

Uncertain Supply Chain Management

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Investigating the effect of value chain on knowledge application for economic development

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CHRONICLE

Article history:

Received July 18, 2014
Accepted December 18 2014
Available online
December 23 2014

Keywords:

Knowledge Economy Index (KEI)
Knowledge Index (KI)
Value chain performance
Organization of Islamic
cooperation

ABSTRACT

A value chain is a chain of necessary activities that a company operating in a specific industry executes in order to deliver a valuable product or service for the market. Value chain plays essential role for development of a successful business unit. This paper presents an empirical investigation to study the effects of value chain on capabilities of knowledge production, implementation and distribution. The impact is also studied for effective knowledge implementation for economic development. Using historical economic data of World Bank database gathered from member countries of the Organization of Islamic Cooperation, the study has detected positive and meaningful effects of Value Chain Presence on Knowledge Economy Index and Knowledge Index.

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1. Introduction

A value chain is a chain of necessary activities that a company operating in a specific industry executes in order to deliver a valuable product or service for the market. Value chain plays essential role for development of a successful business unit (Porter, 2008a). The idea of value chains as decision support tools, was contributed into the competitive strategies paradigm was originally developed by Porter (1979). According to Porter's value chains, Inbound Logistics, Operations, Outbound Logistics, Marketing and Sales and Service are considered as primary activities. Other activities such as Procurement, Human Resource management, Technological Development and Infrastructure are considered as secondary activities (Porter, 2008b). Business unit is normally considered as the suitable level for building a value chain. Products circulate through various activities of a chain in order, and at each activity the product receives some value. The chain of activities provides the products with more added value than the sum of added values of all other activities (Porter, 2008a). Fig. 1 demonstrates Porter's value chain consists of primary and supportive activities as follows,

Inbound Logistics: This includes arranging the inbound movement of materials, parts, and/or finished inventory from various suppliers to production or assembly plants, warehouses, or retail stores

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Operations: This item is associated with management of the process, which converts inputs such as raw materials, energy, etc. into final products.

Outbound Logistics: This is associated with the storage and movement of the final good and information flows from the end of the production line to the end user.

Marketing and Sales: This item is associated with selling a product or service and processes for building, communicating, delivering, and exchanging offerings, which have value for customers, clients, etc.

Service: This includes all necessary activities needed to maintain the product/service working effectively for the buyer after it is offered to customers.

In addition, the secondary activities are associated with the following items,

Procurement: The acquisition of products, services or works from an outside external source,

Technological Development: This is associated with the equipment, hardware, software, procedures and technical knowledge transferred to the firm's transformation of inputs into outputs.

Human resources management: This includes all necessary activities integrated in recruiting, hiring, training, developing, compensating of employees.

Infrastructure: This consists of activities such as accounting, legal, finance, control, etc.

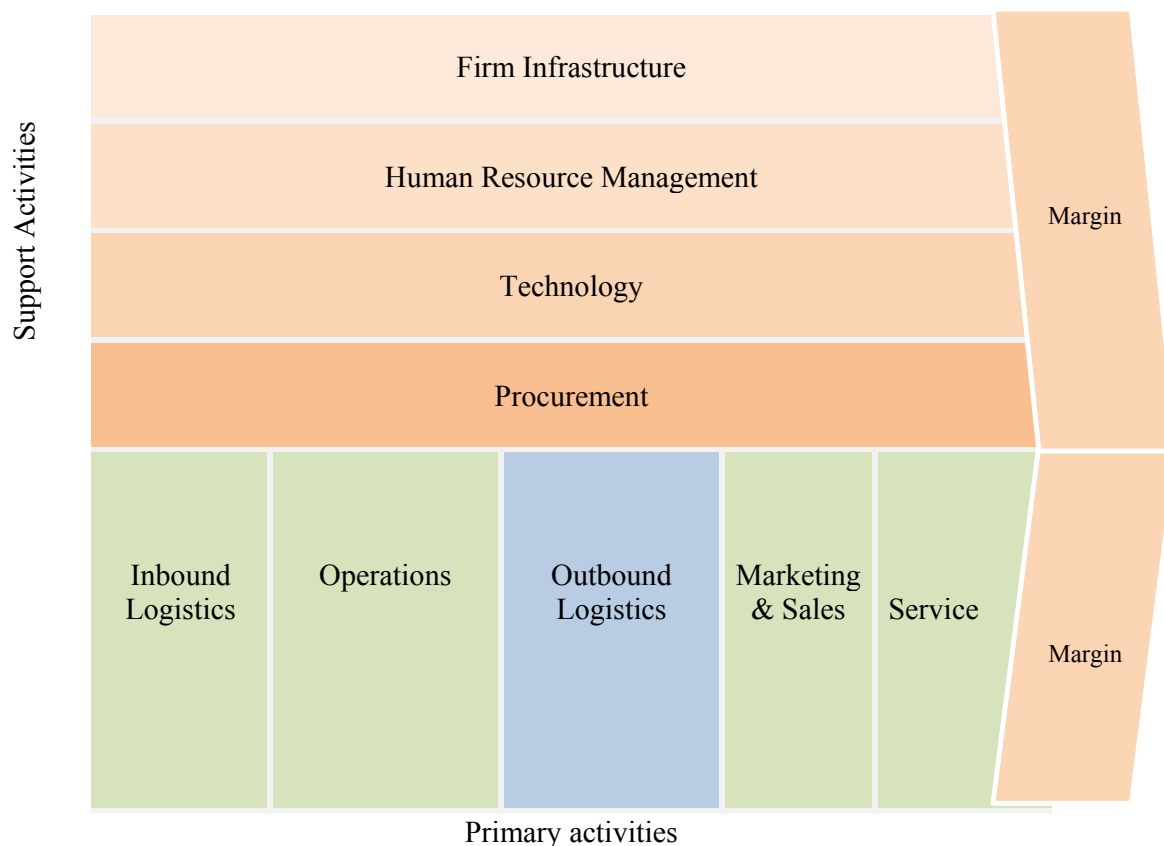


Fig. 1. Michael Porter's value chain

During the past few years, there have been growing concerns on learning more about the effects of value chain on economy. Morrison et al. (2008) presented a review of the global value chain (GVC) literature in light of the “technological capabilities” technique to innovation in less-developed countries (LDCs). Participation in GVC is considered as an advantage for companies in LDCs, which are bound to source technology. They proposed a shift in the empirical and theoretical agenda, discussing that study ought to integrate the analysis of the endogenous process of technological capability development, and of the mechanisms helping knowledge flow within and between various global value chains into the GVC literature.

Akram et al. (2011) investigated the linkage between knowledge management process and innovation process to shed light on the important relationships and flows of activities. By studying different empirical and conceptual studies, they found that various components of Knowledge Management such as Knowledge activities, transformation of knowledge and technology had positive impact in bringing innovation through transformation of knowledge into knowledge assets in firms.

Reddy (2014) built a framework to describe the relative importance of Innovation in business value chains. The study drew on three streams of literature – need, significance and developing innovation capabilities to determine three important components, which contribute a bigger role on how value chains could be directed and changed to the Innovation process in business world. Reddy highlighted the concept of value and its progress as value chain and concentrated on the necessity and importance of value chain triggered by innovation. Alnawaiseh et al. (2014) investigated the extent of using value chain analysis to reach and sustain competitive advantage in Jordanian manufacturing firms.

According to Mustapha and Abdullah (2004), the emergence of a knowledge-based economy has spawned a “new” notion of workplace literacy. The traditional covenant where employees anticipate a stable or lifelong employment may no longer apply. They reported that employers prefer certain kinds of entry-level competencies of the prospective employees and provided an overview of workplace literacy from the perspective of the employers regarding Malaysia's transition toward a knowledge-based economy. Bajzikova et al. (2014) dealt with the findings associated with the implementation of the organizational innovations as well as barriers impairing their adoption and motivators enhancing their introduction. Mortazavi and Bahrami (2012) investigated entrepreneurship and defined knowledge-based economy and its prerequisites and consequences. They collected the success criteria and important role of knowledge in this new economy in terms of various sources. They also presented a conceptual-compiling model, derived from different characteristics in development and growth of knowledge-based economy and entrepreneurship and called it knowledge-based entrepreneurship. The model emphasized on the synergy of these two mentioned concepts in order to reach competitive advantages such as high efficiency, optimal use of knowledge and human capital, and making fundamental changes in the entrepreneurial organization.

Al Shami et al. (2014) proposed a new framework for predicting knowledge based economy (KBE) competitiveness. They used existing KBE indicators from internationally recognised organisations to forecast and unify the KBE performance indices. They used three various predicting techniques including time-series cross sectional, linear multiple regression, and artificial neural network (ANN) where ANN forecasting techniques outperformed the other techniques. de la Paz-Marín et al. (2015) proposed a method for classification of countries' progress toward a Knowledge Economy based on machine learning classification techniques. According to Fucec and Corina (2014), knowledge economies represent a high-debated issue among many researchers because of the context of reaching sustainability and putting an end to the economic crisis. To find out more about how far away from being a knowledge economy each country was, Fucec and Corina (2014) looked closely at the Europe 2020 Strategy using Principal Components Analysis. The analysis was executed on the 27 European Union countries plus Switzerland, Norway and Iceland and the level they had registered for each of the

8 indicators of the Europe 2020's in 2010. They presented some basic quantitative results from the cluster analysis, which helps point exactly the position of Romania in the wide European context. The research provided quantitative results and could be observed as an information instrument for those interested in seeing where Romania stands and where it was heading, based on relevant information and on an accurate analysis.

2. The proposed study

This paper presents an empirical investigation to study the effects of value chain on capabilities of knowledge production, implementation and distribution. The impact is also studied for effective knowledge implementation for economic development. The study has accomplished among member countries of the Organization of Islamic Cooperation. The Organization of Islamic Cooperation established in 1969 has 57 members, 56 of which are also member states of the United Nations. This study collects the historical economic data from World Bank database gathered for member countries of the OIC and uses some statistical tests to study the effects of value chain presence (VCHP) on knowledge economy index (KEI) and knowledge index (KI). In this study, dependent variables are KEI and KI and VCHP is the independent variable. Next, we present the results of the study.

3. The results

In this section, we present details of the implementation of regression analysis. We first present the effect of value chain presence on knowledge economy index in Table 1 as follows,

Table 1

The summary of regression analysis between VCHP and KEI

Model 1	Non-standard coefficients		Standard coefficients	t	Sig.
	β	Standard error	β		
(Constant)	1.914	.502		3.813	.001
VCHP	.513	.111	.686	4.617	.000

Adj. R-Square = 0.448 Durbin-Watson = 1.775 F-value = 21.317 P-Value = 0.000

As we can observe from the results of regression analysis, F-value is equal to 21.317 with Sig. = 0.000, which means the relationship between independent variable and dependent variable is linear. In addition, Durbin-Watson value is equal to 1.775, which means there was no correlation among residuals. Moreover, Adjusted R-Square indicates that independent variable could approximately describe 45% of the change on dependent variable. Finally, t-student values are statistically significant. According to our results, an increase of one unit in value chain presence (VCHP) may increase 0.513 unit in knowledge economy index (KEI).

We have also studied the effect of value chain presence on knowledge index and Table 2 presents the results of our survey as follows,

Table 2

The summary of regression analysis between VCHP and KI

Model 2	Non-standard coefficients		Standard coefficients	t	Sig.
	β	Standard error	β		
(Constant)	1.914	.589		3.285	.003
VCHP	.517	.129	.633	4.009	.001

Adj. R-Square = 0.376 Durbin-Watson = 1.888 F-value = 16.059 P-Value = 0.000

As we can observe from the results of regression analysis, F-value is equal to 16.059 with Sig. = 0.000, which means the relationship between independent variable and dependent variable is linear. In

addition, Durbin-Watson value is equal to 1.888, which means there was no correlation among residuals. Moreover, Adjusted R-Square indicates that independent variable could approximately describe 38% of the change on dependent variable. Finally, t-student values are statistically significant. According to our results, an increase of one unit in value chain presence (VCHP) may increase 0.517 unit in knowledge index (KI).

4. Conclusion

In this paper, we have presented an empirical investigation to study the impacts of value chain presence on Knowledge Economy Index and knowledge index. The study has accomplished on data collected from OIC countries and the results have indicated that value chain presence positively influenced on knowledge economy index and knowledge index when the level of significance was five percent. The results of this study are in line with other similar studies accomplished recently (Foray & Lundvall, 1998; Malmberg & Maskell, 2002; Alnawaiseh et al., 2014; Akram et al., 2011; Bajzikova et al., 2014).

Acknowledgement

The authors would like to thank the anonymous referees for constructive comments on earlier version of this paper.

References

- Akram, K., Siddiqui, S. H., Nawaz, M. A., Ghauri, T. A., & Cheema, A. K. H. (2011). Role of knowledge management to bring innovation: an integrated approach. *Cell*, 92(333), 6183035.
- Alnawaiseh, M. A. L. I., AL-Rawashdi, F. M., & Alnawaiseh, M. (2014). The extent of applying value chain analysis to achieve and sustain competitive advantage in Jordanian manufacturing companies. *International Business Research*, 7(8), 179-188.
- Bajzikova, L., Sajgalikova, H., Wojcak, E., & Polakova, M. (2014). Dynamics of changes toward knowledge-based economy in Slovak SMEs. *Procedia-Social and Behavioral Sciences*, 150, 637-647.
- Foray, D., & Lundvall, B. (1998). The knowledge-based economy: from the economics of knowledge to the learning economy. *The economic impact of knowledge*, 115-121.
- Fucec, A. A., & Corina, M. P. (2014). Knowledge Economies in the European Union: Romania's Position. *Procedia Economics and Finance*, 15, 481-489.
- Malmberg, A., & Maskell, P. (2002). The elusive concept of localization economies: towards a knowledge-based theory of spatial clustering. *Environment and planning A*, 34(3), 429-450.
- Mortazavi, S. H., & Bahrami, M. (2012). Integrated approach to entrepreneurship-knowledge based economy: A Conceptual Model. *Procedia-Social and Behavioral Sciences*, 41, 281-287.
- Morrison, A., Pietrobelli, C., & Rabellotti, R. (2008). Global value chains and technological capabilities: a framework to study learning and innovation in developing countries. *Oxford Development Studies*, 36(1), 39-58.
- Mustapha, R., & Abdullah, A. (2004). Malaysia transitions toward a knowledge-based economy. *Journal of Technology Studies*, 30(3), 51-61.
- de la Paz-Marín, M., Gutiérrez, P. A., & Hervás-Martínez, C. (2015). Classification of countries' progress toward a Knowledge Economy based on machine learning classification techniques. *Expert Systems with Applications*, 42(1), 562-572.
- Porter, M. E. (1979). *How competitive forces shape strategy* (pp. 21-38). Boston: Harvard Business Review.
- Porter, M. E. (2008a). *Competitive advantage: Creating and sustaining superior performance*. Simon and Schuster.
- Porter, M. E. (2008b). The five competitive forces that shape strategy. *Harvard business review*, 86(1), 25-40.

- Reddy, G. P. (2014). Significance of innovation in business process of value chain. *Journal of Behavioural Economics, Finance, Entrepreneurship, Accounting and Transport*, 2(1), 18-25.
- Al Shami, A., Lotfi, A., Coleman, S., & Dostál, P. (2014). Unified knowledge based economy hybrid forecasting. *Technological Forecasting and Social Change*. doi:10.1016/j.techfore.2014.01.014