Impact of supply chain linkages on the performance of enterprises specializing in aluminum profiles: The case of Vietnam

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CHRONICLE	ABSTRACT
	The objective of this paper is to assess the impact of supply chain linkage on the performance of aluminum profiles enterprises in Northern Vietnam. After qualitative research results, the research team has discovered a new variable in the linkage model which is the Policy linkage. The study performs official quantitative research on 289 aluminum profiles in Northern Vietnam and the results were analyzed on SPSS 22 and Smart PLS 3.0 software. The results indicate that the links in the supply chain include: Supply linkage, customer linkage, policy linkage and internal linkage all contribute significantly to supply chain management efficiency. Moreover, the supply chain management efficiency had a positive effect on business performance of aluminum profiles in the northern region of Vietnam. Finally, the study gives solutions and recommendations to help aluminum bar enterprises shape the northern region of Vietnam to better link in the supply chain and improve business performance.

1. Introduction

The supply chain is not a new concept in the world, but for Vietnamese enterprises, it is fresh and undiscovered area. In fact, many enterprises do not fully acknowledge the significant importance of the supply chain in global competitive environment today. Therefore, in order to maintain its position, improve competitiveness, expand market share, reduce costs and to take the initiative in production and business, enterprises are required to thoroughly understand the role of supply chain (Van der Vaart & Van Donk, 2008). The establishment of appropriate supply chain is vital for every enterprise and industry, but it is necessary to identify entities in the supply chain and enable entities to strengthen mutual cooperation for sustainability in the journey of existence and development of the enterprise as well as the industry. No matter where the enterprise locates, how big it is, and what sort of scope it has, improvement of its own competitiveness is becoming more important than ever. There are many ways

for enterprises to improve their competitiveness such as collaboration with suppliers and distributors within the supply chain of the enterprise.

According to the Vietnam Aluminum Association, in the past 4 years, the amount of Chinese aluminum imported into Vietnam has increased by nearly 9 times. Particularly, Vietnam imported only about 7,000 tons of Chinese aluminum in 2015, but this figure reached up to 62,000 tons in 2018. In 2016, the amount of Vietnamese aluminum accounted for about 70% of the domestic market share, but in 2019, the amount of Chinese aluminum made up 70% of the market share and the domestic aluminum covered only 30%. Along with the massive import, the dumping margin of Chinese aluminum also increased by 20-35%. The Ministry of Industry and Trade forecasts that if the situation maintains until 2020, domestic aluminum enterprises will be in danger of bankruptcy.

The domestic aluminum producers are struggling to survive in price competition, not only producing but also researching on rigorous standards of quality. The consequences of unsustainable development are not difficult to explain when looking back on a turbulent year of the domestic aluminum production industry. Therefore, what should enterprises do to avoid the risks of such market nudges to improve its performance? Effective supply chain management by linkage with suppliers, customers, government policies and internal linkage is optimal plan in the competitive market and information asymmetry today. Especially for enterprises specializing in aluminum profiles.

In the trend of the Industrial Revolution 4.0, building material industry is expected to make great progress. The aluminum producers in Vietnam need to develop more advanced aluminum systems, enhance application of production technology to create competitive advantages of brands and enterprises in the market. At the same time, it is also necessary to increase the awareness of self-defense by improving product quality, optimizing production processes to have reasonable costs, boosting purchasing power of consumer. Aluminum industry is a fresh area, therefore, aluminum producers at the early stage of participation of supply chain should set up an integrated strategy in the supply chain in order to develop sustainably in the international and domestic market.

This article is designed to assess the impact of the supply chain linkages on performance of supply chain management and performance of enterprises specializing in aluminum profiles in the Northern region of Vietnam. The structure of the article excluding introduction part includes study overview; study methodology; study result and conclusion.

2. Literature review

2.1. Supply chain linkage

Up to now, there have been many studies on supply chain in many different approaches and there are many different definitions of the term "supply chain".

The combination among factors in the supply chain has been studied by many authors in the world. According to Carter et al. (2000), the studied issue was: Should relations between enterprises be extended or not? how the relations? with which enterprises? or Cachon (1999), Shah and Ram (2006) discussed the benefits of interaction within the supply chain. Davis (1993) and Ramcharran (2001), academically and practically, both of them discussed the potential benefits of supply chain interaction.

In supply chain management, supply chain cooperation is defined as two or more autonomous companies working together to set up plan and implement supply chain activities. It can bring significant benefits and advantages to its partners (Chen et al., 2004; Lau et al. 2010; Aras et al., 2010). It has been known as a cooperative strategy when one or more companies or business units working together to create mutual benefits (Van et al. 2008; Baron & Kenny, 1986). There are two main types of supply chain collaboration, vertical collaboration and horizontal collaboration. Vertical collaboration is a collaboration where two or more organizations of different levels or stages in the supply chain share their responsibilities, resources, and performance information to serve end-users relatively similarly; while horizontal collaboration is inter-organizational relationships between two or more companies at

the same level or stage in the supply chain to allow easier to work and cooperate to achieve common goals (Vickery et al. 2003; Agyemang & Ansong, 2017).

Vertical and horizontal supply chain linkages are supply chain management strategies being applied by companies to take advantage of the available advantages. Thereby, it increases sales and contributes to increase of competitiveness against other companies. An effective supply chain will be a measure for enterprise success, thereby pleasing their customers. The business market creates more and more fierce competition and therefore cooperation is a matter, of course, to increase efficiency and limit risks instead of doing individually. Coping with the challenges, enterprises are required to take specific strategies; safe and effective those based on existing capabilities of these enterprises. Vertical and horizontal supply chain linkages are guideline for enterprise to manage their organizations and relationships with other companies in the same supply/value chain to improve processes and supply chain performance. Through investment in added value and activities aiming to help all members in supply chain to get benefit; integration of vertical and horizontal supply chains helps enterprises save costs, increase profits and operate efficiently.

2.2. Supply chain management performance

The concept of Supply Chain Management (SCM) was introduced in the 1980s and it was initially related to purchase, storage, and shipping management within the supply chain. Supply chain management includes all planning and management activities related to supply, bidding, transformation and logistics management activities. It is not less important to include coordination as cooperation with partners such as suppliers, intermediaries, third party service providers, and customers. Essentially, supply chain management is integrated with supply and demand management within and outside companies. Supply chain management is a function integrated with the main responsibility for connecting key business functions and business processes within companies into a cohesive and high performance business model. It includes all logistics management activities mentioned above, as well as manufacturing operations, and promotes collaborative processes and activities with the field of marketing, sales, logistics, finance, information technology and customer service.

In the period before 2000, the areas of study on supply chain management were associated with performance and supply chain performance assessment; supply chain integration, supply chain network design, etc. It aimed to create potential advantages for enterprises such as reducing costs, increasing customer satisfaction, revenue, profits, competitiveness, streamlining operations. By the mid-2000s, supply chain studies focused on clarifying the rationale and some principles of supply chain operations, the relationship between supply chain management and performance, such as: issues related to supply chain development strategies, models, methods and performance frameworks and supply chain performance; information sharing and collaboration among supply chain partners, identification of the best practices that facilitate linkage and integration of supply chain processes, application of the management information systems and latest Internet technologies for efficient promotion and performance throughout the supply chain.

Supply chain management is very important in the operations of enterprise because it runs through almost all enterprise's operations, from calculating purchase of raw materials, selection of suppliers, production method, where and how to distribute the final products. Effective supply chain management helps enterprises reduce costs, increase competitiveness, manage product quality, and provide products in a timely manner to consumers. A supply chain is considered to be effective when it satisfies the following factors:

- Consistent with strategy, business goals of company. An effective supply chain needs to consistent with the company's strategy in each stage, in accordance with resources, market, and company's strength.

- Combine with customer needs: with an effective supply chain, enterprises can make products that fit the market segment, and provide goods/products with quality in a timely manner to customers.

- Combine with company's position: current position of company, strong brand, famous level, and scale. Each position has specific selection of different suppliers and customers.

- Adapt to change: In the supply chain, the parties will communicate information with each other about market situation and customers. Therefore, in order to manage the supply chain effectively, enterprises can make timely change decisions in accordance with the market situation, competitors, competitiveness.

2.3. Business performance

In the current market mechanism in Vietnam, the long-term goal of enterprises is to do business effectively and maximize profits. The changing business environment requires each enterprise to take appropriate business strategies. Business is an art that requires rapid decision and awareness of matter at strategic level. Business performance is always associated with business activities and it can be considered on many aspects.

In essence, the concept of business performance is to express the quality of business activities, reflect level of using resources (materials, equipment & machinery, workforce and capital) to achieve the ultimate goal of all business activities to maximize profit.

High or low business performance depends on the level of organization of production and management of each enterprise (Phan et al., 2019). Business performance is an economic category in depth, reflecting level of exploitation of resources and level of cost for such resources in the reproduction process to achieve business goals (Phan et al., 2019). The production and business performance today become important for economic growth and they are basis for assessing implementation of economic goals of the enterprise in each stage.

Criteria for assessment of business performance: There are two criteria to evaluate business performance of an enterprise: the one related to financial performance and the one related to socio-economic performance.

Five main contents of financial performance include: (1) short-term solvency, (2) business activities, (3) financial leverage, (4) profitability capacity, and (5) enterprise value considered through groups of common evaluation index (Saeidi et al., 2015; Phan et al., 2019; Nguyen et al., 2016).

Because of requirements of sustainable development in the national economy, enterprises, in addition to business activities, must achieve performance to survive and development and must also achieve socio-economic performance. Group of criteria in terms of socio-economic performance includes the following: Increase budget revenue, Create more jobs for workers, Improve workers' lives and Redistribute social returns. In a market economy, in order to get achievement, enterprises are required to regularly apply scientific advances, improve operation methods, improve production and business management organizations in order to improve productivity, quality and performance. The absolute business performance is the profit earned. It is the basis for expanded reproduction and improved workers' lives. For every enterprise, especially enterprises operating in the market mechanism, improvement of business performance plays an important role in the existence and development of enterprises. In addition, it also helps enterprises compete in the market, invest, expand, renovate and modernize technical facilities for production and business.

3. Methodology

3.1. Sample

Aluminum profiles are treated with metal to maximize physical properties, facilitate engineers in design and production. Aluminum profiles usually have many outstanding advantages compared with other common aluminum types. Products made of aluminum profiles can be easily processed to create more sophisticated, impressive spaces than other materials. The aluminum profiles used in construction sector are very solid, resistant, not warped, oxidized, rusted over time. Aluminum profiles is easy to

combine with other materials, especially glass. It can create a variety of products to make more selection for customers. Aluminum profiles has soundproofing, good insulation properties in the harsh weather. In addition, the aluminum surface is electrostatic sprayed with a high-class paint, therefore it is often more durable, unoxidized or impoverished. Aluminum profiles have luxurious design suitable for architectural works such as offices, buildings, apartments, etc. Especially, aluminum products are very durable, strong impact resistance but lightweight, easy to assemble, therefore it is quite popular.

The aluminum profile industry is fresh; however, aluminum profile plays a very important role in Vietnam's economy. Aluminum profiles are input materials for many other industries and they are directly produced for consumption.

In order to assess the level of cooperation/linkage in the supply chain of enterprises specializing in aluminum profiles in the Northern region, we sent survey form to producers of aluminum profiles in the Northern region based on random sample selection from the list of producers of aluminum profiles. All 360 survey forms have sent to directors, deputy directors, managers of enterprises specializing in aluminum profiles in the Northern region for 3 months from July to October 2019 and managed to obtain 318 survey forms. After sorting and cleaning data, the remaining valid 289 ones were included in the analysis.

3.2. Research model

The study model was developed from the study of Lee et al. (2007), after we conducted qualitative study, a new variable added to the model was discovered as "policy linkage". In the supply chain management activities of any enterprise, especially those specializing in aluminum profiles in the Northern region, the State's policies greatly influence to the supply chain management performance and efficient performance of the enterprise. Therefore, after the qualitative study process was finished, we have added the "policy linkage" variable into the study model. Therefore, study model is follows:
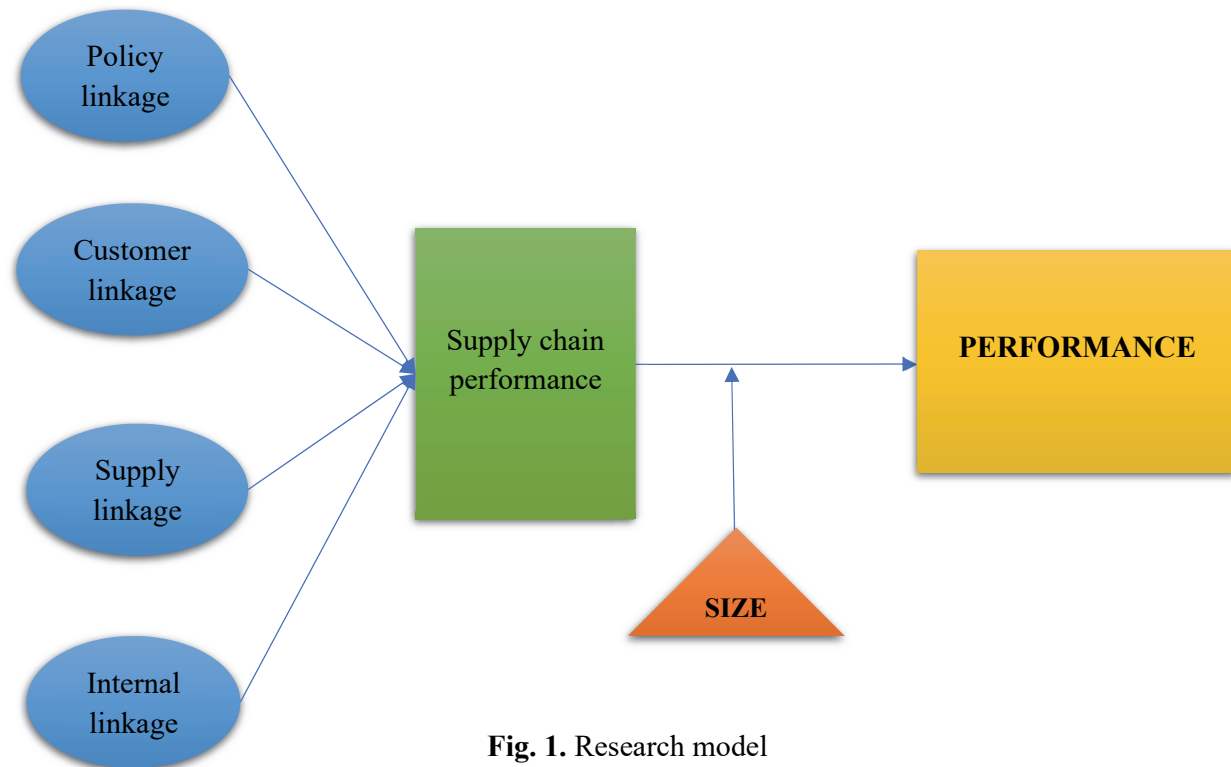

Fig. 1. Research model

and the study variables are as follows:

Supply chain management performance: This item is the efficiency linked from suppliers, customers, internal and in conjunction with the State and governmental policies. Scales of efficient supply chain

management were developed from the study of Lee at al. (2007) and developed from qualitative study of study teams. All measuring factors are measured by 5 point Likert scale with point where 1 represents strongly agree and 5 denotes strongly disagree.

Performance is measured through 2 aspects: financial performance includes the indicators related to financial performance such as: ROA, ROE, ROS, solvency, and socio-economic benefits such as: contribution to budget, assurance of employee's lives, customer satisfaction, enterprise's reputation developed from study of Phan et al. (2019). All measuring factors are measured by 5 point Likert scale with point 1 is strongly agree to 5 is strongly disagree. The study hypotheses are as follows:

H_1: Policy linkage has positive effect on supply chain performance.

H_2: Customer linkage has positive effect on supply chain performance.

H_3: Supply linkage has positive effect on supply chain performance.

H_4: Internal linkage has positive effect on supply chain performance.

H_5: Supply chain performance has positive effect on performance.

H_6: Size plays a moderate role in the relationship between supply chain performance and performance.

3.3. Analytical techniques

We use quantitative analysis techniques based on SPSS 22 software and Smart PLS 3.0. First, when collecting survey data about us, we entered the survey data with valid questionnaires into Excel 2016. Then we proceeded to filter the missing questionnaires and removed the incomplete questionnaires. The remaining 289 valid votes were entered into SPSS 22 to assess the reliability of the scale and analyzed the EFA discovery factor. The reliability of the scale is performed by Cronbach's Alpha coefficient used to eliminate garbage variables before conducting factor analysis. The reliability of the variables in the scale is based on Cronbach's Alpha test coefficient of scale components and Cronbach's Alpha coefficient of each measurement variable. Variables with a total correlation coefficient - variables smaller than 0.3 will be excluded. A scale has good reliability when it varies in the range [0.7 - 0.8]. If Cronbach's Alpha >= 0.6 is a scale that is acceptable for reliability (Nunnally & Berndstein, 1994). The method of factor discovery analysis - EFA belongs to the multi-analysis group.

Interdependence techniques, that is, no sub variables and independent variables that are based on the correlation between variables (interrelationship). EFA is used to shorten a set of k variables into a set F (F <k) of more significant factors. The basis of this deduction is based on the linear relationship between factors and observed variables. The EFA method has been widely used in research for preliminary assessment of measurement scales. The essence of this method is based on the collected data to find out the constituent elements and confirm the model of the constituent elements that are available through previous studies or theoretical models. We have used extracted variance to evaluate the scale: The scale is accepted when the variance extracted> 50% and Eigenvalue> 1 (Hair et al., 2014). Factor loading factor (Factor loading) ≥ 0.5 (Hair et al., 2014). After removing the scales that do not qualify for initial reliability, we enter data into the Smart PLS 3.0 software to conduct research model tests and research hypotheses.

+ Evaluating general reliability "measures the reliability of the set of observed variables measuring a concept (factor) and the CA reliability factor measures intrinsic consistency throughout the set of variables. Observe the answer. Composite reliability is significant when the value is greater than 0.7 and the CA reliability is 0.6 or more" (Hair et al., 2014).

+ Assess the convergence value of the scale: "The scale achieves the convergence value when the normalized weights (Outer loading) of the scale are both high (> 0.5) and statistically significant (p <0.05) (Henseler et al., 2009) and the total variance extracted reflect the overall variance of observed variables explained by the latent variable (Henseler et al., 2015) that are significant when values are above 0.5 ". (Hair et al., 2014)

+ Evaluation of discriminant value: According to Henseler et al. (2009), discriminant value is the degree of distinguishing a concept of a specific latent variable from the concept of other potential variables.

+ Multicollinearity detection: Variance Inflation Factor (VIF) when VIF <10 is satisfied (Henseler et al., 2009).

+ Measure the overall coefficient (R-square value), which is an indicator to measure the suitability of the model of the data (explanatory power of the model). Henseler et al. (2009) describe R-square values of 0.67, 0.33 and 0.19 in PLS path models which are strong, medium and weak respectively.

+ Path Coefficient (impact weight) of PLS structure model: level the impact of concepts together, can be interpreted as the standard beta of least squares regression, providing an empirical confirmation of a partial termite. When this coefficient bears the sign (+) it means the direct effect and when it is marked with (-) it means the opposite effect.

+ T-value: If the T-value is> 1.96, the test is statistically significant at 5%.

+ According to Henseler et al. (2015, 2016) to consider the effect of exogenous variables on endogenous variables, it is necessary to evaluate the effect factor f^2. When f^2 is at 0.02 levels; 0.15 and 0.35, we can conclude that the impact level is corresponding to weak, fair and strong.

+ Bootstrap estimation test: Non-parametric Bootstrap (Henseler et al., 2009) procedure can be used in PLS sampling paths to provide confidence intervals for all estimates. parameters, build a basis for statistical inference. The Bootstrap pattern is created by randomly drawing instances with replacements from the original samples. PLS estimates the path model for each Bootstrap pattern. The path model coefficients that make up a bootstrap distribution can be considered as an approximation of the sampling distribution.

Finally, we examine the moderate role of firm size by the following process: Testing the moderate role

+ moderator variables affect dependent variables,

+ The product of the moderator variable and the independent terminal affect the dependent variable,

+ Checking the cumulative effect of the moderator and independent variables on the dependent variable.

4. Research results

According to the results of Table 1 All 38 scales were tested for reliability through Cronbach's Alpha coefficient and total variable correlation.

Table 1
Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Customer Linkage	0.898	0.900	0.899	0.640
Internal Linkage	0.918	0.919	0.918	0.693
Performance	0.866	0.868	0.866	0.565
Policy Linkage	0.865	0.878	0.858	0.553
Size	0.907	0.909	0.906	0.659
Supplier Linkage	0.913	0.915	0.913	0.637
Supply chain performance	0.916	0.917	0.916	0.625

All have Cronbach Alpha coefficients> 0.6 and total correlation coefficients> 0.4. Therefore, we continue to test and analyze the EFA discovery factor. Preliminary EFA analysis results with Varimax rotation and Principal Component Analysis extraction show that KMO coefficient = 0.826> 0.50 and Sig. = 0.000, which represents a high level of significance. The observed variables in this analysis have factor load factors from 0.586 to 0.882 (both> 0.5). Thus, after the preliminary EFA analysis results,

there are still 6 concepts as originally proposed with 38 observed variables. Next, we put the data that satisfies the reliability condition of the scale into Smart PLS 3.0 software to perform the next analysis. From the above analysis, the results show that all scales meet the analysis conditions, the total reliability coefficient is> 0.8 which is a very great factor. Next, we test the degree of discrimination with the results shown in Table 2.

Table 2
Discriminant Validity (Fornell-Larcker Criterion)

	Customer Linkage	Internal Linkage	Performance	Policy Linkage	Size	Supplier Linkage	Supply chain
Customer Linkage	0.8						
Internal Linkage	0.177	0.832					
Performance	0.242	0.37	0.751				
Policy Linkage	0.124	0.247	0.209	0.744			
Size	0.123	0.271	0.14	0.255	0.812		
Supplier Linkage	0.292	0.339	0.302	0.278	0.248	0.798	
Supply chain performance	0.309	0.22	0.162	0.36	0.355	0.249	0.791

From the results in Table 2, it is shown that all coefficients are smaller than the diagonal coefficients, proving that the pre-hidden variables satisfy the discriminant values in the research model.

Table 3
R Square

	R Square	R Square Adjusted
Performance	0.382	0.389
Supply chain performance	0.647	0.648

The R-Square coefficient of performance is 0.389, showing that the variables in the model explain 38.9% of the variation in performance. According to Hair et al. (2006), this level of interpretation is average and acceptable. In the research model, we only consider the impact of supply chain management efficiency, which explains nearly 40% is quite amazing. Linking variables in the supply chain explain more than 60% of the variation in supply chain management efficiency, according to Hair et al. (2006), which is very strong. Demonstrating cooperation and linkages in the supply chain explains most of the variation in supply chain management efficiency.

Table 4
F - Square

	Customer Linkage	Internal Linkage	Performance	Policy Linkage	Size	Supplier Linkage	Supply chain performance
Customer Linkage							0.312
Internal Linkage							0.302
Performance							
Policy Linkage							0.201
Size			0.218				
Supplier Linkage							0.268
Supply chain performance			0.306				

The F-square results show that the level of exogenous effect on the endogenous variables is moderate in average> 0.15 (Henseler et al., 2015).

Table 5
Model_Fit

	Saturated Model	Estimated Model
SRMR	0.055	0.062
d_ULS	3.886	4.663
d_G	0.65	0.66
Chi-Square	892.212	899.926
NFI	0.880	0.893

Model fit results show that the research data is suitable for the research model, meaning that the research model explains the variability of the research data. The testing results of research models are as follows:
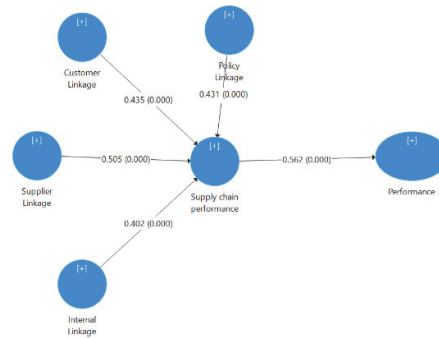

Fig. 2. Test results of research hypotheses

From the result of running Bootstrapping by Two tail technique, the results indicate that all hypotheses H_1, H_2, H_3, H_4 and H_5 are supported. Policy linkages have strong positive impacts on supply chain management efficiency with an impact coefficient of 0.431 at the 1% significance level (P-value = 0.000). This means that if the aluminum bar enterprises in the North are more connected, we need an update on the government's policies on tariffs and the corresponding regime will make supply chain management activities effective. Continuing cooperation with suppliers and customers has a very strong positive impact on the efficiency of supply chain management at a very high impact level of 0.435 and 0.505 respectively at 1% significance level (P -value = 0.000). Through the above results, we recommend that the shaped bar enterprises need to collaborate strongly with suppliers and customers to improve supply chain management performance. When businesses have close links with suppliers, it will reduce inventory pressure and find new sources of raw materials, thereby helping to stabilize production activities and reduce market risks. fierce competition like today. Similarly, if the business has a stable source of customers, the production activities will be established stably according to the production plan, reducing the pressure to find customers and the cost of promoting products. Thereby increasing the efficiency of supply chain management is the premise of operational efficiency. Policies, suppliers and customers are all external links. However, supply chain management activities are mainly performed internally by enterprises, thanks to the smooth coordination between divisions in the business from raw material purchasing department to production, sales and business management. If all are linked to work for a common goal, the performance of the business is never "low" especially supply chain management efficiency. Not deviating from that theoretical flow, the interconnected activities within the shaped aluminum enterprises in the North of Vietnam have positive impacts on the efficiency of supply chain management at a very strong impact level 0.402 at the 1% significance level (P-value = 0.000). Finally, an effective supply chain will have a positive impact on the performance of the business. In aluminum profiles businesses in the North of Vietnam, supply chain management efficiency has a strong impact on business performance with an impact level of 0.562 at 1% significance level (P-value = 0.000). When the supply chain of an enterprise operates effectively, it will positively impact the performance of the business. Obviously, when an enterprise manages its supply chain operations effectively, it will reduce a series of related costs such as finding customers, sourcing raw materials, reducing market risks due to asymmetric information, thereby increasing business performance. We then test the role of the moderator variable and the test results are as follows:
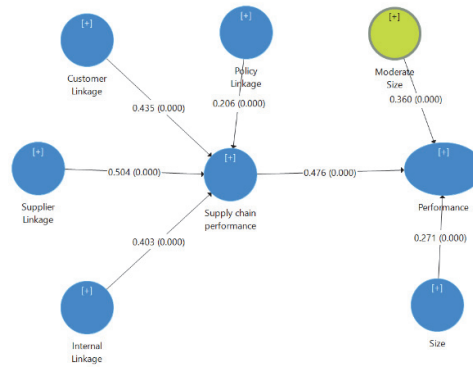
Fig. 3. Results of testing moderate role of Size

When there is a moderate role of firm size, the impact coefficients change. Firm size has a statistically significant moderate role in the relationship between supply chain management efficiency and business performance. The size adjustment variable positively impacts business performance at the impact level of 0.360 at the 1% significance level (P-value = 0.000). We summarize the following research hypotheses:

Table 6
Path Coefficients

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Customer Linkage → Supply chain performance (H2)	0.435	0.434	0.021	20.313	0.000
Internal Linkage → Supply chain performance (H4)	0.403	0.401	0.028	14.472	0.000
Moderate Size → Performance (H6)	0.322	0.322	0.053	3.409	0.000
Policy Linkage → Supply chain performance (H1)	-0.021	-0.021	0.004	5.088	0.000
Size → Performance	0.271	0.269	0.053	5.137	0.000
Supplier Linkage → Supply chain performance (H3)	0.504	0.506	0.034	14.988	0.000
Supply chain performance → Performance (H5)	0.476	0.485	0.061	7.849	0.000

From the results in Table 6, all the research hypotheses are supported, all at 1% significance level (P-value = 0.000). In order to understand the moderate role of scale, we conduct a better analysis based on the facilitation role analysis tool. From the result of the above moderate role, based on the impact coefficient of the moderator variable, we model the role of the moderator variable as follows:
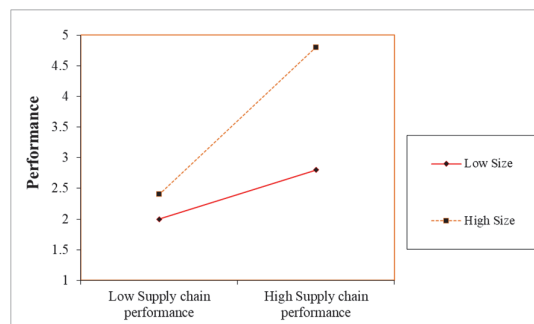

Fig. 4. Moderate role of Size

The results of moderate role modeling show that the larger the aluminum profiles, the higher the supply chain management efficiency, the more effective the business performance is. Since the trading intensity of large enterprises in the supply chain is very high, when these transactions are effectively controlled, the business performance of the enterprises is higher. In addition, the smaller the business, the better management of activities in the supply chain still increases business efficiency, but the impact level is not as strong as large businesses. due to the intensity and extent of these transactions are less

and smaller than large businesses. In the graph in Fig. 4, the graph represents the scale of the impact of scale in large enterprises with a larger slope (slope) than that of small businesses.

5. Solutions to enhance the linkage in the supply chain of aluminum profiles enterprises

Firstly, enhance the creditworthiness: Branding, improving the reputation of enterprises. Accordingly, for wholesale enterprises, it is necessary to choose a separate product line or a private brand with high quality in shaped aluminum products for long-term distribution, building the image of an enterprise with a private label as a product distributor. For retail businesses, it is necessary to build a brand through the selection of quality products and services, to ensure timely delivery, type and quality, on time payment, diverse payment methods, etc.

Second, strengthening the power of enterprises: Strengthening the power of enterprises will enhance the position of the enterprises with partners that will create cooperation voluntarily, or create pressure to force partners to cooperation with enterprises. Accordingly, enterprises need to improve their financial capacity through investment cooperation, calling for capital contribution. To do this, businesses need to have a clear business strategy, ensuring feasibility in the direction of expanding the scale, improving the level of supply, expanding fields, diversifying industries, etc. increasing investment in upgrading modern machinery and technology to increase the value of supplied products, improve productivity in business activities of enterprises.

Thirdly, consolidating relationships with partners: Enterprises need to establish long-term, regular relationships with major suppliers and distributors: Proactively seek and select reputable manufacturers and suppliers to establish long-term cooperative relations. Avoiding intermediaries will increase costs and inefficiency in business. Establishing a wide distribution network, having policies to support exhibiting, discounting and discounting for partners since enterprises need to build and strengthen, create a strong, customer-oriented culture. To create this culture, enterprises need to build philosophy, orientation, core values in business. Develop standards, regulations and principles in cooperation with partners. This makes the cooperation clear and consistent from the beginning with partners. Create trust and engage with partners. Select partners with a culture of customer appreciation. This makes the cooperation more closely between supply chain partners.

6. Recommendations

In order for the supply chain of aluminum profiles enterprises to cooperate better, the authors have some recommendations as follows:

- The Government provides support policies for enterprises such as: Using the State's financial instruments (interest rates, currencies) to lower interest rates and get preferential interest rates, supporting credit policies.

- Associations need to improve their reputation, create charisma and become a forum to connect NOW. Associations need to update information about market trends, industries of Vietnam and the world to provide useful information for enterprises.

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