

Factors affecting the firms' knowledge acquisition in the supply chain in Vietnam: The case of Petrolimex lubricant supply chain

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Abstract

Based on organisational learning theory and knowledge acquisition/sharing theory in the general organisation and in the supply chain, a research model has been established. To optimise the research model under the Vietnamese context, on the one hand, relevant domestic and international research results were inherited, and on the other hand, qualitative research was conducted. In the process of model testing, this study selected the survey objects as the lubricant supply chain, the typical supply chain in Vietnam, in which the Petrolimex lubricant supply chain was chosen as the official representative. 1.329 subjects who are members of the Petrolimex lubricant supply chain at different level (suppliers, manufacturers, distributors, retailers, consumers) were asked for collecting information. The Explore Factor Analysis (EFA) technique, the reliability analysis Cronbach's Alpha, the correlation analysis, and the multivariate regression were conducted to analyse the collected data. The analysed results show that, except for two factors (Joint Participation, Formal goals and plans), the remaining factors in the proposed research model have a causal relationship with knowledge acquisition in the supply chain. Research also demonstrates that there are discrepancy and consistency in knowledge acquisition between a learning organisation and a member of the supply chain. Hence, the meaning of management for the supply chain is to find appropriate solutions to enhance the knowledge acquisition ability of chain members, towards enhancing competitiveness in the market.

Keywords: Knowledge-based management, supply chain, organisational learning, knowledge acquisition

1. Introduction

Knowledge sharing and acquisition have crucial meaning for each organisation in general and members of the supply chain. According to Grant [1], knowledge is considered as the most important strategic resources to survive and succeed so firms must constantly expand and improve their knowledge which is depended on internal knowledge sources as well as the ability to integrate external knowledge. Grant and Baden-Fuller [2] also emphasized that knowledge can be externally integrated through cooperation with others. Although sharing information and knowledge is difficult to measure, it has a good effect in strengthening cooperative relationships, supporting disadvantaged enterprises to alliances, improving competitiveness in the market, and aiding the flow of materials in the supply chain circulate at a faster rate, and saving costs [3], [4], [5]. To enhance knowledge sharing and acquisition among enterprises in the supply chain, it is necessary to find out factors affecting knowledge acquisition between enterprises. There has been a lot of domestic and international research related to knowledge acquisition in the supply chain; however, there are still many research gaps. Firstly, members in the supply chain both acquire knowledge as a learning organisation and as firms which have

close relationships and cooperation with each other. However, the conducted researches have only biased towards enterprises as a learning organisation in general or enterprises in the supply chain in particular, thus they are not complete and comprehensive. Secondly, previous studies on knowledge acquisition of both types mentioned above were mainly conducted under the conditions of developed countries or in joint venture enterprises with foreign partners in developed countries [1], [6], [7], [8], [9], [10], [11]; however, the supply chains in Vietnam are supply chains in a developing country. Thirdly, the differences between Vietnam's business environment and the global business environment can lead to various levels of factors' impact on knowledge acquisition, hence the demanding of practical researches for verifying is urgent. From the reasons above, this study aims to find the answers to overcome the above gaps, aid managers find the solutions to enhance their ability in acquiring knowledge as well as improve the business performance of the supply chain.

2. Literature Review

A. Organisational learning

According to Argyris and Schön [12], organisational learning is the process by which a business responds to changes in both the internal and external environment by detecting the flaws and then correcting them to maintain those organisation's characteristics. Senge [13] defined organisational learning is the basic movement of perception, which promotes environmental awareness differently, and recognises that corporate actions create both problems and solutions. Huber [14] stated learning can be understood as the process by which new information is processed by an entity, changing the scope of its potential behaviours and potentially leading to better results. Following this definition, Huber [14] does not distinguish who the learning subject is, be it an individual, a group, an organisation or even an industry or a society. Besides, organisational learning is also defined as the process by which individuals and organisations acquire new knowledge to change their behaviour and perceptions [15], [16], [17], [18]. According to Huber [14], there are four main elements (constructs) that make up organisational learning, they are knowledge acquisition, information distribution, information interpretation, and organisational memory. Each major factor contains additional elements in which, knowledge acquisition consist of the following five additional elements (1) Innate learning – learning when setting up a business; (2) Experiential learning – learning from operational experience; (3) Indirect learning – learning by observing other businesses; (4) Connect – learning by connecting external sources of knowledge to the firm's knowledge; and (5) Finding and recording information.

B. Knowledge and Knowledge acquisition

There are many definitions of knowledge but the definition of Davenport and Prusak [19, p.5] are quite comprehensive and will be used as the mainstream concept in this study. According to Davenport and Prusak [19, p.5], "*Knowledge is the synthesis of experience, value, information-oriented or expert vision and it provides a basis for evaluating and incorporating new information and experiences. Knowledge begins and is applied in the minds of people. In the organisation, knowledge is often not only contained in documents but also inhabits, processes, practices and in the rule*". According to different authors, knowledge is more than information. Information is objective, often in information forms, information can be transmitted without losing meaning. On the contrary, knowledge consists of different factors; it is both soft skills, official documents, and regulations; it is intuitive, elusive, and expressed in language. Therefore, knowledge is information that has passed through the lens of the user Michael [20]. There are many different ways to classify knowledge, such as individual knowledge and collective knowledge, hidden knowledge and clear knowledge, know-what, know-how, and know-why, component knowledge and structural knowledge, personal knowledge and public knowledge, knowledge and understanding. Many studies have confirmed that knowledge is a crucial resource to create added value and maintain a competitive advantage of businesses in the global market [21], [1], [22].

According to organisational learning, Huber [14] and other scholars have recognised that knowledge acquisition is the first stage of the learning process. In this process, it is necessary to share and transfer knowledge of one subject to arise the knowledge reception of another subject. Huber [14, p.90] demonstrated knowledge as "*the process by which knowledge is acquired*". Later studies such as Inkpen [5], Albino, et al. [23], and [24] pointed out knowledge acquisition is the process of accessing and absorbing knowledge via direct or indirect contact or interaction with knowledge sources. The acquired knowledge is not newly created, but only new to the organisation [19]. The acquired knowledge can be implicit, explicit knowledge, or a combination of both. The results of acquiring knowledge from personal participation and interaction with tasks, technologies, resources, and people in a given situation [25], [26], [27], [28]. Individually acquired knowledge but organisations create a context for individuals to acquire that knowledge.

C. Supply chain

There are many definitions of the supply chain were found in the past. The supply chain is the link between enterprises to bring products or services to market [29]. According to Mentzer, et al. [30], the supply chain is a collection of three or more entities (which can be a legal entity or a natural person) or more directly related to the flow of products/services, finance, and information from material suppliers to customers and vice versa while Christopher [31] defined the supply chain is a network of interconnected organisations that create upstream and reverse flows according to different processes and activities, to provide customers with the value crystallised in products and services. On the other hand, the supply chain is one of the most widely adopted forms of alliance cooperation agreements [32]. This is a flexible form of alliance between businesses, not being constrained and rigid in the legal agreements of common contracts in other forms of alliances such as joint venture, partnership R&D, and cross-licensing [33], [34], [29]. According to Lambert, et al. [29], a supply chain consists of a system of entities and the links between those entities. It means a supply chain which is included components such as businesses, organisations, individuals, and the network of relationship between that component. The components in the supply chain included suppliers who are domestic and foreign enterprises providing raw materials, services, and inputs for production. The manufacturer is the consumer of raw materials, products/services of a supplier's system to produce, process, and machine the goods of the chain. The distributor is an enterprise which directly distributes the manufacturer's good to the customer with a huge quantity. To make the supply chain work effectively and sustainably, the supply chain is needed to the managerial organisation, in which the elements of the chain is required to cooperate and share tangible as well as intangible benefits with each other. One of the manifestations of cooperation in the chain is the sharing, learning, and applying each other's experiences and knowledge in the various fields of enterprises of the supply chain.

D. Factor affecting knowledge acquisition

Studies on knowledge acquisition in the organisation

Generally, the studies related to knowledge acquisition of organisation are often developed based on the research model of the organisational learning by [14] which focus on one or more influencing factors. However, this process does not point out the differences between the knowledge that the organisation acquires from individuals within the organisation or from outside, thus less likely to refer to research on knowledge acquisition in the supply chain. The definition of Cohen and Levinthal [35], Lane and Lubatkin [36], Lane, et al. [7], Phan, et al. [9], and other authors have developed and completed the research models about learning, knowledge acquisition from outside to an organisation. Those studies are closer to research on enterprise knowledge acquisition in the supply chain. According to the above authors' research models, factors affecting the external knowledge acquisition of an organisation/enterprise can be divided into 3 groups: (i) Group of factors about the ability to recognise the new external knowledge; (ii) Group of factors about the ability to assimilate new external knowledge; and (iii) Group of factors about the ability to apply new external knowledge.

The group of factors about the ability to recognise the new external knowledge includes the following elements: (1) Relationships and business cooperation [37], [36], [38], [7], [39], [40], [9]; (2) Enterprise investment in training [41], [42], [9]; (3) Trust between partners [7], [43]; (4) Cultural conflict between firms or cultural gap between partners [7], [44]; (5) The knowledge base of the transferor of knowledge [7].

The group of factors about the ability assimilate new external knowledge includes the following elements: (1) Employee learning ability, learning intention [45], [1], [46], [47], [48], [49], [9], [11], [50]; (2) Learning mechanism [51], [11]; (3) Distance, conflict between partners in culture, geography, language [49], [9], [52], [11]; (4) Organisational flexibility and adaptability [53], [7]; (5) Corporate culture [54], [55], [50]; (6) Management participation in training, commitment in training [56], [51], [7], [49], [11]; (7) Sectoral relevance between parties [53].

The group of factors about ability to apply new knowledge outside includes the following elements: (1) the general participation of the staff of knowledge acquisition and transfer [53], [7], [9] and (2) Formal goals and plans [35], [14], [56], [53], [7], [9].

When considering and analysing the above studies, it is shown that many pieces of researches, such as Lane, et al. [7], Phan, et al. [9], Nguyen and Tran [11], Lyles and Barden [51], Tsang, et al. [49], have tested research model on the same subject as the joint venture company in which the knowledge acquisition is all from foreign holding company. Hence, the result of those studies might be incorrect or incomplete when the survey subjects are from various type of supply chain enterprises without the foreign relationship/elements. In detail, there are three major reasons led to above conclusion (1) in the context of joint venture firms, the factor "cultural conflict between firms or cultural gap between partners" is found to be the factor affecting knowledge acquisition. However, this finding is no longer be true in the context of the supply chain because firms in the supply chain

zone are voluntarily interlinked. They have been able to cooperate in business because they have many mutual benefits; (2) in the context of joint venture companies, the factor “*the knowledge of the transferor of knowledge*” is considered to have a positive effect on knowledge acquisition, especially in the context of technology/knowledge transferring from the holding company to subsidiary company. However, in term of the supply chain, on the contrary, the cooperation between members is based on the differences in business lines, supporting and complementing each other on the principle of specialisation and deficient compensation to enhance business efficiency of the whole chain, thus the above finding will not be completely accurate; (3) in the past study, Lane, et al. [7] and Lyles and Salk [53] discovered the elements organisational flexibility and adaptability, formal goals and plans, and specialisation of the role of the partner’s knowledge transferring positively affect the level of knowledge acquisition. However, in their later research, this factor is generally grouped into groups of organisational learning structure and according to the knowledge flow theory, it is not necessary to consider this synthetic factor [9].

Studies on knowledge acquisition in the supply chain

Practically, there are many pieces of research were conducted about the factors affecting knowledge acquisition in the supply chain. Although they are still sporadic and often aimed at other goals and do not consider knowledge acquisition as the main goal, these studies have also found a few factors affecting knowledge acquisition in the supply chain. They can be classified into two groups which are the group of factors related to organisational learning and the group of factors related to partnership in the supply chain.

Regarding the group of factors related to organisational learning, the researches of Spekman, et al. [57] and Hult, et al. [24] confirmed that the relationship between the level of memorisation gained in a supply chain is positively related to the activity level of knowledge acquisition. The level of memorisation here implies that the knowledge, experience and understanding of the past cooperation process positively affect knowledge acquisition in the supply chain. The study of Spekman, et al. [57] also identified the prefixes of the learning process, such as the ability to integrate technology, trust in organisations, sharing information, cooperation process understanding, and giving decision process, which creates a convenient environment for sharing and transferring knowledge to partner, affects to knowledge acquisition. Despite the incomplete and unclear classification, the factors affecting knowledge acquisition discovered by [57] are homogenous and can be classified into the first two groups of factors which are indicated by the researches on knowledge acquisition in an organisation mentioned above (the group of factors about the ability to recognise the new external knowledge and the group of factors about the ability assimilate the new external knowledge).

Regarding the group of factors related to the partnerships in the supply chain, the studies of Spekman, et al. [57], Hult, et al. [24], Dyer and Hatch [58], Krause, et al. [59], Modi and Mabert [60], and Panayides and Venus Lun [61] pointed out a series of specific factors affecting knowledge acquisition of partnerships: trust, commitment, interdependent, sharing, factors of competition pressure, evaluation standard, the quality certificate for suppliers, incentives for business opportunities. These factors, in essence, are compatible and so they can be in “*the group of factors about the ability to recognise the new external knowledge and the group of factors about the ability to assimilate the new external knowledge*”. Besides, the study of Emerson [62], Caniels and Gelderman [63], and He, et al. [64] also found that the factor “*Power and Independence among businesses in the supply chain*” has a direct impact on knowledge acquisition of the chain. This factor includes two elements that have opposite effects on knowledge acquisition, namely “*the availability of alternatives*” (having a negative impact) and “*the limitation of using power*” (having a positive impact).

All in all, the research on knowledge acquisition in the supply chain mentioned above shows that most of the factors affecting the knowledge acquisition that have been found can be classified into two groups of the factors, the group of factors about the ability to recognise the new external knowledge and the group of factors about the ability to assimilate the new external knowledge, respectively. However, there is an element of the partnership, a very specific element of the supply chain that has not been mentioned and has never been classified into the groups of factors mentioned, the element “*Power and Interdependence among the businesses in the supply chain*”.

This factor should be considered as an indispensable element of factors affecting knowledge acquisition in the supply chain, especially when research results on this factor have heterogeneity in various studies, such as the researches were conducted by Beecham and Cordey-Hayes [65], Benton and Maloni [8], Muthusamy [66], He, et al. [64], Cox [67]; Dyer and Nobeoka [68]; Yeung, et al. [69]; Dang [70].

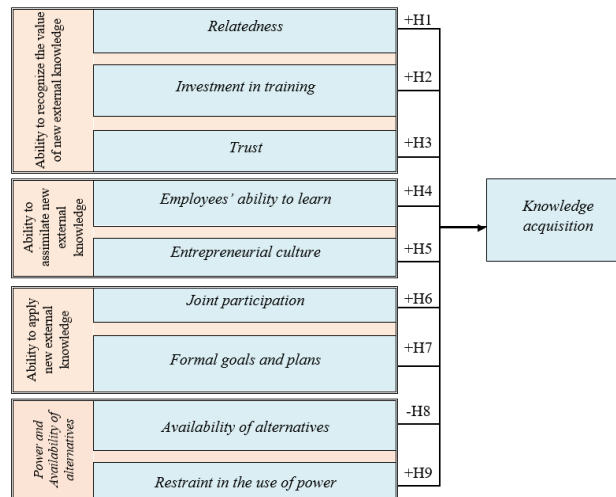
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3. Proposed research model and the research hypothesis

A. Research model

The principles for building a research model in this study include: (1) Based on the knowledge acquisition theory in the organisation in general and in the supply chain in particular (2) Selective inheritance experimental research results have been published in the direction of overcoming existing research limitations/gaps and (3) Maximum application to specific circumstances taking into account the characteristics of the supply chain that are common in Vietnam, especially the lubricant supply chain. With the above-mentioned principles, the proposed research model (Figure 3.1) is made up of 4 factors with a total of 9 sub-factors as independent variables and dependent factor is Knowledge acquisition.

Figure 3.1: Proposed research model



B. Research hypothesis

This study came up with 9 hypotheses to analyse the relationships/effects of independent variables and dependent variables.

- Studies by Phan, et al. [9], Hanvanich, et al. [40], Inkpen and Tsang [39], and Lane, et al. [7] showed that the relationship between Relatedness and knowledge acquisition is statistically meaningful. Therefore, the hypothesis H1: *The Relatedness positively impacts knowledge acquisition.*

- Nguyen and Tran [11], Lyles and Barden [51], Tsang, et al. [49], Mohammad and Juhana [71], and Spekman, et al. [57] demonstrated that the relationship between the Investment in training and the acquisition of knowledge is statistically meaningful. Therefore, the hypothesis H2: *The Investment in training positively affects the acquisition of knowledge.*

- Phan, et al. [9], Inkpen and Currall [43], Lane, et al. [7], Spekman, et al. [57], Modi and Mabert [60], Panayides and Venus Lun [61], and Truong [50] affirmed that the relationship between Trust and knowledge perception is statistically meaningful. Therefore, the hypothesis H3: *The Trust among partners positively impacts knowledge acquisition.*

- Zahra and George [46] and Phan, et al. [9] pointed out that the relationship between the Employee's ability to learn and the acquisition of knowledge is statistically meaningful. Therefore, the hypothesis H4: *The Employees' ability to learn positively impacts knowledge acquisition.*

- Hatch [54], Lee and Peterson [55], and Lai and Lee [72] found that if the Entrepreneurial culture is strong, the acquisition of knowledge takes place more and better. Therefore, the hypothesis H5: *The Entrepreneurial culture positively impacts knowledge acquisition.*

- Phan, et al. [9] demonstrated that the Joint participation of employees has a positive impact on the level of knowledge acquisition in the supply chain enterprises. Therefore, the hypothesis H6: *Joint participation positively impacts knowledge acquisition.*

- Lyles and Salk [53] clearly outlined that Formal goals and plans can affect knowledge acquisition in supply chain businesses. Therefore, the hypothesis H7: *The Formal goals and plans have a positive impact on knowledge acquisition.*

- Albino, et al. [23] presented that the Availability of alternatives will likely limit the exchange of knowledge to protect their core values or to keep their place in the market so that their valuable knowledge will not reach their stressed partners [65]. There is another view that the weak party will be suspicious and fearful of the intentions of the stronger party in the partnership, they can resist stronger partners to protect their knowledge assets [73]. Therefore, the hypothesis H8: *The availability of alternative partners has a negative effect the knowledge acquisition.*

- Benton and Maloni [8], Beecham and Cordey-Hayes [65], He, et al. [64] said that restraint in the use of power will enhance knowledge sharing among supply chain partners. Therefore, the hypothesis H9: *The Restraint in the use of power has a positive effect the knowledge acquisition.*

4. Research methods

A. Measuring variables

The independent variables and the dependent variables are inherited from previous studies and adjusted to suit the supply chain research conditions in the supply chain based on qualitative research result (expert interview). The Likert scale of 5 levels from 1= completely disagrees to 5 = fully agreed to be used to measure variables. The categories/criteria measuring variables is in Table 1.

Table 1: Measuring item and scale of concepts

Symbol	Concept	Measuring item number	Source
KAF	<i>Knowledge acquisition</i>	5	Hult, et al. [24]
RLF	<i>Relatedness</i>	5	Lyles and Barden [51]
ITF	<i>Investment in training</i>	4	Cao [74]
TRF	<i>Trust</i>	4	Lane, et al. [7]
EALF	<i>Employees' ability to learn</i>	5	Phan, et al. [9]
ECF	<i>Entrepreneurial culture</i>	6	Truong [50]
JPF	<i>Joint participation</i>	3	Lyles and Salk [53]
FGPF	<i>Formal goals and plans</i>	2	Lyles and Salk [53]
AAF	<i>Availability of alternatives</i>	6	He, et al. [64]
RUPF	<i>Restraint in the use of power</i>	3	He, et al. [64]

B. Research sample and data collection

This study selects the survey subject/research sample, which is a typical supply chain in Vietnam, is the lubricant supply chain with a single lead company - Petrolimex. This is a typical supply chain because its type is not inclined to R&D and is popular in Vietnam. The firm analysis in the supply chain by a single focal firm

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avoids the confounding effects of firms operating in different supply chains [24] and has been demonstrated in the study of Hallikas, et al. [75] and He, et al. [64]. Participants in the sample are the suppliers and distributors of the Petrolimex lubricant supply chain. The direct respondent is member business leaders or unit heads participating directly in this supply chain.

The questionnaire is designed based on previous studies. The original English questions were translated into Vietnamese. To ensure uniformity in interpretation, the questionnaire will be translated back into English. These questions are also adjusted and supplemented to suit the business conditions in the supply chain in Vietnam according to the results obtained from qualitative research (conducted by the authors) before issuing. The final Vietnamese version of the questionnaire has been tested by several participants who are members of the lubricant supply chain in the sample to minimise errors.

In the questionnaire, there are 43 variables. Therefore, for at least 5 observations per variable, the minimum sample size should be $43 * 5 = 215$ observations [76]. To enhance the quality of the research, over 3,000 questionnaires were distributed (including 670 online and 2,340 paper questionnaires). As a result, 1,378 valid questionnaires were analysed. The sample profile is as follows: (1) About the ingredients in the supply chain: 7.1% are the supplier, 0.9% are producers, 29.1% are distributors, 48.7% are retailers, 16.2% are users (2) Regarding the types of businesses: 29% are state-owned, 20.8% is joint-stock, 34.2% are limited liability companies, 9.8% are private companies and 6.3% are other businesses; for revenue: from 10 to 50 billion VND with 9.7% of enterprises, from 50 to 100 billion VND, there are 8.7% of enterprises, with over 100 billion VND there are 61.1% of businesses and 21.1% of businesses are not under Petrolimex control, 79.8% of businesses are Petrolimex.

C. Reliability test, hypotheses test, and model validation

Reliability test

For the first attempt of exploratory factor analysis (EFA), the results are: $KMO = 0.802 > 0.5$ and Sig. (Barlett's Test) = 0.000 <0.05; Factor Loadings > 0.5; Eigenvalues = 1,112 > 1; Total variance extracted (Cumulative%) = 65,896% > 50%. 38 independent variables were grouped into 8 factors, of which the 8 variables had Factor Loading coefficient <0.5, so it was excluded from the EFA analysis. Analysis results for the second time: $KMO = 0.918 > 0.5$ and Sig. (Barlett's Test) = 0.000 <0.05; Eigenvalues = 1,106 > 1; Total variance extracted = 73.985% > 50%. 30 independent variables are grouped into 6 factors by the method of rotating the factor axis varimax. All variables have Factor Loading coefficient > 0.5. The measurement items and scales are reliable, Cronbach's Alpha coefficients are in the range of 0.8-0.9 (Table 2). Therefore, it is assumed that the reliability condition is satisfied for further tests.

Table 2. Cronbach's Alpha coefficient test result

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ECF, $\alpha=0,813$				
ECF1	26,84	17,788	0,681	0,796
ECF2	26,62	17,567	0,656	0,798
ECF3	27,03	17,808	0,510	0,713
ECF4	26,86	18,189	0,670	0,797
ECF5	26,51	17,770	0,659	0,798
ITF4	26,75	18,589	0,551	0,807
TRF4	26,73	18,526	0,598	0,803
EALF, $\alpha=0,824$				
EALF1	28,85	28,333	0,634	0,814

2	EALF	28,78	28,426	0,694	0,812
3	EALF	28,82	28,343	0,672	0,812
4	EALF	28,79	28,259	0,721	0,810
AAF, $\alpha=0,871$					
	AAF1	17,34	11,994	0,606	0,862
	AAF2	17,08	12,513	0,626	0,856
	AAF3	17,54	12,147	0,657	0,851
	AAF4	17,60	11,369	0,736	0,837
	AAF5	17,56	11,724	0,709	0,842
	AAF6	17,14	12,653	0,715	0,844
RUPF, $\alpha=0,849$					
1	RUPF	15,75	3,845	0,733	0,798
2	RUPF	15,61	3,860	0,761	0,792
3	RUPF	15,74	3,831	0,594	0,841
	JPF2	15,74	3,958	0,706	0,806
ITF, $\alpha=0,9$					
	ITF1	10,12	5,958	0,835	0,850
	ITF2	10,13	6,161	0,830	0,853
	ITF3	10,25	6,148	0,829	0,853
	ITF4	10,16	6,814	0,629	0,824
RLF, $\alpha=0,868$					
	RLF3	14,48	8,028	0,702	0,837
	RLF1	14,33	7,895	0,755	0,823
	RLF2	14,17	8,606	0,737	0,830
	RLF4	14,24	8,427	0,685	0,841
	RLF5	14,29	8,894	0,584	0,865

Hypotheses test

The study used Pearson's coefficients to analyse the correlation between the independent variables and the dependent variable. Correlation coefficient values are in the range from 0.231 to 0.673. Therefore, the relationship between the variables is significant and shows no signs of anomalies, can continue to use other statistics to test this relationship. Correlation test of the variables all have significance = 0.000 < 0.05, so the variables are correlated with each other and have statistical significance. The dependent variable has a positive correlation with independent variables, the correlation coefficient (Pearson Correlation) is mostly quite high, the most strongly correlated variable is ECF (0.673), the weakest correlation is the variable JPF (0.231).

Model validation

The model results have good quality with $R^2 = 0.641$, Durbin-Watson = 1,957, $F = 393,190$ with

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significance level Sig. <0.000. The variables have the Tolerance value > 0.0001 and the multicollinearity test with the VIF coefficients are all very small from 1,583 to 2,999 <10, showing the multicollinearity of the independent variables is negligible and is accepted in the regression model. Factors JPF and FGPF have not been accepted because the significant value is 0.171 and 0.426 > 0.05, respectively. The remaining 6 factors are accepted and the level of impact on dependant factor is calculated as shown in Table 3.

Table 3. Regression analysis result

Coefficients ^a							
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	,264	,093		2,841	,005		
ECF	,422	,027	,384	15,437	,000	,439	2,280
EALF	-,060	,029	-,058	-,2040	,042	,333	2,999
AAF	-,169	,020	-,175	-,8429	,000	,632	1,583
RUPF	,209	,027	,166	7,745	,000	,591	1,691
ITF	,266	,017	,349	15,676	,000	,548	1,826
RLF	,233	,022	,248	10,483	,000	,484	2,066
a. Dependent Variable: KAF							

5. Discussion and managerial recommendation

Among the 9 initial hypotheses about the factors that can affect the knowledge acquisition (KAF), there are 6 accepted factors, explaining 66.1% of the variation of knowledge acquisition. The factors, such as Relatedness (RLF), Investment in Training (ITF), Employee's Ability to Learn (EALF), Entrepreneurial Culture (ECF), Availability of Alternatives (AAF), and Restraint in Use of Power (RUPF), are accepted in the research model with standardised regression weights respectively 0.248, 0.349, -0.058, 0.384, -0.175, and 0.166. An important point is that the factors of the internal organisation account for the majority because knowledge acquisition is only conducted when the organisation recognises that it is necessary. External factors, which are interdependent relationships, can only affect knowledge acquisition when the enterprise has the need and want to acquire knowledge. The result of this study supports the research of He, et al. [64]. The RUP factor in the supply chain has a positive impact on knowledge acquisition, while the more AAF the harder it is for knowledge to be exchanged and received. However, the result of research does not accept some factors as JPF and FGPF, which have been confirmed to have an impact on the joint venture business environment [9]. In the Petrolimex lubricant supply chain, although the level is small there is a reversal of the impact of the EALF factors compared with the previous studies. This circumstance has been explained in the qualitative research conducted by our author's group. In particular, some distributors said that it is difficult for retailers to absorb knowledge from the partners in the upper classes, but they feel easy to exchange, share, and acquire knowledge from each other because they have similar competencies, experience, and knowledge background. The survey also shows the vertical knowledge acquisition of the chain. In the lubricant supply chain, there is a huge difference in the ability to learn of enterprises among different classes/groups, negative affecting the knowledge acquisition of enterprises in the chain.

The findings from this research allow some suggestions for enhancing knowledge acquisition in the supply chain. Firstly, enterprises should have the policy and commitment to training resources, especially for central business in the supply chain. The resources committed for training should focus on training, providing clear, socialised knowledge to new supply chain participants. Manufacturers only need to invest more according to the characteristics of the industry to improve the general knowledge of the whole supply chain. On the other hand, in each enterprise, creating conditions for each employee to learn and gain knowledge from partners should be presented by the policy. Secondly, enterprises should strengthen the exchange and cooperation in many fields with the partners in the supply chain to create a favourable environment for learning and transferring knowledge. Thirdly, enterprises should enrich forms of knowledge sharing among members of the supply chain to suit the characteristics of each industry. The expertise of each member in each class is different so it is not necessary to share in-depth knowledge among classes. There should be many forms of transferring and acquiring knowledge in the chain. For the areas of expertise and high technology toward R&D, knowledge transfer specialist must come from large upstream enterprises and they are in charge of guiding downstream enterprises. On the contrary, the skills and knowledge that are not too complex but necessary to participate effectively in the supply chain, the specialist from partners in the same class of the supply chain will transfer more effectively.

6. Limitations and Future Research

This study has given a general model of the factors affecting knowledge acquisition in the supply chain and found out the factors as well as the level of influence on knowledge acquisition of firms in the Petrolimex lubricant supply chain. Besides the achieved results, there are some limitations and directions to overcome these limitations which are suggestions for future research. Firstly, it is necessary to develop quantitative research samples that are more universal or from the supply chains where the central member is not necessarily the manufacturer. Secondly, it is necessary to develop and research the measurement items of the independent factors as Joint Participation factor (JPF) and Formal Goals and Plans factor (FGPF) to perform the test by Cronbach' Alpha. Thirdly, it is necessary to have more in-depth analytical studies to identify the difference in demographic factors in research result. Fourthly, it is necessary to have more studies linking the knowledge acquisition ability among members of the supply chain with the firm performance and supply chain in general.

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