enterprises have a great influence on the supply chain
---------------	--

Enterprise performance

Enterprise performance is the explained variable in the model. Zott C, Amit (2007) try to measure the performance of an enterprise from six aspects: growth, profitability and overall success. Lane, Salk and Lyles (2001) think that the measurement of enterprise performance should include qualitative performance indicators and quantitative performance indicators. Qualitative performance indicators refer to indicators that cannot be simply and directly quantified (such as performance comparison with similar enterprises, market competition advantage, etc.), while quantitative indicators are indicators that can be directly described by digital quantification, such as profit rate, growth rate, etc. In addition, in order to avoid the one sidedness of single year performance data, there are many methods to measure enterprise performance level in a certain period of time

Table 3.2 Enterprise Performance Measurement

dimension	Item description
Financial performance (FP)	Compared with peers, the sales volume of the company has increased rapidly in recent two years Compared with peers, the return on investment of the company has increased Compared with peers, the company has a higher profit margin
Market performance (MP)	The market share of the company has increased rapidly in recent two years The company has continuously launched new products / services in recent two years Compared with peers, the company has a strong market competitiveness in product use and service

Combined with the above scholar's measurement of enterprise performance, this paper uses six items to measure enterprise performance, including financial indicators (sales volume, profit rate and return on investment) and market indicators (market share growth, new products / services and market competitiveness) as the measurement indicators of enterprise performance (table 3.2).

Pretest and Correction of Scale

From September 15, 2018 to November 20, 2019, a total of 410 questionnaires were distributed to 120 enterprises nationwide, 372 of which were recovered, with a recovery rate of 90.73%. In addition, the research group screened the returned questionnaires and eliminated the unqualified ones, including the phenomenon of many missing answers in the questionnaires, the unclear answers to the questionnaires, the incomplete demographic variables of the questionnaires, and the obvious same handwriting of the questionnaires collected by the same enterprise. Finally, 344 valid questionnaires were obtained, with an effective recovery rate of 83.9%.

Reliability analysis

Through the sample data, Cronbach α coefficient and CITC coefficient are used to test the internal consistency of business model measurement scale.

Table 3.3 Internal Consistency Analysis of Business Model Scale

dimension	Item code	CITC	Alpha if Item eleteded	Cronbach alpha
CV	CV1	0.596	0.741	0.851
	CV2	0.624	0.753	
	CV3	0.678	0.745	
IV	IV 1	0.738	0.822	0.913
	IV2	0.726	0.819	
	IV3	0.709	0.751	
SV	SV1	0.723	0.819	0.322
	SV2	0.703	0.790	
	SV3	0.764	0.854	

It can be seen from table 3.3 that the lowest Cronbach α coefficient of the three dimensions of the business model measurement scale is 0.851, which meets the minimum standard of 0.70 required by the internal consistency test, and the CITC value of each item in the scale far exceeds the standard of 0.50. At the same time, if a measurement item in the scale is deleted, the Cronbach α coefficient of the corresponding concept will be reduced, so the business model measurement scale will reduce the Cronbach α coefficient the model measurement scale has a good internal

consistency reliability, and all items should be retained.

Table 3.4 shows the internal consistency analysis results of the enterprise performance scale. It can be seen from the results that the Cronbach α coefficient of the enterprise performance measurement scale is 0.876 at least, which also exceeds the minimum standard is 0.70, and the CITC value of each item also exceeds the standard of 0.50. For the measurement items in the scale, if one of them is deleted, the Cronbach α coefficient of the corresponding concept will be reduced Low, which indicates that the enterprise performance measurement scale has good internal consistency, and all items in the measurement table should be retained.

Table 3.4 Internal Consistency Analysis Results of Enterprise Performance Scale

dimension	Item code	CITC	Alpha if Item Deleted	Cronbach alpha
FP	FP1	0.751	0.859	0.876
	FP2	0.702	0.765	
	FP3	0.688	0.753	
MP	MP1	0.723	0.847	0.902
	MP2	0.667	0.717	
	MP3	0.732	0.811	

Validity analysis

In order to test the validity of the scale for research questions, the content validity and structure validity of the scale should also be examined.

Table 3.5 Results of Exploratory Factor Analysis of Business Model

Item	Factor 1	Factor 2	Factor 3
CV1	0.691	0.132	0.025
CV2	0.715	0.265	0.157
CV3	0.695	0.223	0.084
EV 1	0.143	0.779	0.228
EV2	0.230	0.785	0.258

EV3	0.022	0.682	0.109
SV1	0.123	0.212	0.634
SV2	0.176	0.282	0.711
SV3	0.205	0.154	0.698

Content validity refers to the appropriateness of the content of the scale and the consistency with the research issues, generally using qualitative methods for analysis. In this study, the content of the scale was reviewed by professionals to ensure the content validity of the two scales: business model and business performance. In this study, exploratory factor analysis is used to test the structural validity of the scale. The results of exploratory factor analysis of the business model scale are shown in table 3.6. The results show that there are three factors with eigenvalues greater than 1 in the scale, i.e. CV 1-cv3 has a common factor, ev1-ev3 has a common factor, and sv1-sv3 has a common factor. There is no cross load on the three factors of each item, so it is decided to keep the original item.

The exploratory factor analysis results of the enterprise performance scale are shown in table 3.7. The results show that there are two factors whose eigenvalues are greater than 1, that is, fp1-fp3 has a common factor, and MP 1-mp3 has a common factor. There is no cross load on the two factors of each item, so it is decided to keep the original item. The pre-test results show that the business model and enterprise performance measurement scale have good reliability and validity. Therefore, all items of the business model and enterprise performance measurement scale in the questionnaire are retained for the subsequent structural model test.

Table 3.6 Results of Exploratory Factor Analysis of Enterprise Performance

Item	Factor 1	Factor 2
FP1	0.693	0.113
FP2	0.607	0.165
FP3	0.713	0.213
MP1	0.231	0.598
MP2	0.125	0.661
MP3	0.232	0.609

Internal Consistency Analysis

Reliability analysis is mainly to test whether the scale has stability and consistency when measuring related variables. The test of internal consistency reliability is mainly carried out through two indicators, the two indicators are the overall correlation coefficient of project one, CITC and Cronbach α coefficient. In this study, Cronbach α coefficient (q-coefficient for short) is used to evaluate the internal consistency of multi-dimensional scale. Cronbach α coefficient reflects the correlation between different items under the same variable in the questionnaire, and is widely used to evaluate the internal consistency of multi-dimensional scale. Internal consistency is an important content of reliability analysis, and this index has been proved to be very effective in evaluating the internal consistency of multidimensional scale. It reflects the degree of correlation between items or items in the questionnaire. These items should reflect different aspects of the same independent concept.

Table 3.9 Descriptive Statistical Analysis of Item Data

dimension	project	mean value	standard deviation
		Statistics	Statistics
Technological innovation TI	TC1	3.62	1.122
	TC2	3.79	1.029
	TC3	3.68	0.944
	TC4	3.83	1.072
Key resources ER	ER1	3.71	0.971
	ER2	3.47	0.99
	ER3	3.83	1.072
	ER4	3.68	0.843
	ER5	4.22	0.954
	ER6	3.83	1.066

In this study, the principal component analysis method is used to intercept the data according to the standard of eigenvalue 1, and the orthogonal rotation method of maximum variance is used. The statistical results are shown in table 3.12.

Table 3.12 Exploratory Factor Analysis of Business Model Antecedents

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
TI1	0.445	0.693	0.034	0.088	0.025	0.125
TI2	0.258	0.607	0.316	0.102	0.105	0.085
TI3	0.335	0.598	0.308	0.147	0.188	0.242
TI4	0.302	0.661	0.278	0.058	0.210	0.266
ER1	0.212	0.024	0.268	0.697	0.115	0.223
ER2	0.126	0.302	0.242	0.805	0.141	0.096
ER3	0.089	0.232	0.202	0.654	0.058	0.123
ER4	0.147	0.165	0.269	0.733	0.055	0.212
ER5	0.201	0.189	0.198	0.634	0.105	0.015
ER6	0.262	0.147	0.301	0.553	0.241	0.077
OS1	0.132	0.258	0.025	0.202	0.613	0.132
OS2	0.130	0.263	0.014	0.276	0.604	0.352
OS4	0.161	0.205	0.011	0.132	0.560	0.166

In this study, six factors with eigenvalues greater than 1 were extracted, which accounted for 67.33% of variance variance changes. The factor load of each item in a single dimension was greater than 0.5, indicating that the measurement scale had good convergence validity and single dimension. In addition, there is no cross loading phenomenon, indicating that there is a certain degree of validity between dimensions. In this way, through a small sample pre-test, this study tests the reliability and validity of each measurement item of the business model antecedent variables, delete the individual items that do not meet the requirements, and obtain a business model antecedent variable measurement questionnaire including 23 items in 3 dimensions. This study is based on the 23 items mentioned above, and the items related to the statistical variables of enterprises are added. Finally, the cost study is used for the questionnaire of large-scale formal survey.

ANALYSIS

Profile of Respondents

The research survey started from September 15, 2018 and ended on November 20, 2019. A total of 410 questionnaires were issued by 120 companies nationwide, and 372 were recovered with a recovery rate of 90.73%. The research team also screened the returned questionnaires to eliminate unqualified questionnaires. Including the phenomenon of multiple missing answers in the questionnaire, the answering of the questionnaire is not clear, the demographic variable part of the questionnaire is not filled in at all, and the questionnaire written by the same company is obviously the same. Finally, 344 valid questionnaires were obtained, and the effective recovery rate was 83.9%. The basic situation of the sample is shown in Table 4-1.

Table 4-1 Sample Description Statistics

Descriptive Indicators		Proportion	Descriptive Indicators		Proportion
Gender	Male	61.3%	Number of Workers	<100	27.8%
	Female	38.7%		101-200	40.3%
Age	<30	23.5%		201-500	22.1%
	31-40	24.8%		500-1000	17.4%
	41-50	18.9%		>1001	11.6%
	>51	32.8%	Business Nature	State-owned Enterprise	32.8%
Position	Chairman	12.9%		Private Enterprise	35.2%
	General Manager	27.8%		Foreign owned	22.2%
	Department Manager	39.3%		Joint Venture	15.3%
	Business Executives	20.0%	Listed Enterprises	13.7%	
Years of Establishment	<2	17.4%			
	3-5	14.8%			
	6-10	31.5%			
	11-15	22.4%			
	>16	13.9%			

Table 4-2 Descriptive Statistics of Business Model Related Items

Code	Number of Samples	Average	Standard Deviation	Skewness		Kurtosis	
				Average	Standard Deviation	Average	Standard Deviation
CV1	344	4.03	0.918	0.109	0.119	-0.1041	0.237
CV2	344	3.85	0.805	0.131	0.119	-0.606	0.237
CV3	344	3.69	0.957	-0.233	0.119	-1.338	0.237
EV1	344	3.95	0.904	0.092	0.119	-1.270	0.237
EV2	344	3.13	0.864	0.177	0.119	-1.339	0.237
EV3	344	3.53	0.943	-0.171	0.119	-1.239	0.237
SV1	344	3.64	0.944	-0.102	0.119	-1.239	0.237
SV2	344	3.18	0.943	-0.231	0.119	-0.938	0.237
SV3	344	3.68	0.871	0.255	0.119	-1.338	0.237

Table 4-3 Descriptive Statistical Results of Business Performance Items

Code	Number of Samples	Average	Standard Deviation	Skewness		Kurtosis	
				Average	Standard Deviation	Average	Standard Deviation
FP1	344	3.04	1.156	0.003	0.119	-0.747	0.237
FP2	344	3.04	1.156	0.003	0.119	-0.747	0.237
FP3	344	3.69	0.932	-0.725	0.119	-1.874	0.237
MP1	344	3.73	0.960	-0.765	0.119	-1.480	0.237
MP2	344	3.72	0.834	-0.017	0.119	-1.421	0.237
MP3	344	3.64	0.965	-0.113	0.119	-1.546	0.237

The descriptive statistical analysis of the business model and scale is shown in Table 4-2. The average data of each item in the business model scale is between 3.13 and 4.03, and the standard deviation ranges from 0.805 to 0.957. The absolute value is less than 3 and the absolute value of the kurtosis index is less than 10, which indicates that the data of each measurement item of the business model obey the normal distribution.

The data description statistics of each item of business performance are shown in Table 4-3. The results show that the average of the data of each item is between 3.04 and 3.73, and the standard deviation ranges from 0.834 to 1.156. The absolute value is less than 3 and the absolute value of the kurtosis index is less than 10, which indicates that the data of each measurement item of business performance can follow a normal distribution.

Hypothesis

1. The impact of customer needs on business models

H1: Customer demand has a significant positive impact on the business model

H1a: customer demand has a significant positive impact on customer value

H1b: Customer demand has a significant positive impact on internal value

H1c: Customer demand has a significant positive impact on the value of cooperation

2. The impact of technological change on business models

H2: Technology change has a significant positive impact on business models

H2a: Technology change has a significant positive impact on customer value

H2b: Technology change has a significant positive impact on internal value

H2c: Technology change has a significant positive impact on the value of cooperation

Research Objective 1 (R.O.1): Impact of Business Model Antecedents on Business Model

Dimensions of Business Model

This study believes that the business model is a value creation method that exists objectively under the conditions of certain external environment and internal resource capabilities, and value creation is its core function. Many scholars have put forward a similar point. Rappa (2009) believes that the most fundamental connotation of a business model is the method by which a company runs a business in order to maintain itself and earn enough profits. Amit et al. (2002) pointed out that the business model is a combination of trading activities designed to create value in the process of expanding business opportunities. Through empirical research, they found that the value creation of enterprises has four driving factors: novelty, lock-in, complementarity and efficiency. Chesbrough et al. (2002) believe that the business model is a rational income structure established by enterprises in order to obtain value from technology, and the purpose is to maximize the value provided by technology. Afuah et al. (2001) believe that the function of the business model is that enterprises acquire and use resources to create more value for customers than competitors to

make profits. Linder et al. (2001) explained the actual process of business model value creation in a case form, while Petrovic et al. Respectively explained the principle process of business model value creation. Currently more common is the three-dimensional division based on Porter's strategic positioning theory. That is, the business model is divided into three dimensions of value proposition, value proposition object, and value submission method from the three aspects of the product or service type, customer demand, and contact channel, as shown in Figure 4-6. Each dimension can be divided into different ways, that is, the object of the value proposition is the enterprise and the individual, and the content of the value proposition includes four actual types: material products, material services, information products, and information services. The value submission method is divided into traditional physical method and modern network method. The combination of the above 3 dimensions and a total of 8 elements can finally form 16 basic business model types.

The core of the business model concept is value creation and value transmission across organizational boundaries, emphasizing the essential characteristics of the value of the business model and its transformation process across boundaries. Therefore, this paper adopts the three-dimensional model of the business model proposed by He Wenliang, etc., which is referred to as the Mark Johnson business model model later. Its dimensions and specific meanings are shown in the table.

1. Customer Value

Customer value refers to the extent to which an enterprise provides physical products and services to customers and the extent to which the offering can be accepted by customers in order to achieve profitability in market transactions. It includes what specific products or services are provided to target customers, the functions of these products or services are in accordance with the needs of customers, and how satisfied customers are in providing and using the products or services.

2. Internal Value

Internal value refers to the need for enterprises to plan and design processes such as product development, manufacturing, and marketing in order to create value and deliver value, thereby improving operational efficiency and profitability. Including the level of investment in key resources and processes, the type, quantity and quality of products and services, the degree of customization to customer needs, operating costs and expenditure structure, internal value is reflected in value conversion efficiency and profitability.

3. Cooperation Value

The value of cooperation refers to the mobilization of external resources by enterprises to give play to their advantages in the process of value conversion, to achieve resource integration, and to maintain competitive advantages through external

collaboration. Including the establishment of vertical or horizontal cooperation alliances with members of the supply chain, in product development, raw material supply, manufacturing collaboration, market channels and customer information sharing. Cooperate and play a leading role to improve the overall operating efficiency of the supply chain.

The customer value of the three dimensions of the business model reflects what characteristics of the product or service the company provides to meet customer demand and explains the company's source of income. Internal resources and capabilities are the resources and capabilities needed to run an enterprise's business systems, and they are the source of a company's sustainable competitive advantage. Cooperation value reflects the status of the enterprise in the value chain or value network, and it determines the value of the value that the enterprise can obtain.

Table 4-4 Dimensional Composition of Mark Johnson's Business Model

Dimension	Content Description
Customer Value	Customer acceptance of the product or service provided by the company and the degree of realization of expectations
Internal Value	Specific business models that support customer value propositions and profit models
Cooperation Value	The value of the supply chain and its influence in the supply chain

Correlation Analysis

Correlation analysis refers to the analysis of two or more variable elements with correlation, to measure the closeness of the correlation of each two variable factors. Before performing structural equation model analysis, it is necessary to test the correlation between the variables in the research model. Only through the correlation test can the relationship between the variables in the model be studied. Therefore, correlation analysis is the basis of model testing. Table 4.19 shows that there is a good correlation between business models and their antecedent variables and business performance.

Correlation analysis is a preliminary test of the research model. Although it reflects the closeness of the variables, it is not clear how much the specific relationship is. The variables will be incorporated into the structural equations later, and they will be further verified and analyzed.

Table 4-5 Correlation Analysis of Model Variables

	CD	TC	CI	ER	OS	ES	CV	EV	SV	FP	M P
C D	1										
T C	0.36 **	1									
CI	0.24 **	0.41 **	1								
E R	0.33 **	0.63 **	-0.33 **	1							
O S	0.23 **	0.25 **	-0.27 **	0.51 **	1						
E S	0.34 **	0.39 **	0.17* *	0.47 **	0.34 **	1					
C V	0.42 **	0.51 **	0.07* *	0.65 **	0.11	0.22 **	1				
E V	0.33 **	0.18 **	-0.23 **	0.63 **	0.19 **	0.35 **	0.44 **	1			
S V	0.32 **	0.23 **	0.19* *	0.36 **	0.23 **	0.20 **	0.23 **	0.33 **	1		
FP	0.42 **	0.40 **	-0.33 **	0.41 **	0.29 **	0.40 **	0.34 **	0.38 **	0.32 **	1	
M P	0.38 **	0.35 **	-0.30 **	0.38 **	0.32 **	0.31 **	0.41 **	0.47 **	0.35 **	0.38 **	1

Structural Equation Model Construction and Analysis

Structural Equation Modeling (SEM) is a statistical data analysis tool formed by a combination of multiple regression analysis, path analysis, and confirmatory factor analysis methods. It can analyze the complex causality between multiple dependent variables and multiple independent variables. In the structural equation analysis, the covariance matrix of the sample data is used to fit the theoretical model, and the initial model is evaluated and modified to obtain the optimal model with the smallest fitting deviation. Especially with the use of professional software such as LISREL and

AMOS, structural equation analysis has become a powerful tool for solving complex and multivariate relationships in social science data.

SEM is composed of a measurement model and a structural model. The measurement model describes the relationship between the explicit and latent variables and indicates which observation variables are used to measure a latent variable. Structural model describes the relationship between latent variables. It is a group of models like multiple regressions that describe the quantitative relationship between exogenous and endogenous variables. The measurement model and the structural model are logically inseparable. The research hypothesis of the verification is mainly reflected in the structural model part, similar to the multiple regression analysis of the independent variable's influence on the dependent variable. Structural equations deal with latent variables and cannot be directly measured, so a process of variable design is needed to gradually convert from conceptual variables to operational variables. The measurement model is exactly what describes this variable design process.

Table 4-7 Path Analysis of Initial Research Model M1

Hypothesis	Relationship	Normalized Path Factor	T Value	Whether Significant	Hypothesis Test Results
H1a	CV-CD	0.39***	5.43	Yes	Support
H1b	EV-CD	0.32***	5.89	Yes	Support
H1c	SV-CD	0.18	1.15	No	Not Support
H2a	CV-TC	0.24***	2.66	Yes	Support
H2b	EV-TC	0.24***	2.68	Yes	Support
H2c	SV-TC	0.19**	2.15	Yes	Support

CONCLUSION

1. For the listed pharmaceutical companies in China, their business models have the following characteristics in terms of performance: External similarity, internal form diversification, emphasis, similarity difference and internal connection (Cielik, Kaciak & Welsh, 2012; Guo, 2012; Cai & Dang, 2015; Bao, Cheng & Zhang, 2015; Bai, 2018; Chen & Chen, 2018). These characteristics are determined by the characteristics of Chinese pharmaceutical companies.

(1) The external similarity of business models of enterprises is because Chinese enterprises are often faced with development problems such as small scale,

insufficient funds, weak R & D capabilities, lack of technical content of products, low profitability of enterprises, and imperfect marketing channels. Under similar problems and cruxes, companies' choice of business models will inevitably have a certain degree of consistency (Pradhan, 2003; Kelchtermans, Stijn, Leten, BartBelderbos, & René, 2010; Majumdar, 2011; Feng, Tang & Fu, 2012; Shengxiao, 2013; Zhi-Hua & Rui, 2013; Madian, 2015; Yong, Huan & Jian-Ying, 2017).

(2) Due to the abstractness and broadness of the concept of business model, the specific interpretation of its definition is more diverse. Coupled with the non-standard nature of China's pharmaceutical companies, different operating modes also exist in different links, which makes the business model internally reflect diversified characteristics.

(3) Among the many value activities of an enterprise, due to the imbalance in the allocation of enterprise capabilities and resources in various links. The value created by the enterprise does not come from all links, but from some specific value activities. This also makes the business models of different companies have a certain focus (Gibbons & Henderson, 2012; Xu, 2014; Delft & Kortmann, 2015; Li, 2016; Jiang & Che, 2017; Dai & Zhang, 2018; Zheng, 2018; Zhao, Zhang & Ge, 2019).

(4) The business model is just a means, a method, a set of shapes, without the concept of standards and quantities. Different people use the same business model on different occasions, different companies, or similar companies in a certain link, but they may not achieve the same results (Wu, Zhang & Liu, 2000; Wang, Li & Zhang, 2010; Li & Zhou, 2012; Chen, 2015; Jiang, 2015; Wu, Zhang, Liu & Guo, 2016; Chen, 2016; Polychroniou, Trivellas, & Dahlgard-Park, 2018). In many cases, the effects are even very different, which makes them reflect the characteristics of similar differences.

(5) At the same time, some activities of the business model divided based on the entire value creation process of the enterprise are only different in space and timing. There is a certain degree of consistency, which also leads to a certain internal connection between various business models of the enterprise.

2. From the perspective of the relationship between business models and business performance, there are three matching relationships between high-performance companies' business models. That is, high-performance matches the comprehensiveness of the business model, high-performance matches the suitability of the business model, and high-performance matches the sustainability of the business model. These matching relationships are determined by the characteristics of the business model and business performance.

First, the business model itself is broad, unique, conceptual, and volatile. This makes the business model different from enterprise to enterprise and can also be adjusted quickly as the internal and external conditions of the enterprise change. Secondly, business performance is a systematic project, and its ultimate realization depends not only on theoretical settings, but also on long-term, stable, and reliable execution.

The paper also analyzes the international pharmaceutical industry environment and the domestic pharmaceutical industry environment and makes a strategic explanation of the matching relationship between business performance and business model in China from three aspects (Lin, 2011; Cui & Jiang, 2013; Jian-Li & Bang-Tao, 2014; Li & Ding, 2016; Chang, Feng & Yue, 2017; Zhu, 2018; Zhang, Wei & Zhu, 2019). Business models can affect business performance by affecting their competitive advantage. Business models can affect business performance by affecting their core competencies. Business models can influence business performance by cultivating latecomer advantages. Finally, according to the previous research results of the paper, I put forward my own suggestions on the development strategy of China's pharmaceutical enterprises from the perspective of enterprises and industrial policies (Song, Wang & Wang, 2008; OCDE. 2008; Xiong, 2013; Yu, 2013; Xing, 2014; Zhang & Bian, 2015; Ye & Yang, 2016; Zhang, Wang, & Liu, 2017; Zhu & Du, 2017).

3. Based on the analysis of the existing literature, this study builds a model of the business model's antecedents, business models, and business performance, and tests the theoretical model empirically.

REFERENCES

- Ahmed, A., Abouzeedan, A., Klofsten, M., & Hedner, T. (2012). Implementing the six model on an intensively innovation-oriented firm: the case of autoadapt ab. *World Journal of Entrepreneurship, Management and Sustainable Development*, 8(2/3), 122-145.
- Al-Mobayed, A. (2012). The effect of innovation through r&d expenditure on the competitive performance of firms.
- Almor, T., Tarba, S. Y., & Margalit, A. (2014). Maturing, technology-based, born-global companies: surviving through mergers and acquisitions. *Management International Review*, 54(4), 421-444.
- Arvanitis, S., Sydow, N., & Wörter, Martin. (2005). Is there any impact of university-industry knowledge transfer on the performance of private enterprises? an empirical analysis based on swiss firm data. *Kof Working Papers*, 11(3), 267-285.
- Azari, M. J., Madsen, T. K., & Moen, K. (2017). Antecedent and outcomes of innovation-based growth strategies for exporting smes. *Journal of Small Business and Enterprise Development*, JSBED-08-2016-0125.
- Bai, J. B. (2013). Analysis of the impact of government science and technology policy on the innovation performance of the pharmaceutical manufacturing industry. *Chinese Journal of New Drugs and Clinical Medicine*, (06), 32-37.

Bai, X. (2018). Impact of the business model of the home appliance industry on corporate performance. *Guangxi Quality Supervision Guide*, 213 (09), 75.

Bao, Y., Cheng, L., & Zhang, J. (2015). Organizational Learning, Strategic Flexibility and Business Model Innovation: An Empirical Research Based on Logistics Enterprises. *Proceedings of the 2015 International Conference on Applied Mechanics, Mechatronics and Intelligent Systems (AMMIS2015)*.

Beleska-Spasova, E., Glaister, K. W., & Stride, C. (2012). Resource determinants of strategy and performance: the case of british exporters. *Journal of World Business*, 47(4).

Ben, Y. H. (2017). A Study on the Impact of Chinese Enterprises' R & D Investment on the Lagging of Operating Performance - A Case Study of Pharmaceutical Manufacturing Enterprises. *Price Theory and Practice*, (04), 157-160.

Bouwman, H., Nikou, S., Molina-Castillo, F. J., & Reuver, M. D. (2018). The impact of digitalization on business models. *Digital Policy, Regulation and Governance*.

Cai, J. Y., & Dang, X. H. (2015). Research on the Impact of Business Model Innovation on Financial Performance: Empirical Research Based on Emerging Technology Enterprises. *Operations Research and Management*, (02), 276-284.

Chang, H. Y., Feng, L. J., & Yue, J. J. (2017). The mechanism of business model innovation and business performance for bop market. *Business Economy*, (07), 136-142.

Chen, J. Y. (2015). Research on the relationship between business model design and startup performance: Moderating effects of environmental friendliness and absorptive capacity. Doctoral dissertation, Zhejiang University.

Chen, J., Guo, Y., Huang, S., & Zhu, H. (2011). The determinants of the choice of innovation source for chinese firms. *International Journal of Technology Management*, 53(1), 44.

Chen, K., & Fang, Z. X. (2009). Research on the correlation between intangible assets and corporate performance of listed companies in the pharmaceutical industry. *Mass Commerce: Second Half of the Month*, (10), 114-114.

Chen, LP, & Chen, J. (2018). Empirical Research on the Impact of Enterprise Business Model Innovation on Competitive Advantages - Taking Dynamic Capabilities as Intermediate Variables. *Journal of Fuzhou University (Philosophy and Social Sciences Edition)*, v.32; No.146 (04), 21-30.

Chen, M. J. (2013). Innovative thinking on business model of pharmaceutical distribution enterprises. *Modern Corporate Education*, (20), 382-382.

Chen, Q. (2010). Design of Enterprise E-commerce Business Model: Antecedents and Performance Results of IT Resources. Doctoral dissertation, Zhejiang University.

Chen, X. (2016). The impact of business models on corporate performance in different contexts. *China Science and Technology Forum*, (12).

Chen, Y. G., Wu, Y. Y., & Yang, Z. (2017). The Impact of Business Model Innovation on Financial Performance: An Integrated Model. *China Science and Technology Forum*, (3).

Chen, Y. J., & Zhu, Y. (2017). Research on the Impact of Internal Control Quality on Corporate Performance of Listed Companies in the Pharmaceutical Industry. *Rural Economy and Science and Technology*, (04), 132-133.

Cheng, K. Q., Liu, W., & Jiang, X. Q. (2019). The impact of executive incentives on the performance of listed companies in the pharmaceutical manufacturing industry. *Journal of Mudanjiang Normal University (Social Science Edition)*, (4).

Cheng, M. T. (2015). Research on the Operational Performance of "Full Industry Chain" Business Model. Doctoral dissertation.

Cielik, J., Kaciak, E., & Welsh, D. H. B. (2012). The impact of geographic diversification on export performance of small and medium-sized enterprises (smes). *Journal of International Entrepreneurship*, 10(1), 70-93.

Clara, R. F., José, G. M., Antonelli, M., Dimopoulos, G., & Cisneros, J. M. (2015). Safety and efficacy of colistin versus meropenem in the empirical treatment of ventilator-associated pneumonia as part of a macro-project funded by the seventh framework program of the european commission studying off-patent antibiotics: study protocol for a randomized controlled trial. *Trials*, 16(1), 102.

Cravo, T., & Piza, C. (2016). The impact of business support services for small and medium enterprises on firm performance in low -and middle- income countries: a meta-analysis. *Small Business Economics*, 141(2), 1-18.

Cui, N., & Jiang, Y. R. (2013). The impact of business model design and strategic orientation on business performance. *Business Economy and Management*, (12), 47-55.

Cui, N., Zhang, LN, & Zhang, J. (2015). Impact of business model innovation on new product performance: the mediating role of resource integration. *Journal of China University of Geosciences (Social Science Edition)*, (05), 96-108.

Cui, SP, Zhang, JY, Yang, J., & Cao, XJ (2015). Environmental uncertainty, business models of strategic emerging companies and innovation investment performance: based on empirical analysis of high-end equipment manufacturing industry. *Science and Technology Progress and Countermeasures (Issue 18)*, 68-74.

Dai, F. (2018). Exploration of a New Human Resource Management Model under the Concept of Sharing Economy——Taking the Pig Platform as an Example. *Journal of Wuxi Vocational and Technical College*, v.17; No.86 (03), 74-77.

Dai, Y. L., & Zhang, W. G. (2018). Dynamic Capabilities, Business Model Innovation and Growth Performance of Startups. *Systems Engineering*, 36 (04), 44-54.

Dan, H. W. (2015). Research on the Impact of China's Pharmaceutical Manufacturing Innovation Concentration on Economic Performance. Doctoral dissertation.

Delft, S. V., & Kortmann, S. (2015). The impact of global knowledge sourcing and ambidextrous capabilities on business model innovation.

Deng, J., Menguc, B., & Benson, J. (2003). The impact of human resource management on export performance of chinese manufacturing enterprises. *Thunderbird International Business Review*, 45(4), 409-429.

Deng, Z. W. (2015). Research on the Impact of R & D Expenditure on Corporate Performance in Biopharmaceutical Enterprises. Doctoral dissertation.

Ding, F. (2019). Research on R & D Investment and Performance of Chinese Pharmaceutical Industry Enterprises. Doctoral dissertation.

Djaja, I., & Arief, M. (2015). The impact of dynamic information technology capability and strategic agility on business model innovation and firm performance on ict firms. *Advanced Science Letters*, 21(5), 1225-1229.

Dolores Añon Higon, Antolin, M. M., & Juan A. Mañez. (2010). Multinationals, r&d and productivity: evidence for uk manufacturing firms. *Industrial and Corporate Change*, 20(1110), 641-659(19).

Fan, X., & Lu, Y. (2016). *Business Model Innovation of Enterprises Based on the Bottom of Pyramid (BoP) Market Strategy. Proceedings of 2015 2nd International Conference on Industrial Economics System and Industrial Security Engineering*. Springer Singapore.

Fang, Z., & Zhang, H. R. (2014). The Impact of Ecological Business Models of Creative Industries on Enterprise Performance. *Discussion of Modern Economy*, (5), 58-62.

Feng, M. J., Tang, H., & Fu, L. Y. (2012). Intellectual property management and performance analysis of pharmaceutical companies: based on the survey of national high-tech development zones. *Science and Technology Progress and Countermeasures*, 29 (3), 104-109.

Feng, Q. L. (2017). Research on the relationship between business model and financial performance of China-ASEAN Free Trade Area. *Modernization of Shopping Malls*, (8), 24-25.

Feng, Y. W. (2015). Research on the impact of pharmaceutical corporate social responsibility on corporate performance. Doctoral dissertation, Southwest University.

Fu, L., & Deng, X. (2016). Research on the Impact of Venture Capital on the Performance of Pharmaceutical Manufacturing Enterprises. *Journal of Jiangxi University of Science and Technology*, (2), 36-40.

Gao, S. H., & Fan, Y. D. (2014). Empirical Research on the Impact of Social Responsibility of Pharmaceutical Listed Companies on Operating Performance. *Business Accounting*, (4), 66-68.

Ge, LF, Zhang, XL, & Zhao, Y. (2014). Steady-state, incremental characteristics, and corporate performance of business models: an empirical analysis based on data from 330 companies in Jiangsu. *Technology and Innovation Management, International Business Negotiation Session*.

Gibbons, R., & Henderson, R. (2012). Relational contracts and organizational capabilities. *Organization Science*, 23(5), 1350-1364.

Gong, Y. (2015). Business Model Innovation: Taking Dekang Medical as an Example. *President of Chinese Hospital*, (7), 89-89.

Guan, J., & Chen, X. F. (2014). Empirical Research on the Impact of Social Responsibility of Pharmaceutical Companies on Benchmarking Performance. *Technology Economy*, (5), 102-111.

Guan, Y. J. (2015). The impact of the combination of product innovation and business model innovation on enterprise performance in emerging technology companies. *China Science and Technology Forum*, (8), 78-85.

Guo, H., & Shen, R. (2014). How to turn entrepreneurial opportunities into corporate performance: the mediating role of business model innovation and the regulating role of market environment. *Economic theory and economic management*, (03), 72-85.

Guo, J. J., & Chen, Q. (2014). Research on the Impact Mechanism of E-commerce Business Model Design on Enterprise Performance. *Journal of Management Engineering*, 28 (3), 83-90.

Guo, T., Wu, Y., & Liu, H. D. (2017). Empirical Research on the Impact of Entrepreneur Background Characteristics on the Performance of Technology Startups—The Mediating Role of Business Model Innovation. *Science & Technology Progress and Policy*, (5).

Guo, X. D. (2012). Empirical Research on the Relationship between Business Model Innovation, Core Competitiveness and Performance - Taking Law Firms as Examples. *China Collective Economy*, (27), 40-41.

Guo, Y. J., & Li, P. L. (2017). Research on the Impact of Technological Innovation on the Performance of Listed Pharmaceutical Manufacturing Companies. *China Market*, (36), 106-107.

Hall, B. H., Helmers, C., Juster, T., & Sena, V. (2013). *The importance (or not) of patents to uk firms*. Social Science Electronic Publishing, 65(3), 603-629.

Han, Y. F. (2015). An Empirical Analysis of the Impact of Corporate Governance Structure on Performance - Taking Chinese Pharmaceutical Manufacturing Listed Companies as Examples. *China Township and Village Enterprise Accounting*, (04), 142-144.

Hao, Z., Shiquan, W., Chong, X., & University, N. (2014). The influences of ceo's attention on innovation performance in stated owned enterprises. *Chinese Journal of Management*.

He, D. (2018). The influence mechanism of e-commerce business model design on corporate performance. *Shanxi Agricultural Economics*.

He, Y. Q. (2011). Business Model and Enterprise Performance: Research Status and Development. *Journal of Beijing Institute of Economic Management*, 26 (4), 32-36.

Heneric, O., Engel, D., & Champenois, C. (2004). The birth of german biotechnology industry: did venture capital run the show? *Ssrn Electronic Journal*.

Hock, M., Clauss, T., & Schulz, E. (2016). The impact of organizational culture on a firm's capability to innovate the business model. *R&D Management*, 46(3), 433-450.

Hong, J., Yang, N. N., & Yang, Y. (2018). The Impact of Business Model Design on the Innovation Performance of Startups. *China Science and Technology Forum*.

Hu, B. L. (2012). The relationship between business model innovation, technological innovation and corporate performance: an empirical study based on GEM listed companies. *Science & Technology Progress and Policy*, (03), 101-106.

Hu, B. L. (2013). Research on the mechanism of business model affecting innovation performance: the mediating role of knowledge search. *Science & Technology Progress and Policy*, 30 (17), 19-24.

Hu, B. L. (2014). *Business Model: Innovation Mechanism and Performance Impact*. Economic Science Press.

Hu, B. L. (2015). Multidimensional Conception of the Internet of Things Business Model and Its Impact on Enterprise Performance. *Science & Technology Progress and Policy*, (3), 16-22.

Hu, B. L. (2015). Research on the relationship between business model, innovation duality and corporate performance. *Scientific Research Management*, 36 (11), 29-36.

Hu, M. J. (2019). Correlation analysis between policy intervention and innovation performance of listed pharmaceutical companies. *China Pharmaceutical Economics*, 14 (01), 103-108.

Hu, X. F., & Wu, X. M. (2015). Mergers and Acquisitions, Absorptive Capacity and Enterprise Innovation Performance: An Empirical Analysis Based on the Data of Chinese Pharmaceutical Listed Companies. *Social Sciences in Jiangsu*, (2), 25-32.

Huang, A. J., Bai, B., & Zhang, S. S. (2019). Research on the impact of business model on corporate performance from the perspective of value chain: A case study of listed pharmaceutical companies. *Productivity Research*, (4).

Huang, S. F. (2013). Research on the Factors Affecting the Performance of Biomedical Innovation in China: A Scientific Innovation Perspective. *Science of Science and Technology Management*, (06), 10-15.

Huang, X.S. (2015). Research on the interaction between government subsidies, R & D investment and innovation performance of pharmaceutical manufacturing enterprises. Doctoral dissertation.

Huabin, Y., Daming, Y., & University, C. S. (2014). An empirical study on the impact of knowledge conflict of r&d team on radical innovation performance of enterprises. *Chinese Journal of Management*.

Islankina, E. (2015). Internationalization of regional clusters: theoretical and empirical issues. *SSRN Electronic Journal*.

Jiang, C. (2018). Research on the relationship between business model and entrepreneurial performance of startups. Doctoral dissertation.

Jiang, J. (2015). The impact of business model innovation on corporate performance: the moderating effect of life cycle and relationship embedding. Doctoral dissertation.

Jiang, J. (2018). Business Model Innovation and Performance: Adjustment of Life Cycle and Relationship Embeddedness. *Shopping Mall Modernization*, 883 (22), 9-11.

Jiang, W. P., Ji, R. W., & Huang, W. L. (2016). Network embedded perspective explores the construction of a dynamic model of the impact of technological innovation alliances on the technological innovation performance of pharmaceutical companies. *Chinese Journal of New Drugs*, (20), 2294-2300.

Jiang, Y., & Che, B. (2017). The impact of value creation on the performance of marine fishery enterprises: based on the perspective of business models. *Ocean Development and Management*, (5).

Jian-Li, H., & Bang-Tao, W. U. (2014). An empirical study on profit model affecting business performance of scenic spots listed enterprises in china. *Journal of Southwest University for Nationalities (Natural Science Edition)*.

Jing, H., & Zhang, D. X. (2013). Review of research on business models and corporate performance for ecological innovation. *China Science and Technology Forum*, 1 (9), 76-82.

Kelchtermans, Stijn, Leten, BartBelderbos, & René. (2010). *The impact of internal and external basic research on the technological performance of pharmaceutical firms*. Open Access Publications from Katholieke Universiteit Leuven.

Lai, J. M. (2013). Research on Innovation Performance of Zhejiang Pharmaceutical Enterprises Based on Consumer Behavior. *National Circulation Economy*, (9), 11-12.

Lars Göran Wallgren, & Hanse, J. J. (2012). A two-wave study of the impact of job characteristics and motivators on perceived stress among information technology (it) consultants. *International Journal of Technology & Human Interaction*, 8(4), 75-91.

Li, B., & Sun, L. H. (2017). Impact of Environmental Regulations on Industrial Performance: An Empirical Analysis Based on the Pharmaceutical Industry. *Chinese Journal of Pharmaceutical Industry*, (11), 139-143.

Li, H. (2015). Research on the impact of corporate competition and cooperation on performance under the O2O business model. Doctoral dissertation.

Li, H. B., Duan, S. S., & Zhang, Y. M. (2014). Research on business model innovation of Chinese pharmaceutical distribution companies: "gene improvement", system restructuring and strategic choice. *China Science and Technology Forum*, (9), 69-74.

Li, L. (2014). Research on the Impact of Market Orientation and Technology Orientation on Enterprise Performance. Doctoral dissertation, Hunan University.

Li, N., & Liu, J. Z. (2016). Impact of business models of companies listed on the GEM of the new materials industry on corporate performance. *China Market*, (42), 68-71.

Li, Q. (2014). Research on the Impact of R & D Investment and Patent Rights on Corporate Performance of Listed Biopharmaceutical Companies. Doctoral dissertation.

Li, W. (2016). Research on the relationship between business model innovation and operating performance of manufacturing enterprises: based on the perspective of dual capabilities. *Science and Technology Progress and Countermeasures*, (5).

Li, W. W. (2017). Research on the Impact of Business Models on the Performance of Traditional Enterprises - Taking Retail Enterprises in Shanghai and Shenzhen as Examples. *Economy and Management*, (3).

- Li, W. X., & Zhou, A. M. (2012). Comprehensive analysis of business model, operation effect and corporate performance of listed architectural decoration companies. *Architecture*, (19), 25-27.
- Li, W., & Ding, C. (2016). Entrepreneurship, business model innovation and business performance. *China Science and Technology Forum*, (7), 124-129.
- Li, W., Dai, Z.H., & Ding, C. (2018). Research on the Mechanism of Entrepreneur Social Capital Affecting Operating Performance - A Perspective of Business Model Innovation. *East China Economic Management*.
- Li, Y. (2014). Business model innovation of social entrepreneurship firm: A case study of TerraCycle. International Conference on Management Science & Engineering. IEEE.
- Li, Y. (2017). The Impact of Equity Incentives on the Performance of Listed Companies in China's Pharmaceutical Industry. *Times Finance*, (20), 152-153.
- Li, Y. F., Zhang, X. L., & Zhao, Y. (2017). Business model quality and high market performance. *Scientific Research Management*, (9).
- Li, Y. W., Wang, X., & Sun, L. Y. (2013). Impact of business model design of technology startups on corporate performance. *Market Weekly (Theoretical Research)*, (08), 13-16.
- Li, Y., Holgado, M., & Evans, S. (2016). Business model innovation in state-owned and private-owned enterprises in China. Ifip International Conference on Advances in Production Management Systems. *Springer, Cham*.
- Li, Y., Tao, Q. Y., & Sun, S. Q. (2018). Research on the Impact of Business Model Design on Organizational Performance of Startups - Taking Institutional Environment as a Moderator. *Value Engineering*, 37 (36), 123-128.
- Li, Z. X., & Wu, C. J. (2018). The Impact of Business Models on Equity Crowdfunding Performance: An Empirical Study Based on Startup Multilateral Platform Enterprises. *Business Economy*, (1), 117-124.
- Lichtenberg, F., & Laires, P. (2015). The impact of pharmaceutical innovation on longevity in portugal, 2002–2010. *Value in Health*, 18(7), A536-A537.
- Lin, L. (2011). The impact of service innovation on business performance: evidence from firm-level data in chinese tourism sector.
- Lisha, Z., & Hongjie, L. (2016). Business model innovation of logistics enterprise based on the pattern of banking business. International Conference on Logistics. IEEE.

Liu, G., Liu, J., & Cheng, X. R. (2017). Impact of business model innovation timing and intensity on corporate performance. *Journal of Beijing Jiaotong University (Social Science Edition)*, 16 (02), 66-75.

Liu, G., Wang, D., & Li, J. (2017). Heterogeneity of executive team, business model innovation and corporate performance. *Economic and Management Research*, (4).

Liu, M., & Yao, M. Q. (2018). Business Model, Technology Innovation, and Manufacturing Performance: The Moderating Role of Product Market Competition. *Friends of Accounting*, No.587 (11), 81-86.

Liu, P., & Mao, N. (2018). Research on the impact of technological innovation investment in the pharmaceutical industry on current and long-term performance. *Science and Technology Management*, 20 (06), 32-36.

Liu, W. X. (2013). Empirical research on the impact of business models on corporate performance. Doctoral dissertation, Dalian University of Technology.

Liu, Z. Y. (2016). The transmission mechanism of business model influencing corporate financial performance: an explanation framework based on stakeholder theory. *New Accounting*, (2).

Liu, Z. Y., Wang, X., Qiao, H., & Wang, S. Y. (2019). Exploring the impact of business models on corporate performance-based on data from new energy listed companies. *Management Review*, (7), 264-273.

Lou, F. H. (2017). Research on the Relationship between Business Model and Enterprise Performance from the Perspective of Value Network: An Empirical Study of China's GEM Manufacturing. Doctoral dissertation.

Luo, XW, Xiang, GP, Ning, P., & Cheng, C. (2017). How does business model innovation affect the performance of new ventures? —— The role of legitimacy and policy orientation. *Science Research*, (07), 115 -126.

Lv, X., & Liu, X. (2012). Research on business model innovation of the traditional large-scale retail enterprises' transition to the E-commerce. Management of Technology (ISMOT), 2012 International Symposium on. IEEE.

Ma, R. F. (2009). Research on the impact mechanism of cross-border search on corporate performance. Doctoral dissertation, Zhejiang University.

Madian, A. C. (2015). Understanding the implications of business model innovation in small and medium enterprises: measurement development and face validation.

Majumdar, S. K. (2011). Scalability versus flexibility: firm size and r&d in indian industry. *Journal of Technology Transfer*, 36(1), 101-116.

Meng, B. (2014). Research on the business model of Chinese pharmaceutical companies. Doctoral dissertation, Beijing University of Technology.

Meng, B. (2018). Research on the business model of Chinese pharmaceutical companies. Doctoral dissertation, Beijing University of Technology.

Mir, M., Martí Casadesús, & Petnji, L. H. (2016). The impact of standardized innovation management systems on innovation capability and business performance: an empirical study. *Journal of Engineering and Technology Management*, 41, 26-44.

Nair, S. R., Demirbag, M., & Mellahi, K. (2015). Reverse knowledge transfer from overseas acquisitions: a survey of indian mnes. *Management International Review*, 55(2), 277-301.

NAJMAEI, & ARASH. (2016). Revisiting the modularity-performance nexus: business model innovation as a missing mechanism. *International Journal of Innovation Management*, 1650065.

Nie, Li., & Wu, H. (2016). Research on the Impact of Capital Structure and Equity Structure of Pharmaceutical Listed Companies on Operating Performance. *Technology and Innovation Management*, 37 (5), 558-561.

-None. (2004). Clear channel rides on the crest of the airwaves. *Strategic Direction*, 20(10), 21-23.

O'Connor, N. G., Johnny Deng, F., & Tan, J. (2011). The impact of political constraints and formal incentive systems on the performance of chinese state-owned enterprises. *Pacific Accounting Review*, 23(1), 6-33.

OCDE. (2008). *The impact of pharmaceutical pricing policies on pharmaceutical innovation*. SourceOECD Industry.

Olofsson, S., Hoveskog, M., & Halila, F. (2018). Journey and impact of business model innovation: the case of a social enterprise in the scandinavian electricity retail market. *Journal of Cleaner Production*, 175, 70-81.

Oura, M. M., Zilber, S. N., & Lopes, E. L. (2015). Innovation capacity, international experience and export performance of smes in brazil. *International Business Review*, S0969593115300445.

Pang, C. W., Li, H., & Duan, G. (2015). Integration Capability and Enterprise Performance: The Mediating Role of Business Model Innovation. *Management Science*, (5), 31-41.

Pang, X. Q. (2016). Antecedents and Performance of Business Model Innovation: A Management Decision Perspective. Doctoral dissertation.

Parayil, G. (2005). From \"silicon island\" to \"biopolis of asia\": innovation policy and shifting competitive strategy in singapore. *California Management Review*, 47(2), 50-73.

Polychroniou, P., Trivellas, P., Dahlgaard-Park, S. M., & Dahlgaard-Park, S. M. (2018). The impact of strong and balanced organizational cultures on firm performance: assessing moderated effects. *International Journal of Quality and Service Sciences*, 00-00.

Post, J. E., & Sachs, P. S. (2002). Managing the extended enterprise: the new stakeholder view. *California Management Review*, 45(1), 6-28.

Pradhan, J. P. (2003). Liberalization, firm size and r&d performance: a firm level study of indian pharmaceutical industry. *MPRA Paper*.

Prange, C., & Pinho, José Carlos. (2017). How personal and organizational drivers' impact on sme international performance: the mediating role of organizational innovation. *International Business Review*, 26.

Qi, X., & Liu, J. S. (2018). Research on the Impact Mechanism of Corporate Relationship Networks on Brand Performance. *Corporate Economy*.

Qu, Q. H. (2013). *Research on the matching relationship between self-efficacy, resources, opportunities and business models of college entrepreneurs*. China Economic Publishing House.

Rao, Y., & Feng, G. Z. (2013). Analysis of factors influencing the performance of pharmaceutical companies. *Modern Business Industry*, (7), 21-21.

Raudla, R., Taro, Külli, Agu, C., & Douglas, J. W. (2016). The impact of performance audit on public sector organizations: the case of estonia. *Public Organization Review*, 16(2), 217-233.

Rayna, T., & Striukova, L. (2014). *The Impact of 3D Printing Technologies on Business Model Innovation*. *Digital Enterprise Design & Management*. Springer International Publishing.

Rodrigues Junior, M. M., Hein, N., Wilhelm, V. E., & Kroenke, A. (2015). Impact of convergence to ifrs on the economic and financial performance of construction and transportation enterprises: a study conducted through data envelopment analysis. *Applied Mathematical Sciences*, 9, 4499-4521.

Rong, S. H., & Feng, Q. L. (2013). Research on Enterprise Business Model and Its Financial Performance: Taking Starbucks and 85 Degree C as Examples. *Finance and Accounting (Finance Edition)*, (5).

- Rothaermel, F. T., & Hill, C. W. L. (2005). Technological discontinuities and complementary assets: a longitudinal study of industry and firm performance. *Organization Science*, 16(1), 52-70.
- Rubera, G., & Kirca, A. H. (2012). Firm innovativeness and its performance outcomes: a meta-analytic review and theoretical integration. *Journal of Marketing*, 76(3), 130-147.
- Sanaullah K. R., Grigor, V., Win, A., & Boland, M. (2014). Differentiating aspects of product innovation processes in the food industry. *British Food Journal*, 116(8), 1346-1368.
- Schrauder, S., Kock, A., Baccarella, C. V., & Voigt, K. I. (2017). Taking care of business models: the impact of business model evaluation on front-end success. *Journal of Product Innovation Management*.
- Selby, J. W. (2010). A quantitative study describing the impact of innovation-related investment and management performance on corporate financial returns. Dissertations & Theses - Gradworks.
- Shah, A. (2018). Business model innovation and smes performance — does competitive advantage mediate? *International Journal of Innovation Management*, 22(7), 1850057.
- Shao, J. P., & Qu, G. (2018). Research on the Relationship between Business Model and Enterprise Performance - Taking listed automobile manufacturing enterprises as an example. *Business Accounting*, No.636 (12), 85-90.
- Shengxiao, L. I. (2013). Impact of external innovation search strategies on new enterprises' innovation performance. *Chinese Journal of Management*.
- Song, H., Wang, L., & Wang, X. L. (2008). An empirical study on the impact of Chinese pharmaceutical distribution informatization on performance. *Prediction*, (5).
- Song, M. L., Cheng, X. H., & Fei, R. (2015). Research on the relationship between entrepreneurial orientation, business model innovation and corporate performance. *Higher Education Journal*, (09), 17-19.
- Stern, S. (2004). Do scientists pay to be scientists? *Management Science*, 50(6), 835-853.
- Su, A. Y. (2015). Research on the relationship between business model innovation and corporate performance. *Enterprise Reform and Management*, (24).
- Sun, P. (2012). Talking about the Construction of Performance Management System of Pharmaceutical Enterprises after Reorganization. *Journal of Heze University*, (04), 58-60.

Sun, T. J. (2016). R & D talent incentives in private pharmaceutical companies and its mechanism of innovation performance. Doctoral dissertation.

Sun, Y. N. (2012). Research on the impact of management stress on the performance of pharmaceutical manufacturing enterprises. Doctoral dissertation, Northeast Agricultural University.

Sun, Z. P., & Shen, J. L. (2007). Analysis of market performance and profitability of pharmaceutical companies. *China Medical Herald*, (23), 173-175.

Sun, Z.M. (2001). Research on the Growth Business Model and Performance of Small Enterprises in Zhejiang. Doctoral dissertation, Zhejiang University of Technology.

Talke, K. (2007). *Corporate mindset of innovating firms: Influences on new product performance*. Elsevier Science Publishers B. V.

Tan, J. B, & Zhang, W. (2017). The Impact of Business Model Innovation on Corporate Financial Performance - Taking Zhangjiajie Tourism Group Co., Ltd. as an Example. *Journal of Shanxi Finance and Taxation College*, v.19; No.112 (05), 39-43.

Tang, X. Y. (2011). Research on the relationship between service innovation capability and performance of construction enterprises. Doctoral dissertation.

Tao, Z. Y. (2014). An empirical study on the relationship between innovation ability and performance of listed pharmaceutical manufacturing companies. Doctoral dissertation, Chongqing Technology and Business University.

Torres, I. T., Gutierrez, L., & Dominguez, M. C. H. (2010). Innovation and operative real options as ways to affect organisational learning. *International Journal of Technology Management*, 49(4), 421-438.

Visnjic, I., & Van Looy, B. (2012). *Servitization: disentangling the impact of service business model innovation on the performance of manufacturing firms*. Social Science Electronic Publishing, 31(4).

Visnjic, I., Wiengarten, F., & Neely, A. (2016). Only the brave: product innovation, service business model innovation, and their impact on performance. *Journal of Product Innovation Management*, 33(1).

Wang, C. B. (2016). Research on the relationship between entrepreneurial orientation, business model and corporate performance. Doctoral dissertation.

Wang, C. B., & Du, D. (2015). Entrepreneurial Orientation, Business Model and Enterprise Performance Research Framework Design. *Economic Research Herald*, (20), 18-21.

Wang, H. (2015). Research on the impact of corporate business models on financial performance. *Business Economics Research*, (36), 100-101.

Wang, H. H. (2016). Research on the impact of business models on the performance of textile and apparel companies. Doctoral dissertation.

Wang, H. H., & Shen, D. H. (2015). Research on the impact of business models on the performance of apparel and textile enterprises. *Journal of Guangxi University of Finance and Economics*, v.28; No.142 (4), 92-96.

Wang, K. J., & Liu, Z, C. (2018). Research on the impact of R & D innovation on the performance of China's biomedical listed companies. *Modern Business Industry*.

Wang, L., Ma, S. M, & Li, Y. (2017). Dynamic environment and logistics enterprise performance analysis based on business model innovation. *Business Research*, (3).

Wang, W., Zhang, SL, Wang, YW, & Li, YR (2017). Relationship building behavior, business model innovation and new venture performance: An empirical study from the perspective of innovation and entrepreneurship. *East China Economic Management*, (10).

Wang, X. (2015). Analysis of business model innovation performance of service enterprises from the perspective of industrial integration. *Technoeconomics*.

Wang, X. (2017). Research on the relationship between business model types and corporate performance. *China Management Informatization*, (9).

Wang, X. Q., Zhang, Y. B., & Ye, Y. (2015). A Study on the Moderating Factors of the Impact of Dual Innovation on Enterprise Performance: Based on the Literature Analysis of Meta. *Modern Intelligence*, (06), 109-115.

Wang, X., & Xiao, T. (2015). Analysis on the innovation performance of service business enterprises' business models from the perspective of industrial integration. *Technoeconomics*, (05), 50-59.

Wang, X., Li, D., & Hou, S. X. (2015). Empirical research on the impact of business model structure coupling on corporate performance. *Scientific Research Management*, (07), 99-107.

Wang, X., Li, D., & Zhang, X. L. (2010). Is the business model the driving factor of performance difference among enterprises? Based on the anova analysis of listed companies in nonferrous metals in China. *Social Sciences in Nanjing*, (5).

Wang, X.M. (2013). Research on the impact of business model design on innovation performance of small and micro-tech enterprises. Doctoral dissertation.

Wang, Y. M., & Fu, X. Z. (2016). Empirical analysis of business model innovation and corporate performance in the mobile phone industry. *Cooperative Economy and Science and Technology*, No.539 (12), 135-137.

Wang, Y. M., & Fu, X. Z. (2016). Empirical analysis of business model innovation and corporate performance in the mobile phone industry. *Cooperative Economy and Technology*, (12), 134-136.

Wehner, M. C., Schwens, C., & Kabst, Rüdiger. (2015). Individual-level experience and organizational-level absorptive capacity: the special case of international new ventures. *Journal of Business Economics*, 85(5), 545-568.

Wei, W. (2015). Research on the relationship between business models and corporate performance from the perspective of value creation. Doctoral dissertation, Zhejiang Gongshang University.

Wen, L. (2011). *Research on business model and entrepreneurial performance*. Economic Science Press.

Wen, L. (2018). Research on the relationship between business model and entrepreneurial performance and its influencing factors. Doctoral dissertation, Central South University.

Wen, L., Liu, L. C., & He, S. (2012). Research on the relationship between business models and entrepreneurial performance of start-ups: the application of grounded theoretical methods. *Social Sciences in Jiangxi*, (1), 207-210.

Wijewardena, H., Zoysa, A. D., Fonseka, T., & Perera, B. (2004). The impact of planning and control sophistication on performance of small and medium-sized enterprises: evidence from sri lanka. *Journal of Small Business Management*, 42(2), 209-217.

Wnag, X.M. (2017). Research on the impact of business model design of small and micro-tech enterprises on innovation performance. Doctoral dissertation.

Wong, Y. K. (2006). A theoretical model for analysis of software review performance. *Modern Software Review Techniques & Technologies*.

Wu, B. (2017). Research on the mode, mechanism and dynamic evolution characteristics of enterprise R & D outsourcing. Doctoral dissertation, Zhejiang University.

Wu, G. (2014). Business Model, Asset-light and Corporate Performance. *Finance and Accounting (Finance Edition)*, (9).

Wu, G. R., & Jiang, M. W. (2018). Literature review on the relationship between business models and corporate performance. *Special Economic Zone*, (4), 156-158.

Wu, G., & Li, T. D. (2016). The Impact of Business Models on Corporate Performance: An Empirical Analysis Based on the Clothing Industry. *Financial Research*, (2), 33-42.

Wu, J. Z., & Wang, Z. Z. (2019). Research on the relationship between the four dimensions of business models and business performance: based on GEM data. *Journal of Chongqing Technology and Business University: Social Science Edition*, (4), 61-67.

Wu, J., Zhang, JQ, & Liu, H. (2000). Research on the relationship between efficient business model innovation and corporate performance: the moderating role of causal reasoning and effect reasoning. *Technology Economics and Management Research*, (Phase 3), 8 -13.

Wu, J., Zhang, JQ, Liu, H., & Guo, ZS (2016). Novel business model innovation and corporate performance: the moderating effect of effect reasoning and causal reasoning. *Science of Science and Technology Management*, v. 37; No. 415 (04), 61-71.

Xia, QH, Jia, KT, & Feng, Y. (2016). How Entrepreneurial Opportunities Affect Enterprise Performance: Mediating and Moderating Roles Based on Business Model Innovation and Environmental Uncertainty. *Learning and Practice*, (11), 40-50.

Xiang, G. P., & Zhou, P. J. (2013). The Impact of Corporate Business Models on Performance: An Analysis from the Perspective of Customer Value and Empirical Study of Listed Companies in China's Retail Industry. *Journal of Guangdong University of Finance and Economics*, 28 (1), 25-33.

Xiao, S., & Chen, X. F. (2017). The Impact of Business Model Innovation on Enterprise Performance: Based on the Case Study of Semir Enterprise. *Science & Technology Economics*, (1), 199.

Xiao, T. (2019). Analysis of Enterprise Performance Management System from the Perspective of Business Model. *China Market*, (25).

Xiao, T., Liu, H., & Ye, F. (2013). An empirical study on the relationship between the heterogeneity of the executive team and the innovation performance of the business model: taking listed companies in the service industry as an example. *China Soft Science*, (08), 130-140.

Xing, Y. T. (2014). Evaluation of corporate social responsibility in pharmaceutical manufacturing and its impact on corporate performance. Doctoral dissertation, Chongqing Technology and Business University.

Xiong, T. (2013). The impact of acquisitions on company performance: evidence from data of u.k. pharmaceutical firms.

Xu, H. Z. (2014). Research on the business model and performance of traditional enterprises in the context of e-commerce: Taking Chinese textile and apparel listed companies as an example. *Journal of Shantou University: Humanities and Social Sciences (Issue 4)*, 48-54.

Xu, H., & Zhao, H. H. (2015). Research on the influence of management incentives of pharmaceutical manufacturing companies on corporate performance. *Biotechnology World*, (05), 194.

Xu, Q. (2015). A Study on the Impact of Service-oriented Business Model Innovation on Performance of Chinese Manufacturing Enterprises: Taking GEM Listed Companies as an Example. Doctoral dissertation.

Xu, S. Y. (2014). The impact of service innovation capabilities on corporate performance: the moderating role of novelty design of business models. Doctoral dissertation, Zhejiang University.

Xu, X. Q. (2011). Research on the Impact of Debt Financing on Corporate Performance—Taking Chinese Pharmaceutical Listed Companies as an Example. Liaoning Economic Vocational and Technical College. *Journal of Liaoning Economic Management Cadre College*, (4), 15-16.

Yan, J., Liu, Z. Y., & Zheng, X. F. (2016). Transformative leadership, business model innovation and corporate performance under the influence of environmental dynamics. *Journal of Management*, 13 (8), 1208-1214.

Yang, X., Liu, C., & He, YC (2019). Research on the Effect Mechanism of Business Model Innovation on Enterprise Performance from the Perspective of Dynamic Capabilities: Taking Manufacturing Listed Companies as an Example. *Industrial Technology & Economy*, 38 (02), 122-130.

Yang, Z. B. (2018). Service-oriented Performance of Manufacturing Enterprises - A Study on the Mediating Role of Business Models and Cultural Barriers. *Science & Technology Progress and Policy*, v.35; No.438 (02), 109-115.

Yang, Z. P., & Zou, Z. F. (2013). Research on the Impact of Product Diversity and Regional Diversity on Corporate Performance—Based on the Empirical Study of Chinese Pharmaceutical and Biological Listed Companies. *China Business*, (20), 51-53.

Ye, H. Y., & Yang, Y. Q. (2016). Empirical Research on the Impact of Internal Resource Allocation Efficiency of Pharmaceutical Manufacturing Listed Companies on Enterprise Performance. *Economic and Management Review*, (5).

Yi, J. B., Xie, D. M., & Gao, J. W. (2015). Empirical research on the influencing factors of business model innovation in high-tech enterprises: based on the perspective of knowledge. *Scientific Research Management*, 36 (2), 50-59.

Yin, X. T. (2019). Types of Business Model Innovation and Enterprise Performance Structure. *Management Observation*, 715 (08), 11-12.

Yong, D. U., Huan, Z., & Jian-Ying, C. (2017). The impact of financialization on future development of real enterprises' core business: promotion or inhibition. *China Industrial Economics*.

Yu, M. S. (2013). Comparative research on financial performance and financial policies of Vanke and Shimao. Doctoral dissertation.

Yuan, Y., Ran, Y., Zhang, H., & Yang, W. (2018). A study on the impact of the manufacturing enterprises' competitive strategies on their performance - based on the intermediary role of technological innovation.

Zeng, J. J., & Liu, D. J. (2017). Network embeddedness, network structure and corporate innovation performance of biomedical industry clusters. *China Science and Technology Forum*, (5).

Zeng, J., Phan, C. A., & Matsui, Y. (2015). The impact of hard and soft quality management on quality and innovation performance. *International Journal of Production Economics*, 162, 216-226.

Zhan, Y., Chen, Y., & Zhai, R. (2017). The Impact of International Inter-City Investment on Enterprises Performance: Pluralistic Interpretation of Geographical Death. International Conference on Algorithms and Architectures for Parallel Processing. *Springer, Cham*.

Zhang, J. (2017). Research on the relationship between service-oriented business models and performance of manufacturing enterprises. Doctoral dissertation.

Zhang, J. S. (2018). Research on the impact of business models on corporate performance from a value chain perspective. Doctoral dissertation.

Zhang, J., & Duan, Y. (2010). Empirical study on the impact of market orientation and innovation orientation on new product performance of chinese manufacturers. *Nankai Business Review International*, 1(2), 214-231.

Zhang, L. (2015). The transmission mechanism of business model affecting corporate financial performance: An explanation framework based on stakeholder theory. *China Economics and Trade (17th Issue)*, 174-175.

Zhang, L., & Bian, J. H. (2015). Research on the Impact of Social Responsibility on Performance of Chinese Pharmaceutical Enterprises. *Reform and Opening*, (07), 86-89.

Zhang, M. (2016). Research on the impact of mergers and acquisitions of pharmaceutical companies on technological innovation performance. Doctoral dissertation.

Zhang, S. C. (2018). Research on the impact of debt financing structure of pharmaceutical listed companies on corporate performance. Doctoral dissertation, Jiangsu University.

Zhang, X. L., Dai, Q. L., & Ge, L. F. (2017). Basic characteristics, heterogeneous characteristics and business performance of business models: based on the test of dual intermediation model. *East China Economic Management*, (8).

Zhang, X. L., Pu, Y. Q., & Ge, L. F. (2017). Cooperation and Innovation: A Study on the Relationship between the Typical Characteristics of SME Business Models and Their Performance. *Science and Technology Management Research*, (17).

Zhang, X. L., Zhao, Y., & Ge, L. F. (2015). The intermediary impact of typical characteristics of business models on business performance: based on the perspective of key resources of enterprises. *Technoeconomics*, 34 (2), 1-12.

Zhang, XL, Li, D., & Zhao, Y. (2012). Research on the impact of matching between business model components on corporate performance: Taking GEM and SMEs as examples. *CUHK Management Research*, 7 (2), 140-163.

Zhang, XL, Zhao, Y., & Li, D. (2011). Research on the impact of matching between the basic components of business models on corporate performance: Taking GEM and SMEs as examples. The 6th (2011) China Management School Annual Meeting-Organization and Strategy Session.

Zhang, Y. (2011). Financial Performance Effects of Jewellery Business Models: A Comparison of "Chao Hongji" and "Lao Fengxiang". Doctoral dissertation, Xiamen University.

Zhang, Y. (2019). The impact of drug supervision on the performance of Chinese pharmaceutical companies and its mechanism. *Chinese Pharmaceutical Journal*, 54 (06), 83-87.

Zhang, Y., Wang, G., & Liu, Y. W. (2017). Research on the interaction between social responsibility and financial performance of pharmaceutical companies. *Financial Supervision*, (8), 105-109.

Zhang, Y., Wei, J., & Zhu, Z. J. (2019). Strategic orientation and product innovation performance of small and medium-sized pharmaceutical companies: a multi-case study. *China Science and Technology Forum*, (7).

Zhang, ZY, Jin, J., Chen, J, Y., & Guo, M. (2015). Research on the impact mechanism of business model design on the performance of new ventures. *Journal of Xidian University (Social Science Edition)*, 25 (6), 23-32.

Zhao, H. F. (2016). Research on the impact of pharmaceutical corporate social responsibility on financial performance. Doctoral dissertation.

Zhao, K., & Mao, N. Y. (2017). Exploration of business model innovation in China's pharmaceutical distribution industry: based on the perspective of supply chain management. *Business Economics Research*, (12).

Zhao, M. H. (2019). The Impact of Customer Value Proposition on the Innovation Performance of Business Models. *Business Economics Research*, 765 (02), 95-98.

Zhao, Y. L. (2009). Research on the relationship between intellectual property rights and business performance of pharmaceutical companies. *Scientific Research Management*, V30 (4), 175-183.

Zhao, Y., Zhang, XL, & Ge, LF (2019). Multiple intermediary effects of business model replication characteristics on business performance: based on the perspective of key resources and TMT dynamic management capabilities. The 9th (2014) Annual Conference of China Management -Organization and Strategy Session.

Zheng, Y. Y. (2018). Analysis of the impact of corporate scientific capabilities on corporate innovation performance. Doctoral dissertation, Zhejiang University.

Zhi-Hua, Q., & Rui, L. (2013). An empirical study on the impact of R&D investment and employee involvement on innovation commercialization - Evidence from IT firms in China. International Conference on Management Science & Engineering. IEEE.

Zhou, L. Y. (2017). Research on the Performance Impact of Information Technology Service Business Models. Doctoral dissertation.

Zhou, P. F. (2015). Research on the Impact Mechanism of Business Model Reproducibility on Enterprise Performance. Doctoral dissertation.

Zhou, P. J. (2013). The impact of business models on business performance: an analysis of customer value and empirical evidence from listed companies in the retail industry. Doctoral dissertation, Zhejiang Gongshang University.

Zhou, S. H. (2016). Research on Hengrui Pharmaceutical's business model innovation. Doctoral dissertation.

Zhou, Y., Wang, SY, He, J., Mou, XD, & Zeng, X. (2018). The impact mechanism and empirical research of business model on corporate performance: based on the perspective of business ecosystem. *The practice of mathematics and Recognition*, 48 (12).

Zhu, K. X. (2015). Research on the relationship between dynamic capabilities and business model innovation. *Business*, (05), 15.

Zhu, Q. (2018). Asset-light Business Model and Enterprise Performance: Based on Strategic Emerging Industry Listed Companies. *Green Finance and Accounting*, No.370 (04), 31-38.

Zhu, S. Z, & Du, L. N. (2017). Research on the relationship between innovation input, innovation output and enterprise innovation performance based on cdm model: A case study of a listed company in the pharmaceutical manufacturing industry. *Industrial Technology & Economy*, (07), 138-144.