The Effect of Supply Chain Dynamic Capability on Competitiveness and Business Efficiency of Vietnamese Wood Enterprises*

Binh Thi NGUYEN[1], Anh Thi Van MAI[2]

Abstract

Purpose: Developing and nurturing supply chain dynamic capability is one of the leading solutions to create competitive advantages, maintain growth and sustainable development for businesses. The study was conducted to experimentally confirm the impact of supply chain dynamic capability on competitiveness and business efficiency for Vietnamese wood enterprises. **Research design, data and methodology:** The study surveyed 236 managers of Vietnamese wood manufacturing and distribution enterprises. The authors applied the structural equation modeling (SEM) to analyze the relationship between the dynamic capability of the supply chain and the competitiveness, business efficiency of enterprises to achieve those goals. **Results:** The results show that businesses owning supply chain dynamic capability will have better competitiveness and business efficiency. Especially, in the context of Vietnamese wood sector, the larger the scale of business, the more profound the impact of supply chain dynamic capability on competitiveness and business efficiency. **Conclusions:** Focusing on developing supply chain dynamics would be a promising solution to improve the competitiveness of Vietnam's wood enterprises in the global market.

Keywords: Wood Products; Distribution Channel, Supply Chain Dynamic Capability, Competitiveness, Business Efficiency.

JEL Classification Code: L11, D24, O31

1. Introduction

Currently, in the integrated economy, with the development of science and technology, tangible resources are becoming familiar to all businesses. They are easily detected and evaluated, so they are uncomplicated to imitate, which leads to a diminished value due to their popularity and recognizability. In fact, in enterprises, there are always intangible resources (knowledge, art of leadership). They are considered one of the hidden values that create the dynamic capability of enterprises.

Research on dynamic capability and its role in a firm's competitiveness and business efficiency has been receiving the attention of many scholars around the world. The significance of dynamic capabilities is often expressed in aspects such as (i) creating competitive advantages for enterprises (Teece, Pisano, & Shuen, 1997; Eisenhardt & Martin, 2000; Ambrosini & Bowman, 2009; Masteika & Cepinskis, 2015; Sijabat, Nimran, Utami, & Prasetya, 2020; Prabowo, Sriwidadi, & Ikhsan, 2021); (ii) help businesses solve problems caused by environmental changes (Vu, 2020); (iii) Bringing business efficiency to enterprises (Eisenhardt & Martin, 2000; Vu, 2020).

The industry competitiveness of enterprises in developing

1 First and Corresponding Author, Lecturer, School of Economics and International Business, Foreign Trade University, Hanoi, Vietnam. Email: ntbinh@ftu.edu.vn

2 Second Author, Sales Department, Airseaglobal Group Joint Stock Company, Hanoi, Vietnam. Email: vananh301199@gmail.com

countries in general and in Vietnam, in particular, is still low, far behind developed countries due to the low level of technology, machinery, skills. The ability to participate in the regional and global value chains of these countries is still limited. Specifically, they mainly engaged in processing and assembly. At the same time, they face many difficulties in development as well as supply chain management. Although Vietnam's domestic market has more than 90 million people with great potential, most Vietnamese wood enterprises have not yet built a distribution channel in the domestic market. Wood products in Vietnam are mainly supplied by craft villages with improperly-built distribution channels. To enhance value, create a competitive advantage, and quickly react to unexpected changes (in the economic, social, political environment), businesses need to develop intangible supply chain resources. These resources are difficult to detect and capture. That is the dynamic capability of the supply chain.

The literature review shows that dynamic capability plays an essential part in improving the enterprises' competitiveness and business efficiency. Indeed, the study of Hong, Zhang, and Ding (2017) showed that the practice of supply chain dynamic capability has a considerable positive impact on all three aspects (economic, environmental, and social) in Chinese manufacturing enterprises. Supply chain dynamic capability can positively affect environmental performance, but it does not influence economic and social efficiency. The study by Liao, Hu, and Ding (2017), which examined whether Taiwan's network communications industry could enhance its competitive advantage through improved its supply chain dynamic capability or not, partly demonstrated this statement. The study examined the relationships of the innovation of supply chain collaboration value, supply chain capability, and competitive advantage. The results show that renovating collaboration values of the supply chain is likely to have a positive and sustainable impact on competitive advantage and business efficiency. Besides, research by Dang and Le (2018), conducted in Vietnam, shares many similarities with the research results of Liao et al. (2017).

In Vietnam, wood has been a commodity with high export value in recent years. According to the General Statistics Office (2021), Vietnam's export turnover of wood and wood products in 2020 reached 12,372 million US dollars, 1.8 times higher than the wood export turnover in 2015. Up to now, Vietnam wood products have been present in over 140 countries and territories. Vietnam continues to rank the first in ASEAN, the second in Asia, and the fifth in the world in terms of export value of timber and forest products (Report on Vietnam's import and export of wood and wood products in 2020: actual state, trends, and risks warning). Meanwhile, this industry still has a lot of market space, which requires a focus on breakthrough solutions to step by step seize opportunities and promote advantages to accelerate faster growth in the upcoming years. However, according to the Ministry of Agriculture and Rural Development, in addition to the severe impacts of the COVID-19 pandemic, Vietnam's wood industry would face many challenges in the fierce competition of foreign firms in the flat economy. In particular, the competitiveness of Vietnamese wood processing and exporting enterprises is mainly unsound and unsustainable (loose supply chain, scattered investment, small scale, using borrowed capital, less likely to invest in advanced distribution channel and processes). Therefore, businesses should pay more attention to developing dynamic supply chain capability to increase competitive advantage and business efficiency.

In general, there have been several studies related to assessing the impact of supply chain dynamic capability on the competitiveness and business efficiency of enterprises worldwide. However, in Vietnam, this field of research remains quite limited. In particular, to the authors' knowledge, there have been no studies approaching to assess the impact of supply chain dynamic capability on the competitiveness and business efficiency of wood enterprises - one of Vietnam's chief and developing industries. Therefore, this study is carried out to empirically verify the impact of supply chain dynamic capability on competitiveness and business efficiency for timber enterprises, thereby proposing solutions for sustainable development of Vietnam's wood industry in the coming time.

2. Literature Review

2.1. The supply chain dynamic capability

In recent years, supply chain dynamic capability has been an emerging and popular concept, with no clear definition and elusive nature. In general, many studies have suggested that supply chain dynamic capability is the ability of the supply chain to adapt efficiently to changes in the environment.

Masteika and Cepinskis (2015) argued that the dynamic capabilities of the supply chain make organizations more flexible. Therefore, they can easily and quickly adapt to market trends and effectively deal with market fluctuations, which ultimately allows the company to gain a sustainable competitive advantage in the industry.

In addition to the overview studies on the concept and role of the dynamic capability of the supply chain, many studies in this field have focused on clarifying the criteria reflecting the supply chain dynamic capability. The authors have summarized some typical studies on this topic as follows:

Table 1: Criteria reflecting supply chain dynamic capability

Source	Objectives of the study	Criteria reflecting the dynamic capability of the supply chain and businesses
Teece (2007)	This study aims to determine the nature and micro-base of the capabilities required to sustain outstanding corporate performance in an open economy with rapid innovation and globally dispersed sources of invention, innovation, and production capacity.	– The ability to identify and shape opportunities and threats in the business environment; in particular, it emphasizes the opportunities and challenges posed in distribution and product innovation. – The ability to seize opportunities through investment in the development of new products, processes, or services; – Risk control and refactoring.
Wang & Ahmed (2007)	The study clarifies the concept of dynamic capabilities, then identifies three components that reflect collective features of dynamic capabilities among firms.	– Adaptability – Absorption ability – Creativity
Beske (2012); Beske, Land, & Seuring (2014)	Discuss the complementarities of Dynamic Capabilities (DCs) and sustainable supply chain management (SSCM) research; and second, develop a framework that integrates DCs in SSCM practices.	– Ability to re-establish supply chains – Knowledge of the supply chain – Possibility of co-development – Ability to flexible control the supply chain – Develop supply chain partnerships
Hong et al. (2017); Dang & Le (2018)	– Research by Hong et al. (2017) assessed the impact of practicing SSCM on the dynamic capability of the supply chain (SC) and the operational efficiency of Chinese manufacturing enterprises. – The authors studied the impact of supply chain dynamic capability on the competitiveness and business efficiency of Vietnamese enterprises.	– Ability to acquire knowledge – Ability to perceive the market orientation – Creativity – Refactoring ability – Ability to develop relationships with partners.
Aslam & Azhar (2018)	This study positions market sensing, supply chain agility and supply chain adaptability as a coherent cluster of dynamic supply chain capabilities. The purpose of this paper is to understand how dynamic supply chain capabilities interrelate and their effect on supply chain ambidexterity.	– Supply chain agility; – Supply chain adaptability; – The ability to sense and develop following market orientation.

It can be said that the above studies have systematically provided the theoretical foundation of criteria and the ability to measure the dynamic capability of the supply chain on different scales (enterprises and industries). Based on these research results, the authors have summarized and proposed a set of criteria that can be applied to assess dynamic capability in Vietnam's wood industry as follows:

(1) Knowledge of the enterprise's supply chain (Hong et al., 2017)

(2) Flexibility of SC: The flexibility and agility of the supply chain are recognized by the authors as a necessary and fundamental ability to help enterprises in the supply chain survive and develop in a changing environment. (Gligor & Holcomb, 2014; Braunscheidel & Suresh, 2009)

(3) The ability to create and improve SC: the innovation and improvement ability help businesses have advantages in

terms of quality in the market, building a sustainable trust in customers (Hong et al., 2017).

(4) SC is set up to be market-oriented: Day (1992, 1994) argued that companies that engage in a closer study of the market situation (market perception) have a better chance of understanding and acting against market uncertainties and trends. Bharadwaj and Dong (2014) reaffirmed that systematically implementing market sensing activities to synchronize with market changes can facilitate supply chains creating outstanding values. Thereby, it contributes to enhancing the competitive advantage of enterprises.

(5) Developing partnerships within SC (Hong et al., 2017).

(6) The ability to re-establish SC: is the willingness to re-establish links and operational cycles in the supply chain when necessary (Ketchen & Hult, 2007).

2.2. Competitiveness and business efficiency

According to Porter (1998), the competitiveness of enterprises is the ability to maintain and expand market share and achieve high profits. Porter believes that to compete successfully, enterprises must have a competitive advantage, have lower production costs, or be possible to differentiate their products to achieve higher-than-average prices.

Competitiveness is the ability to consume goods and services compared to competitors and the capability of enterprises to "make profits". This concept agrees with the research works of Mehra (1998), Ramasamy (1995), Buckley (1991), Schealbach (1989), Central Institute for Economic Management, National Committee for International Economic Cooperation of Vietnam.

Business efficiency is a measure reflecting the extent to which resources are utilized to achieve defined business objectives. Only business enterprises aim to maximize profits and therefore need to evaluate business efficiency (according to the Business Administration Textbook, published by the National Economics University of Vietnam).

In recent years, researches on competitiveness and indicators of enterprise competitiveness have received the attention of many scholars.

According to research by Hill and Jones (2001), the competitiveness of enterprises is mainly based on efficiency, quality, innovation, and the ability to satisfy customers. These factors have a mutual relationship, reciprocally affect. The positive impact between them can improve quality and can bring higher prices, lower costs, thereby improving the competitiveness of enterprises. Besides, in the production activities of American enterprises, an ambidextrous supply chain strategy coincides with combinative competitive capabilities and business performance (Kristal, Huang, & Roth, 2020). This study also confirms that "the construct of combinative capabilities is a multidimensional, second-order construct reflected by first-order capabilities of quality, delivery speed, process flexibility, and low cost".

In general, the business efficiency of the organization is reflected in two factors: (1) Relationship with customers; (2) Financial efficiency. Effective customer relationship is assessed based on customer satisfaction and loyalty to the business (Trainor, Rapp, Beitelspacher, & Schillewaert, 2011), which greatly depends on the product distribution channel. Financial efficiency is reflected in profits and growth. As profit is the final operation performance of an enterprise, it is only necessary to focus on analyzing profitability when analyzing the business efficiency of enterprises (Josette Peyrard, 2005).

The following indicators reflect the competitiveness and business efficiency of enterprises:

Table 2: Indicators reflect the competitiveness and business efficiency of enterprises

	Indicators	Source
Competitiveness	(1) Price: Price is one of the most significant factors showing the competitiveness of a product. Today, science and technology have developed at a high level, and the product quality is almost the same. As a result, price is one of the most attractive factors.	Hill & Jones (2001); Kristal et al. (2010); Liao et al. (2017).
	(2) Quality: The quality of products/services makes the differences, uniqueness and satisfies customers' needs. Good product or service quality attracts buyers, raising sales volume, increases revenue and profit. In addition, good quality builds up customers' trust in the enterprise.	
	(3) Delivery Dependability: Having a reliable, flexible, and optimized distribution system saves costs for businesses, ensuring delivery at the right time and location for customers. Hence, it makes sure customer satisfaction, contributing to increasing the competitiveness of enterprises.	
	(4) Product Innovation: Enterprises need to quickly innovate and improve, to adapt and respond to market changes. That can help businesses gain advantages in terms of quality in the whole market, which creates a sustainable trust in customers.	
Business efficiency	(1) Evaluate the financial efficiency through 3 basic financial statements of enterprises: income statement, balance sheet, and cash flow statement.	Trainor et al. (2011); Liao et al. (2017)
	(2) Customer satisfaction: Customers' satisfaction with products/ services of enterprises will create customer loyalty to the firm, thereby raising businesses revenue and profits.	

In Vietnam, enterprises in the wood industry create competitive advantages for their businesses based on low cost and focus on improving product design. In particular, Vietnam's competitive advantage is the abundant, cheap, skillful, hardworking, industrious labor sources in all stages of the supply chain (forest planting, exploitation, processing, and transportation). However, as aforementioned, one of the main limitations in Vietnam's wood industry development is that it has not built a professional and methodical distribution channel, even in the domestic market. Besides, science and technology have developed at a high level, the product quality of companies is almost the same. Hence, the price and optimized distribution network become attractive factors. As a result, Vietnamese firms concentrate on optimizing production costs to create a competitive advantage in prices and design a flexible and efficient distribution channel for wood and wood products.

Currently, wood enterprises worldwide and in Vietnam are following the trend of creating and improving products in the design stage. Enterprises focus on developing product designs to create differentiation, uniqueness and attract customers. Consumers tend to be fond of the products designed by firms instead of enterprises passively manufacturing and processing according to available designs, thereby creating an exclusive and leading advantage. Business efficiency is a measure that reflects the extent to which resources are utilized to achieve defined business objectives. Improving the business efficiency of enterprises makes them achieve good results in production and distribution activities, expanding production scale in both width and depth while increasing the ability to access customers. Besides, it helps firms invest in building facilities, procure modern equipment, manufacture products with high quality, low costs, save raw materials, augment product's competitiveness in the market, and most importantly increasing profits. In short, businesses should focus on acquiring financial efficiency and customer contentment to achieve business efficiency.

3. Research Methods and Materials

3.1. Research model and hypothesis

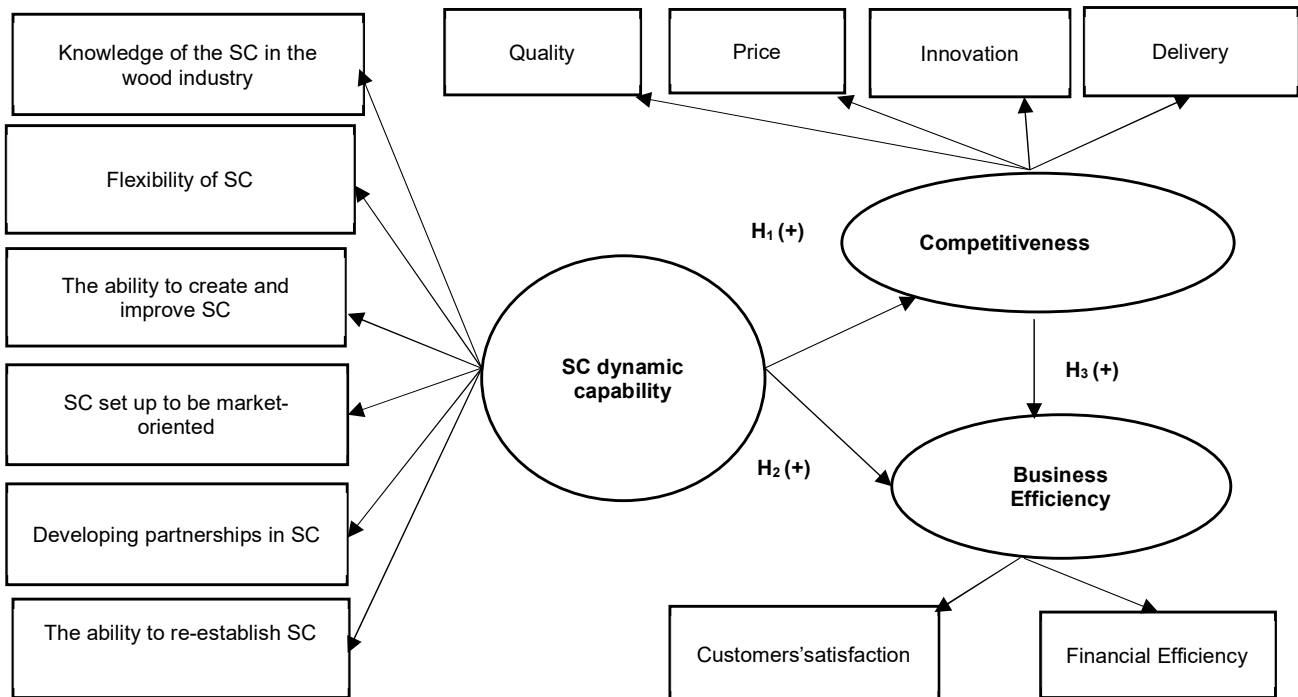From previous studies and theoretical basis, the authors propose the following research models and hypotheses:

Figure 1: The model of research

Research hypotheses:

In general, the dynamic capability helps enterprises achieve competitive advantages and business efficiency (Teece et al., 1997; Eisenhardt & Martin, 2000; Ambrosini & Bowman, 2009). Specifically, the dynamic capabilities of the supply chain make organizations more flexible, so they can easily and quickly adapt to market trends and effectively deal with market fluctuations, ultimately allowing the company to gain a sustainable competitive advantage in the industry (Masteika & Cepinskis, 2015).

H1: The dynamic capability of the supply chain (SC) positively influences the competitiveness of wood enterprises in the North of Vietnam.

H2: The dynamic capability of the supply chain (SC) positively affects the business efficiency of wood enterprises in Northern Vietnam.

Competitive firms will be capable of maintaining, expanding market share, and achieving high profits (Porter, 1998). Accordingly, these companies would meet customer needs in product design, quality, and price better than other businesses. Thereby, they expand market share and form a file of loyal customers, which facilitates the business efficiency of the firm.

H3: Competitiveness has a positive impact on the business efficiency of wood enterprises in the North of Vietnam.

3.2. Research method and Data Collection

This study assesses the influence of supply chain dynamic capability on the competitiveness and business efficiency of wood enterprises in Northern Vietnam by using the following analytical methods. First, testing the reliability of Cronbach's Alpha scale will help check whether the observed variables of the original factor are reliable and great or not. Besides, EFA tests the suitability of the scale and the model. The authors also check the convergence, divergence, reliability, and appropriateness of the model in the CFA test. In addition, the Structural Equation Modelling (SEM) is used to analyze the multidimensional relationship between variables in a model. Finally, multigroup analysis is performed to evaluate the difference of effects in the SEM model between different values of qualitative variables. Data were processed by software including SPSS 22 and AMOS 22.

To collect data for empirical analysis, through previous studies, the authors proposed a research model, then built the scale and survey form. After that, the authors consulted experts and conducted a trial survey with five enterprises to agree on the model, scale, and official survey. After the official survey form was available, the authors conducted an online survey, interviewed wood manufacturing and distribution enterprises from May to June 2021, then collected 236 questionnaires from management and specialized departments of the enterprises. Quantitative variables were measured on a 5-point Likert scale.

The study uses 5 qualitative variables to determine the survey sample's characteristics, including the type of business, operating time, scale, source of raw materials/ semi-finished products, distribution and consumption market of wood and wood products. Through 236 survey questionnaires obtained, the chief type of business venture is private enterprises (accounting for 93.22%). Most of the enterprises have been operating for more than 5 years (57.6%). In terms of scale, most of them are small and medium enterprises (small: 20.3%; medium: 51.3%). These enterprises source materials/ semi-finished products from both domestic and imported sources. The main product distribution markets are the domestic market, the US, the EU, China, etc.

Table 3: Sample Characteristics

Variable	Categories	Frequency (N)	(N=236) Percentage (%)
Type of business	State-owned enterprise	4	1.7
	Private Enterprise	220	93.22
	Foreign-invested enterprise	12	5.08
Operating time	Less than 1 year	22	9.3
	From 1 to 5 years	78	33.1
	Over 5 years	136	57.6
Scale of business	Less than 3 billion VND	19	8.1
	From 3 to 20 billion VND	48	20.3
	From 20 to 100 billion VND	121	51.3
	Over 100 billion VND	48	20.3
Source of raw materials/ semi-finished products	Domestic	128	54.24
	Import	204	86.44
Distribution market	Domestic market	180	76.27
	The USA	116	49.15
	Japan	52	22.03
	China	60	25.42
	EU	88	37.23
	South Korea	44	18.64
	England	20	8.47

4. Results and Discussion

4.1. Preliminary assessment of the reliability of the scale in the research model

Cronbach's Alpha

Cronbach's Alpha coefficient of dynamic capability, competitiveness, and business efficiency are 0.887; 0.87;

0.89. The results of testing the components of the scale all have Cronbach's Alpha > 0.6, and none of the measured variables correlate less than 0.3. Thus, all observed variables meet the reliability requirements and can be used when analyzing exploratory factors.

Exploratory Factor Analysis (EFA)

After the scale of influencing factors was tested for Cronbach's Alpha reliability coefficient with 16 variables, the authors continued to conduct exploratory factor analysis (EFA).

Table 4: The results of exploratory factor analysis

KMO coefficient		0.86
Bartlett's test	Chi-Square	2179.04
	df	120
	Sig	0,000
Eigenvalue		1.90
Total Variance Explained		59.27

The results obtained when analyzing exploratory factors for the model with PAF extraction and Promax rotation wholly meet the testing standards. The results show that the KMO coefficient is 0.86, in the range (0.5, 1), proving that factor analysis is appropriate. At the same time, the sig value in Bartlett's test equals 0.000 < 0.05, showing that the Bartlett test is statistically significant or the observed variables in the factor are correlated. Next, the Eigenvalue is 1.9, surpasses 1, lying in the 3rd row in the table of explained variables. It shows that there are three groups of factors representing the variation that can be explained. Total variance explained = 59.27% > 50% indicates that these factors groups explain 59.27% of the variation of observed variables.

Table 5: Sample Matrix

Observed variables	Factors		
	1	2	3
dc2	0.836		
dc4	0.821		
dc3	0.769		
dc6	0.754		
dc1	0.678		
dc5	0.673		
c2		0.841	
c4		0.814	
c5		0.697	
c6		0.690	
c1		0.685	
c3		0.609	
be1			0.919
be2			0.819
be4			0.774
be3			0.757

The rotation matrix table consists of three factors corresponding to the number of factors included in the model. In addition, each group of elements converges with the observed variables as the original scale and has a load coefficient greater than 0.5. Thus, after the EFA, no observed variables were removed, and the model with the input data set was wholly suitable for inclusion in CFA and SEM analysis.

4.2. Structural Equation Modeling Analysis

Evaluating Model fit by CFA

The author conducts CFA analysis for the full scale of the model to establish a well-suited measurement model used to test the structural equation modeling. The obtained results completely meet the criteria for testing the fit of the model (Model fit), specifically as follows: CMIN/df=1.800; GFI=0.914; CFI=0.963; RMSEA=0.058. In particular, the CFI index was great, and the rest of the indexes were at a good level (Hair, Black, Babin, & Anderson, 2010), which indicates that the research model is suitable.

Checking the reliability and validity

The standardized load coefficient of the variables reaches the ideal level when over 0.7 and is acceptable with coefficients greater than 0.5. The lowest coefficient of pairs in this study is 0.569 for competitiveness - c3, while the highest is for business efficiency - be4, at 0.89. In conclusion, the variables are statistically significant on the scale.

Table 6: The standardized load coefficient

			Estimate
dc2	<---	dc	0.790
dc4	<---	dc	0.813
dc3	<---	dc	0.766
dc6	<---	dc	0.781
dc1	<---	dc	0.673
dc5	<---	dc	0.759
c2	<---	c	0.616
c4	<---	c	0.822
c5	<---	c	0.774
c6	<---	c	0.807
c1	<---	c	0.636
c3	<---	c	0.569
be1	<---	be	0.843
be2	<---	be	0.805
be4	<---	be	0.890
be3	<---	be	0.818

CR is all greater than 0.7, so the scale is reliable. AVE > 0.5 indicates convergence is guaranteed. MSV is smaller than AVE, while SQRTAVE is larger than the correlation

coefficient between variables, so the divergence is guaranteed. Thus, the model satisfies the requirements of convergence, divergence, and reliability tests.

Table 7: CFA test indicators

	CR	AVE	MSV	MaxR(H)	SQRTAVE
cc	0.857	0.506	0.187	0.878	0.711
dc	0.894	0.585	0.219	0.898	0.765
bbe	0.905	0.705	0.219	0.910	0.840

Table 8: Correlation of variables

	c	dc	be
c	**1.000**		
dc	0.433	**1.000**	
be	0.334	0.468	**1.000**

Table 9: Regression coefficients

Hypothesis	The relationship between variables	Estimated coefficient	S.E.	C.R.	P	Evaluation
H1	c <--- dc	0.386	0.071	5.395	***	Acceptable
H2	be <--- dc	0.471	0.089	5.304	***	Acceptable
H3	be <--- c	0.215	0.097	2.212	0.027	Acceptable

The regression table shows that the impact of dynamic capability on business efficiency and competitiveness is 0.471; 0.386 and statistically significant at the 1% level (AMOS sign *** is sig equal to 0.000). And competitiveness with P_value = 0.027 will be statistically significant at the 5% level. Thus, the regression weights expressing the relationship between the three variables are all statistically significant, so the initial hypotheses are accepted, these relationships are theoretically valid.

Table 10: Standardized regression coefficients

The relationship between variables	Estimated coefficient
c <--- dc	0.433
be <--- dc	0.398
be <--- c	0.162

Based on the standardized regression coefficients results of the observed variables, we can see the interaction of the

variables, all of which are consistent with the original hypotheses that the authors put forward. If dc increases by 1 unit, the be increases by 0.398 units in the condition that other factors remain unchanged. If dc increases by 1 unit, then c increases by 0.433 units if other factors stay the same. If c increases by 1 unit, then be increases by 0.162 units.

4.3. Multigroup analysis in AMOS

The author carried out a Multigroup analysis to assess the difference in the impact of supply chain dynamic capability on competitiveness and business efficiency between different values of qualitative variables: operating time and business scale.

Multigroup analysis for the operating time variable

Table 11: Results of evaluating the Chi-square difference by degrees of freedom between the variable and invariable models of the operating time variable

	Chi-square	df
Invariable	510.666	297
Variable	501.782	291
Difference	8.884	6
P-value	0.18020770	

P-value = 0.18 > 0.05, so there is no difference in the impact of variables in the model between enterprises with different years of operation.

Multigroup analysis for the firm scale variable

Table 12: Results of evaluating the Chi-square difference by degrees of freedom between the variable and invariable models of the firm scale variable

	Chi-square	df
Invariable	735.431	397
Variable	715.581	388
Difference	19.850	9
P-value	0.01886101	

P-value=0.01886 < 0.05, so there is a difference in the impact of supply chain dynamic capability on competitiveness and business efficiency among enterprises with different capitals.

Table 13: Results of Multigroup analysis of the variable firm scale

|	<3 billions (Micro-enterprise)		3 - 20 billion (Small enterprise)		20 - 100 billion (Medium Enterprise)		>100 billions (Large enterprise)	
	Standardized Regression Weights	P-value	Standardized Regression Weights	P-value	Standardized Regression Weights	P-value	Standardized Regression Weights	P-value
c <--dc	0.179	0.478	0.518	0.066	0.480	***	0.570	0.001
be <--dc	0.779	0.003	0.258	0.134	0.298	0.005	0.636	***
be <--c	0.120	0.412	0.118	0.522	0.261	0.016	0.072	0.638
R^2 (c)	0.032		0.269		0.230		0.325	
R^2 (be)	0.654		0.112		0.231		0.462	

The analysis results show that the influence of supply chain dynamic capability on competitiveness is lower in medium enterprises than in large ones (0.48<0.57). In medium enterprises, the impact of supply chain dynamic capability on business efficiency is lower than that of large firms (0.298<0.636). The R^2 of variables c and be of medium enterprises are 0.23 and 0.325, respectively. Meanwhile, these figures are 0.231 and 0.462 for large businesses.

5. Discussion and Conclusions

5.1. Discussion

Through testing, the initial hypotheses are all accepted, and these relationships are theoretically valid. The positive weights represent factors that have the same-direction effect on other variables.
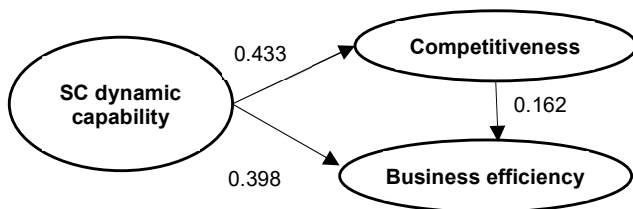
Figure 2: Assessment of the impact of supply chain dynamic capability on competitiveness and business efficiency of wood enterprises in the North of Vietnam

According to the research results, supply chain dynamic capability has a positive impact on competitiveness and business efficiency with estimated coefficients of 0.433 and 0.398 with trivial P-value (less than 0.001). This result is consistent with previous studies. In particular, Dang and Le (2018) showed that supply chain dynamic capability has a positive influence on the competitive advantage and business efficiency of Vietnamese enterprises with coefficients of 0.288 and 0.511 and P-value less than 0.05. The authors' research on enterprises in the wood industry shows the impact of supply chain dynamic capability on competitiveness with an estimated coefficient of 0.433. This figure is higher than that of Dang and Le (2018) of Vietnamese enterprises with an estimated coefficient of 0.288. It can be explained that the study of Dang and Le (2018) illustrated the impact of supply chain dynamic capability on competitiveness and business efficiency for manufacturing enterprises in Vietnam in general. In this study, the authors go into detail on the analysis of the impact of supply chain dynamic capability on the wood industry. Besides, the wood industry has distinct characteristics in

comparison with other industries. More specifically, the links in the wood chain have a close influence on each other. The quality of input wood materials significantly determines the quality of wood products. It requires businesses to have the knowledge and rigorous association to not break the supply chain. In addition, wood and wood products are not essential items. Hence, wood enterprises need to have good adaptability and creativity to respond to changes in the environment, such as the Covid-19 pandemic. When the pandemic broke out, businesses with the supply chain dynamic capability could maintain good links and restructure the chain. Thereby, they can have a competitive advantage and maintain their business efficiency.

In addition, in several related studies, Hong et al. (2017) demonstrated that supply chain dynamic capability considerably affects the environmental efficiency of enterprises. Besides, it directly and positively influences firm competitiveness, with an estimated regression coefficient of 0.74 and a P-value under 0.05 (Liao et al., 2017). The research results also show that competitiveness, with an estimated coefficient of 0.162, has a positive impact on business efficiency. In detail, an increase in competitiveness of 1 unit will contribute to a rise of 0.162 units in the business efficiency of the enterprise.

The previous studies oftenfocused on assessing the impact of supply chain dynamic capability on competitiveness and business efficiency. However, in this study, the authors also evaluated the differences in the influence of supply chain dynamic capability on competitiveness and business efficiency among enterprises with different operating times and scales. According to the results of multigroup analysis, there is no difference in the impact of variables in enterprises with different years of operation. Nevertheless, the distinct scales of firms would result in differences in the influence of variables. Specifically, the impact of supply chain dynamic capability on competitiveness and business efficiency is smaller in medium enterprises than in large ones. In general, the influence trend increases with the size of the enterprise. The larger the scale, the more profound the impact of supply chain dynamic capability on the competitiveness and business efficiency of the enterprise. For large-scale wood firms, the specialization is presented more clearly, and there is a tendency to integrate more deeply into the global value chain (which is broader and more complex). As a result, the supply chain of the business will be more complicated and cumbersome. Therefore, enterprises with a dynamic supply chain system will have a better competitive advantage.

5.2. Conclusions

Thus, supply chain dynamic capability has a positive impact on the competitive advantages and business results.

Supply chains are subject to change with technology cycles. Hence, continuously acquiring knowledge of management process innovation leads to product and process readiness, enhancing competitive advantage and business efficiency. Enterprises focusing on developing the relationships among partners in the chain to ensure the rigor, connection, and sharing of information will create a smooth and efficient chain system. Therefore, they could gain competitive advantages of quality, price, and time. Besides, when businesses acquire market-oriented knowledge, their supply chains function better in line with market trends. In addition to absorbing, enterprises have supply chain creativity that brings breakthroughs to differentiate themselves from competitors, leading to improved competitive advantages and business performance. From this result, the authors assume that it is essential to continuously invest in developing supply chain dynamic capability through learning new knowledge about the supply chain, boldly offering innovations to meet the market needs.

It can be seen that the dynamic capability of the supply chain dynamic plays a crucial part in improving the competitive advantages and business results of enterprises. Specifically, in the wood industry, when the links in the chain have a tight influence on each other, the quality of input wood materials notably determines the quality of wood products, requiring businesses to acquire the knowledge, closely linked, and keep the supply chain. In addition, wood and wood products are not indispensable items, urging businesses to have strategies to stimulate demand for wood products. Improving supply chain dynamic capability helps enterprises enhance their awareness of opportunities and challenges in the business environment. Thereby, they would have appropriate policy strategies to improve competitiveness and business efficiency. Besides, timber enterprises need to be well-adapt and creative to respond to environmental alterations, such as the Covid-19 pandemic. When the pandemic broke out, businesses with supply chain dynamic capability could maintain good links and restructure the chain. Thereby, it helps firms gain a competitive advantage and maintain their business efficiency.

In addition, the study also illustrates that the larger the enterprise, the more intense the impact of supply chain dynamics on competitiveness and business efficiency. However, there is no difference for enterprises with different years of operation. Thereby, large-scale firms are encouraged to focus on developing the dynamic capability of the supply chain. In addition, it is advisable that small businesses, woodcraft villages, etc., can link together, specialize work to form a big operating block, and develop, take advantage of supply chain dynamic capability.

In the current flat economy, Vietnam is a developing country without competitive advantages of capital, resources. As a result, focusing on developing supply chain dynamic capability will be a potential solution to improve the competitiveness of Vietnam's wood enterprises in the global market. Simultaneously, developing supply chain dynamic capability is also a crucial solution to help Vietnamese wood enterprises dominate the domestic market. In Vietnam, the domestic market is considered a high potential wood and wood product distribution market, with over 90 million people. Moreover, as Vietnam is a developing country, the demand for building and construction of houses, hotels, etc., is very high. Therefore, many wood export enterprises have gradually shifted and balanced the structure between exports and domestic products to avoid risks, especially in the context of the complicated Covid-19 epidemic. To dominate the market, enterprises in the wood industry should regularly change their models according to the trend and focus on quality and price. It is also advisable to exploit the distribution channel system in provinces and cities across the country. Increasing customer access through the multi-channel distribution system is also a solution worth considering, especially in the context of Vietnam's wood market today.

5.3. Limitation and future research

Due to time and resource constraints, the actual survey was only carried out with 236 enterprises, while the surveyed firms are mainly in the North of Vietnam. The authors propose that the following research direction could concentrate on measuring the factors affecting the dynamic capability of the wood supply chain. Besides, future research can improve the sample representativeness by surveying many enterprises across Vietnam, with an equal number of businesses in the North, Central, and South.

References

Ambrosini, V., & Bowman, C. (2009). What are dynamic capabilities and are they a useful construct in strategic management? *International Journal of Management Reviews, 11*(1), 29-49.

Aslam, H., & Azhar, T.M. (2018). Dynamic Capabilities and Performance: A Supply Chain Perspective. *Pakistan Journal of Commerce and Social Sciences, 12*(1), 198-213.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99-120.

Beske, P. (2012). Dynamic capabilities and sustainable supply chain management. *International Journal of Physical Distribution Logistics Management, 42(*2), 372-387.

Beske, P., Land, A., & Seuring, S. (2014). Sustainable supply chain management practices and dynamic capabilities in the food industry: A critical analysis of the literature. *International Journal of Production Economics, 152*, 131-143. https://doi.org/10.1016/j.ijpe.2013.12.026

Bharadwaj, N., & Dong, Y. (2014). Toward further understanding the market-sensing capability–value creation relationship. *Journal of Product Innovation Management*, *31*(4), 799-813.

Braunscheidel, M.J., & Suresh, N.C. (2009). The organizational antecedents of a firm's supply chain agility for risk mitigation and response. *Journal of Operations Management*, *27*(2), 119-140.

Christopher, M. (2005). *Logistics and Supply Chain management* (3rd edition). Pearson.

Dang, Q.D, & Le, T.T. (2018). The Impact of Supply Chain Dynamic to Competitiveness and Business Efficiency in Vietnamese Enterprises. *International Journal of Economics and Finance*, *10*(11), 103-109. https://doi.org/10.5539/ijef.v10n11p103

Day, G.S. (1992). Continuous learning about markets. *Planning Review*, *20*(5), 47-49.

Day, G.S. (1994). The capabilities of market-driven organizations. *The Journal of Marketing, 58*(4), 37-52. https://doi.org/10.1177/002224299405800404

Dubey, R., Altay, N., Gunasekaran, A., Blome, C., Papadopoulos, T., & Childe, S.J. (2018). Supply chain agility, adaptability and alignment: empirical evidence from the Indian auto components industry. *International Journal of Operations & Production Management, 38*(1), 129-148.

Eisenhardt, K., & Martin, J. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, *21*(10-11), 1105-1121. https://doi.org/10.1002/1097-0266(200010/11)21:10/11%3C1105:aid-smj133%3E3.0.co;2-e

Gligor, D. M., & Holcomb, M. C. (2012). Antecedents and consequences of supply chain agility: Establishing the link to firm performance. *Journal of Business Logistics, 33*(4), 295-308.

Gligor, D., & Holcomb, M. (2014). The road to supply chain agility: An RBV perspective on the role of logistics capabilities. *The International Journal of Logistics Management, 25*(1), 160-179.

Hair, J. F., Black, W. C., Babin, B.J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th Edition). Upper Saddle River, NJ: Prentice Hall.

Hong, J., Zhang, Y., & Ding, M. (2017). Sustainable supply chain management practices, supply chain dynamic capabilities, and enterprise performance. *Journal of Cleaner Production, 172*, 3508- 3519.

Ketchen, D.J., & Hult, G.T.M. (2007). Bridging organization theory and supply chain management: The case of best value supply chains. *Journal of Operations Management*, *25*(2), 573-580.

Kristal, M. M., Huang, X., & Roth, A. V. (2010). The effect of an ambidextrous supply chain strategy on combinative competitive capabilities and business performance. *Journal of Operations Management, 28*(5), 415-429. doi:10.1016/j.jom.2009.12.002.

Lee, S. M., & Rha, J. S. (2016). Ambidextrous supply chain as a dynamic capability: Building a resilient supply chain. *Management Decision*, *54*(1), 2-23.

Liao, S. H., Hu, D. C., & Ding, L. W. (2017). Assessing the influence of supply chain collaboration value innovation, supply chain capability and competitive advantage in Taiwan's networking communication industry. *International Journal of Production Economics, 191*, 143-153.

Luo, Y. (2000). Dynamic capabilities in international expansion. *Journal of World Business, 35*, 355- 378.

Madhok, A., & Osegowitsch, T. (2000). The international biotechnology industry: A dynamic capabilities perspective. *Journal of International Business Studies*, *31*(2), 325-335.

Masteika, I., & Cepinskis, J. (2015). Dynamic Capabilities in Supply Chain Management. *Procedia - Social and Behavioral Sciences, 213,* 830-835. doi: 10.1016/j.sbspro.2015.11.485

Micheal E. P., (1908). *Competitive strategy: Techniques for Analyzing Industries and Competitors*. Simon and Schuster.

Petroni, A. (1998). The analysis of dynamic capabilities in a competence-oriented organization. *Technovation, 18*(3), 179-189.

Porter, M. (1985). *Competitive Advantage*. (Nguyen Phuc Hoang, Trans.). Hanoi, Vietnam: Hanoi Youth.

Prabowo, H., Sriwidadi, T., & Ikhsan, R.B. (2021). The Influence of Dynamic Capability on Sustainable Competitive Advantage: An Empirical Study of Small Businesses in Indonesia. *The Journal of Asian Finance, Economics and Business, 8*(6), 949-959.

Rindova, V.P., & Kotha, S. (2001). Continuous 'mor- phing': Competing through dynamic capabilities, form, and function. *Academy of Management Journal, 44*, 1263-1280.

Schoenherr, T., & Swink, M. (2015). The roles of supply chain intelligence and adaptability in new product launch success. *Decision Sciences*, *46*(5), 901-936.

Sijabat, E.A.S., Nimran, U., Utami, H.N., & Prasetya, A. (2020). The Effects of Dynamic Capabilities, Entrepreneurial Creativity and Ambidextrous Innovation on Firm's Competitiveness. *The Journal of Asian Finance, Economics and Business, 8*(1), 711-721.

Teece, D.J, Pisano, G., & Shuen, A. (1997). Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, *18*(7), 509-533. https://doi.org/10.1002/(sici)1097-0266 (199708)18:7% 3C509:aid-smj882%3E3.0.co;2-z

Teece, D.J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, *28*(13), 1319-1350. https://doi.org/10.1002/smj.640

Trainor, K.J., Rapp, A., Beitelspacher, L.S., & Schillewaert, N., (2011). Integrating information technology and marketing: An examination of the drivers and outcomes of e-Marketing capability. *Industrial Marketing Management, 40*(1), 162-174.

Vu, H.M. (2020). A review of dynamic capabilities, innovation capabilities, entrepreneurial capabilities and their consequences. *Journal of Asian Finance, Economics and Bussiness, 7*(8), 485-494.

Wang, C.L., & Ahmed, P.K. (2004). The development and validation of the organisational innovativeness construct using confirmatory factor analysis. *European Journal of Innovation Management*, *7*(4), 303-313.

Wang, C.L., & Ahmed, P.K. (2007). Dynamic capabilities: A review and research agenda. *International Journal of Management Reviews*, *9*(1), 31-51.

Zott, C. (2003). Dynamic capabilities and the emergence of intraindustry differential firm performance: Insights from a simulation study. *Strategic Management Journal*, *24*(2), 97-125.