

Supply Chain Management Issue : Development Science Techno Park (STP) Through Small, Medium Enterprises (SMEs), Case Study of Puspipstek Serpong Indonesia

Fadoli¹, Sam'un Jaja Raharja², Margo Purnomo³, Lina Auliana⁴
^{1,2,3,4}Business Administration Departement, Padjadjaran University, Bandung
1fadoli16001@unpad.ac.id
2s.raharja2017@unpad.ac.id; harja_63@yahoo.com
3purnomo@unpad.ac.id
4lina.auliana@unpad.ac.id

Abstract--- In the era of globalization where all industries must transform and make changes in order to survive sustainably, scientific studies are conducted to test how much influence innovation, Research & Development (R&D) and E-Commerce have on the performance of Small and Medium Enterprises (SMEs) at Puspipstek Serpong in the perspective of Supply Chain Management (SCM). Grand Theory used in writing this article is "Resource Base View" by Edith Penrose. These four variables examined using the quantitative method and creation of this article were tested using the Smart PLS program version 3.2.8. The results of the Smart PLS calculation showed that innovation and e-commerce variables significantly affected the SMEs business performance variable both directly and indirectly. For R&D variable, it does not significant direct effected the SMEs business performance variable, but will significantly affected by innovation variable.

Keywords--- Innovation, SCM, R&D, E-Commerce, SMEs
JEL Codes--- H5, H6, H3, H4

1. Introduction

Small and Medium Industries commonly known as Small and Medium Enterprises (SMEs) have a significant important role in promoting economic growth in many countries [1] both in terms of employment and economic growth and growth [2]. In today's increasingly globalized economy, SMEs are now considered the main source of dynamism, innovation and flexibility in developing countries. They contribute greatly to economic development and job creation [3].

SMEs has a strategic role in national economic development. SMEs play a role in economic growth and employment. In addition, SMEs also play a role in the distribution of development outcomes. The existence of the SME sector is not only considered a temporary shelter for workers who have not yet entered the formal sector, but also as a motor for growth in economic activity. This is because the

amount of labor absorption is so large. Considering the experience that Indonesia has faced during the economic crisis, it would be no exaggeration if the private sector development is focused on SMEs.

Data from the Ministry of Cooperatives and SMEs in 2013 showed that the total value of Indonesia's GDP reached Rp 9.014,85 trillion. SMEs contribute Rp. 5.439,9 trillion or 60,34% of Indonesia's total GDP. The number of Indonesian SMEs in 2013 reached 57,895,721 million business units or 99.99% of the total business units in Indonesia, while the workforce number reached 114.14 million people or 96.99% of all Indonesian workers. The data shows that the role of SMEs in the Indonesian economy is very important in providing jobs and generating useful output for the community.

SCM has an increasingly important role in growth between companies and academic interests [4]. This is based on the concept of the company as part of several organizations that are oriented towards the supply of goods and services to end consumers [5]. From this perspective, several studies have verified that integration and collaboration in SCM can provide important benefits to the companies involved. Among these benefits are added value, efficiency creation and client satisfaction [6, 7] which is represented by decreasing inventory, improvements in service and quality and shorter product development cycles [8].

In the area globalization makes the world economy and the business world has undergone rapid changes. Organizations or companies as active players in it are required to be proactive in making changes as one of the "weapons and defense equipment" in designing and implementing strategies to survive and win the competition on an ongoing basis. The current dynamics of market tastes are changing, where innovation is required to adjust to market tastes. Innovation is an alternative for organizations to develop and survive dynamically and can adapt to the

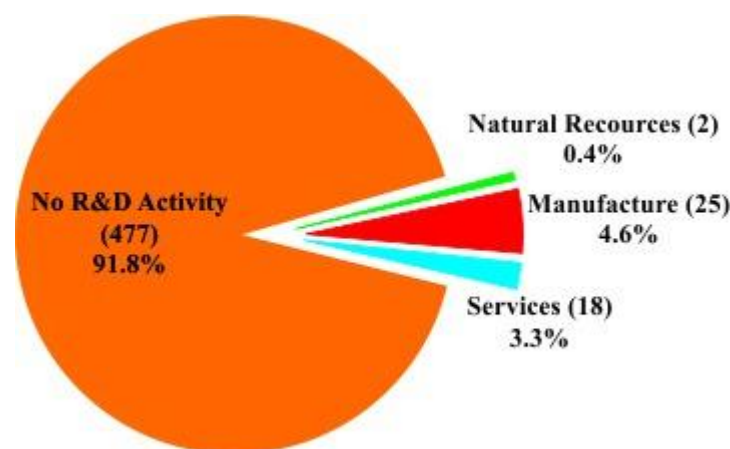
environment. Companies that do not innovate at all will be left behind by their customers [9].

[10] defined innovation as one of the important variables in determining performance. Innovation is becoming increasingly important as a means to survive, not only the growth of the unpredictability of the business environment and competitive conditions are increasing. Companies with high innovation capabilities will be more successful in responding to the environment and developing new capabilities that are able to achieve competitive advantage and high performance. Innovation in SMEs has not gone as expected because the limitations regarding finance, skills and experience are challenged not only to face competitors in the market arena by producing products to meet current demand, but also need to

consider the balance of the future that is needed as well.

Research conducted by [16] explains that intangible assets that are statistically proven to play a role in increasing company value are Research and Development (R&D) research and development activities. R&D activities are activities carried out by companies to create new products and processes, or to improve existing products, and find new knowledge that can be useful in the future [17].

R&D in industrial companies is the spearhead of an industry in producing new products required by the market [18]. But in reality only a small number of companies in Indonesia have done R&D. In fact, only a small number of companies in Indonesia have done R&D.



Picture 1.1. Percentage of R&D Activities for Companies on the IDX in 2015

Picture.1.1 shows that only 8,2% of the companies that has done the R&D activity in 2015, while 91,8% of others have not done it yet.

[11] identified four e-commerce potentials at the country level: increasing market efficiency, increasing operational efficiency, expanding access to markets, and associations. Market access with wider network opening of businesses, and networks, through e-commerce capabilities to connect and integrate into global supply chains [12, 13] in [14]. Due to the impact of E-Commerce technology to SMEs, it becomes important consideration in business and entrepreneurship literature [15]. However, SMEs in developing countries are slow to adopt e-commerce technology into their businesses.

[19] explained the general problems of SMEs performance in Indonesia are lack of working capital, marketing difficulties, limited access to resources (productive, finance, technology, information and markets), lack of technology skills and management, low productivity, low quality institutions and cooperative organization, lack of business networks. [20] identified five characteristics of SMEs in Indonesia that make this business important for the

country's economic development. First, it is owned by local residents and absorbs millions of workers in this country. Second, it is very common in rural areas, and their business is based on agriculture, so they are important for rural economic development. Third, labor-intensive, with many young people who are less educated and involved in this business. Fourth, their financial operations are from personal savings. Fifth, produce simple consumer goods. They serve the domestic market and are targeted at low-income consumers.

Based on this phenomenon, the authors traced the innovation and performance of the ProQuest Research Library, Scopus, Springer and DOAJ found 163 articles with organization, process, communication and product categories. The results of the System Mapping Study provide an overview of new opportunities to research the role of innovation in performance in the Puspipstek, Serpong area or exploit existing topics.

Puspipstek is a means of implementing directed and integrated research as a determinant of community needs and increasing awareness of knowledge about the role of research, science and technology in

national development. The function of Puspiptek in an effort to improve regional economic growth, the regional government together with the central government, industry and universities must provide a supportive conducive environment, such as facilitating licensing/ bureaucracy, building infrastructure, subsidizing land leases, etc.

The roles and functions of Puspiptek described above provide inspiration to the author to find out more about how the impact of innovation, R&D and e-commerce on the quality of the business performance of SMEs (partners) in the Puspiptek area.

2. Literature Review

2.1 Resource Base View (RBV)

According to [1] resources are anything that can be considered as the strength or weakness of a particular company as tangible assets tied semi-permanently to the company. [21] extended the definition to include all assets, capabilities, organizational arrangements, company attributes, information, knowledge, and others controlled by companies that enable companies to understand and implement strategies that can increase efficiency and effectiveness.

RBV comes from economic organizations, which discussed the advantages and competition theories related to the works of [22], [23] and [24] and focused on the company's internal resources for the main determinants of competitive success. In particular, Edith Penrose made its own contribution to the development of RBV, and [11] emphasized that Penrose has been instrumental in developing the ongoing strategic management of the RBV. RBV has become a standard for explaining why companies in the same industry vary systematically in performance over time [25]. This shows that individual effects, the company's specific resources on performance can be significant [26].

2.2 Innovation

Innovation is a technological, managerial and social process, where new ideas or concepts are first introduced to be practiced in a culture [17]. Innovation is a determining factor in industrial competition and is a formidable weapon in the face of competition and becomes a key factor to survive in the global era.

[16] describe the process of innovation in products by collaborating between Supply Chain SMEs and large clients in the mechanical sector in Brazil. [27] show that collaborative practices in Supply Chain facilitate innovation in products between Korean SMEs. [28] studied Canadian SMEs and found innovations in this company centered on external networks established with their Supply Chain.

2.3 Research and Development

R&D has played an important role in corporate strategy since the first company laboratories were established in the early 20th century [11], but the first real consideration of the impact in the strategy literature seems to be [4], which shows that R&D is an important determinant of firm performance (measured as ROA). R & D is influenced by corporate governance, which can change more. For example R & D is lower in companies managed by financial controls [29] those who have more board members outside [30] those who are under pressure to meet analyst estimates [31].

[32] suggested that SCM does not only exchange material assets. SCM also exchanges financial assets, technology assets, information and knowledge. this kind of interaction calls for certain partnerships in different functional fields, such as marketing and sales as well as research and development (R & D)

2.4 E-Commerce

E-commerce is the basis of m-commerce by [7] which is identified to consist of Business To Business (B2B) and Business to Customer (B2C). B2B e-commerce applications in all businesses, while the B2B e-commerce is between businesses/ companies and consumers. B2C services themselves vary from e-mail or cybermall, online advertising, electronic catalogs, online payments, customer service, online service industries. The term e-commerce generally refers to the use of information and communication technology to conduct transactions essentially selling goods and services through the Internet [26].

The use of IT in SCM is a basic condition to ensure the interaction between the company and the Supply Chain, they [3]. [6] suggested that with e-commerce, access to information would be easier and provide new services and products for customers, improve the image and reputation of the company. According to [33] the application of e-commerce can improve a company's competitiveness, communication capabilities, and the performance of products and services. [17] suggested that the application of e-commerce had a positive effect on operational performance.

2.5 Business Performance

Company performance is considered a multidimensional construction [34] and is a measure of success and achievement of the [35]. A limited set of financial performance measures can adversely affect the long-term sustainability of the organization, so organizations must develop various performance measures [13]. [1], [36] and [37] considered the quality of the product, coupled with the operating and financial performance of the company, becoming the dimensions of their performance. Furthermore, [28] following a review of the literature on strategic

management, marketing and operations management, have chosen three dimensions related to performance: financial performance, operational performance, and product quality. Consistent with previous research, this study relies on several performance measures to achieve resilience. So, three dimensions related to performance have been chosen: product quality, operational performance, and financial performance. The study further recommends that science parks apply practices that are easier to move in the short term and extend initiatives through the entire Puspipetek supply chain in the long term. Of course

the concept of SCM correlates and always works together to get optimal results. In this study researchers combine the concept of integrated network SCM to achieve efficient and effective performance to achieve competitive advantage between competitors. [38] transformation in the contemporary paradigm in the business environment is that individual businesses may no longer compete solely as an entity's own government, but rather as a supply chain network to achieve maximum performance. In line with this statement the framework of this research is as follows:



Figure 2. Framework Integrated Supply Chain Management Model for Puspipetek Serpong

The object of this research is to investigate the level of sustainable practices of influence that has been on sustainable performance in Puspipetek. This study further used SEM to examine causal relationships between variables. The results of this study will help

Puspipetek identify the variables that contribute to the performance of tenants. Therefore based on the literature and the following objectives the hypothesis proposed :

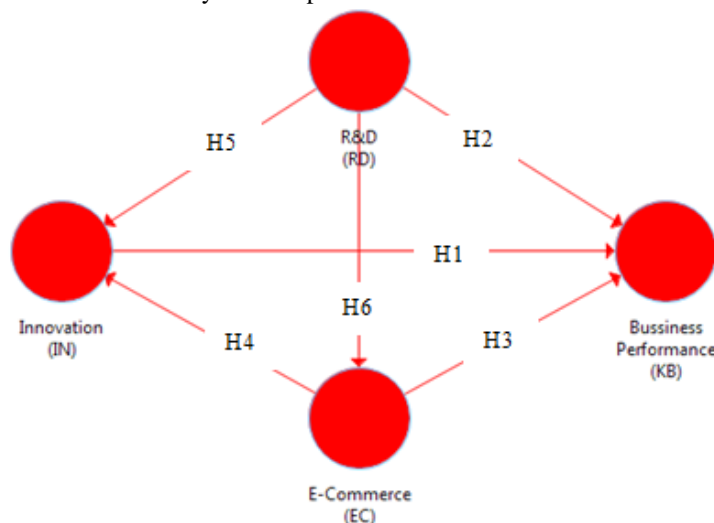


Figure 3. Conceptual and Hypothetical Path

- H1: Innovation has significant impact on the performance of SMEs
 H2: R&D has significant impact on the performance of SMEs
 H3: E-Commerce has significant impact on the performance of SMEs
 H4: E-Commerce has significant impact on the innovation of SMEs
 H5: R&D has significant impact on innovation of SMEs
 H6: R&D has significant impact on E-Commerce of SMEs

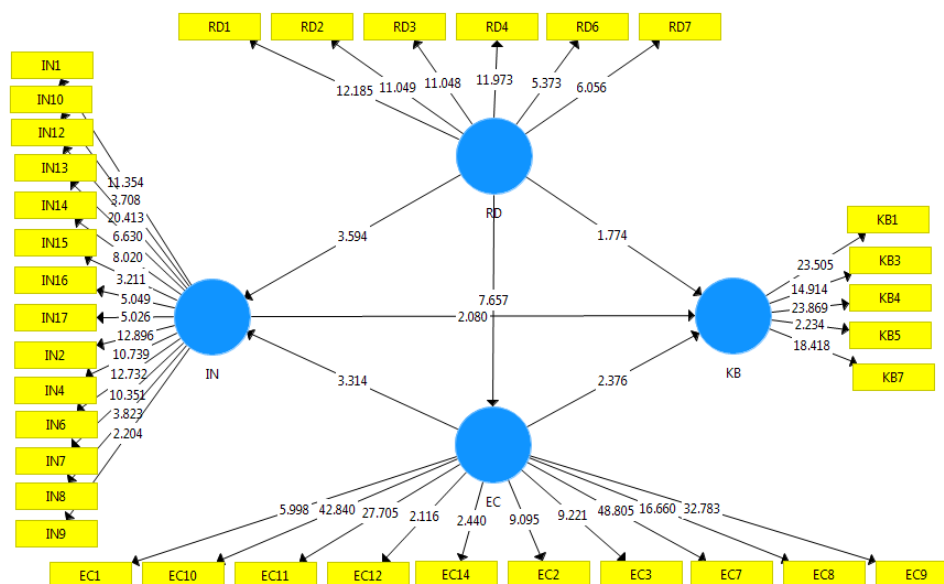
3. Methodology and Data

The research methodology used in the writing of this article was carried out by a survey of the business performance activities of SMEs in the food sector in the Puspipetek Serpong area during 2017 and 2018.

Data was obtained from tenants in the Puspipetek area (Technology Business Incubation Center, Assessment Agency and Application of Technology and National Nuclear Energy Agency).

The author uses Smart Partial Least Square (Smart PLS) version 3.2.8 to see the impact of innovation, R&D and e-commerce on the performance of SMEs businesses in the Puspipstek area and the impact of

R&D and e-commerce on SMEs innovation performance. The Concept Model and calculation results by Smart PLS are:



Picture 2.1. Result of Bootstrapping by program Smart PLS version 3.2.8

To clarify the relationship between variables are presented in the following table below:

Table 2.1. Path Coefisient T Statistics

Path Coefisient	Value
RD → IN	3,594
RD → EC	7,567
RD → KB	1,774
EC → KB	2,376
EC → IN	3,314
IN → KB	2,080

From the table above, the relationship between RD → IN has a value of 3,594; RD → EC has a value of 7,567; RD → KB has a value of 1,774; EC → KB has a value of 2,376; EC → IN has a value of 3,314; IN → KB has a value of 2,080.

4. Empirical Results and Discussion

After testing through Smart PLS with 100 samples, it was concluded that the increase in SMEs business performance in Puspipstek Serpong was greatly influenced by revenue growth from e-commerce. The results of Smart PLS show that innovation has an influence of 2,080 on improving the business performance of SMEs, this value is still above the value of a significant level <1,960.

Innovation is important in maintaining business; with innovation SMEs can compete with other similar

entrepreneurs. SMEs in the Puspipstek area are SMEs that are based on production, so they can survive either in short or long term.

R&D activities in SMEs in Puspipstek Serpong have not experienced much improvement by showing Smart PLS results of 1,274 on SME business performance; this value is still below the significant level of <1,960, while the effect on innovation shows a value above a significant level of 3,594. The influence of R&D on e-commerce also shows a value of 7.657, this value is still above the value of a significant level <1.960.

R&D of SMEs in Puspipstek does not have a direct impact on the results of business performance; this is because SMEs have limited resources and investments in R&D. Moreover, SMEs products in the food sector have a relatively fast period of time compared to other types of businesses other than

food. But with the existence of Puspipstek these limitations can be minimized by R&D resources and facilities owned by Puspipstek.

The implementation of e-commerce has an influence of 2,376 on improving the business performance of SMEs, this value is still above the value of a significant level <1,960. Although, the effect on innovation shows the value above a significant level that is 3,314.

In line with the increasingly easy access to information technology and the increasing number of SMEs with high school education, marketing can be direct to consumers. Access to the Internet at this time does not become a barrier either in terms of knowledge, economic and internet network capabilities. SMEs can run a business through the Whatsapp application and with the help of applications such as Go-food, Grabfood.

5. Conclusion and Suggestion

In Indonesia SMEs are currently considered as an effective way of alleviating poverty. SMEs are the largest group of economic actors in the Indonesian economy and have proven to be the safety valve of the national economy in times of crisis. In addition to being the largest business sector contributing to national development, SMEs also create considerable employment opportunities for domestic workers, thus greatly helping efforts to reduce unemployment.

This study found interesting findings that integration with suppliers is an important factor that plays a role in improving and maintaining supply chain performance in the current era of globalization. Effective coordination and communication for information sharing between various stakeholders and suppliers enables companies to maintain their performance. The results showed that integration with positive suppliers significantly affected supply chain performance.

For a long term, SMEs business sustainability needs to carry out R&D activities in accordance with the capacity of SMEs. R&D conducted by Puspipstek SMEs with limited access to SMEs resources with the help of Puspipstek resources for R&D activities can be done, although the influence of R&D activities does not have a direct significant effect on business performance. But R&D activities on innovation and e-commerce have a significant effect.

The development of information and communication technology is getting faster, so that resources are required to support adopting e-commerce. In accordance with current knowledge and Internet access capabilities, the effect of e-commerce on SMEs business performance and innovation has a significant effect.

The benefits of the results of this study can add to the development of business administration science. As

for Puspipstek management, the results of this study can be accepted as a contribution in improving service performance to tenants in the Puspipstek Serpong area. It is the duty of all relevant stake holders such as Puspipstek management, the central government, local governments and industry players to help grow SMEs, expected to have a positive impact on the development of Indonesia's national economy.

References

- [1] Afris W. Hasuti, Abbas Mardani, Dalia Streimikiene, Ali Sharifara and Fausto Cavallaro. *The Role of Process Innovation between Firm-Specific Capabilities and Sustainable Innovation in SMEs: Empirical Evidence from Indonesia*. Sustainability, doi:10.3390/su10072244, 2018.
- [2] Alicia Rodríguez and María J. Nieto. *Does R&D Offshoring Lead To Sme Growth? Different Governance Modes And The Mediating Role Of Innovation*. Strategic Management Journal, Doi: 10.1002/Smj.2413, 2015.
- [3] Bank of Indonesia. *Profil Bisnis Usaha Mikro, Kecil dan Menengah (UMKM)*. Bank of Indonesia Press, 2015.
- [4] Basu Govindaraju et.al. *A Structural Equation Model for the Study of Sustainable Performance by Private Universities in Malaysia*. International Journal of Supply Chain Management, ISSN: 2050-7399, 2019.
- [5] Central Agency of Statistic. *Statistik Indonesia 2016*. Central Agency of Statistic Press, 2016.
- [6] Craig Lee, Rob Hallak, Shruti R. Sardeshmukh. *Innovation, entrepreneurship, and restaurant performance: A higher-order structural model*. Tourism Management, doi : 10.1016/j.tourman.2015.09.017, 2016.
- [7] Dimitrios K. E. Psomas. *The impact of innovation capability on the performance of manufacturing companies: the Greek case*. Journal of Manufacturing Technology Management, doi : 10.1108/JMTM-12-2012-0117, 2015.
- [8] Djoko Roespinoedji et. al. *Determinants of Supply Chain Performance: Moderating Role of Firm Size in Tourism Hotel Industry in Indonesia*. International Journal of Supply Chain Management, ISSN: 2050-7399, 2019.
- [9] Fauzan Fahrurrazaman and Apol. Subriadi. *An Analysis of E-Commerce Adoption for Small and Medium Enterprises in Indonesia*. The 1st International Seminar on Science and Technology, August 5 th 2015, Postgraduate Program Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia, 2015.

- [10] EmenikeKalu, O., & Obasi, R. *Long-run relationship between marketing of bank services & the performance of deposit money banks in Nigeria*. International Journal of Economics, Business & Management Studies, 3(1), 12-20, 2016.
- [11] Jafar Rezaei et. al. *Supply chain drivers, partnerships and performance of high-tech SMEs An empirical study using SEM*. International Journal of Productivity and Performance Management, doi : 10.1108/IJPPM-01-2017-0017, 2018.
- [12] James H Love and Stephen Roper. *SME innovation, exporting and growth: A review of existing evidence*. International Small Business Journal, doi: 10.1177/0266242614550190, 2015.
- [13] Ha, T. P. T., & Tran, M. D. *Review of Impacts of Leadership Competence of Project Managers on Construction Project Success*. International Journal of Emerging Trends in Social Sciences, 4(1), 15-25, 2018.
- [14] Marco Cucculelli and Cristina Bettinelli. *Business models, intangibles and firm performance: evidence on corporate entrepreneurship from Italian manufacturing SMEs*. Small Bus Econ, doi : 10.1007/s11187-015-9631-7, 2015.
- [15] Georgantopoulos, A. G., Poutos, E. I., & Eriotis, N. *Recent Developments and Trends in Accounting Information Systems*. Journal of Accounting, Business and Finance Research, 3(1), 1-9, 2018.
- [16] Mwanja, S. K., Evusa, Z., & Ndirangu, A. W. *Influence of Corporate Social Responsibility on Firm Performance among Companies Listed on the Nairobi Securities Exchange*. International Journal of Applied Economics, Finance and Accounting, 3(2), 56-63, 2018.
- [17] Eze, P. *An Analytical Model of Demand for Hospital Inpatient Care*. International Journal of Social Sciences Perspectives, 2(1), 80-86, 2018.
- [18] Ministry of Research, Technology and Higher Education. *Pedoman Pembangunan dan Pengembangan Taman sains dan Teknologi (Science Technology Park)*. Kemenristekdikti Press, 2015.
- [19] Pedro S. Acosta, Simona Popa and Daniel P. Marqués. *E-business, organizational innovation and firm performance in manufacturing SMEs: an empirical study in Spain, Technological and Economic Development of Economy*, doi: 10.3846/20294913.2015.1074126, 2015.
- [20] Peter J. Sher and Phil Y. Yang. *The effects of innovative capabilities and R&D clustering on firm performance: the evidence of Taiwan's semiconductor industry*. Amsterdam : Elsevier, 2005.
- [21] Philippe Aghion, Ufuk Akcigit and Peter Howitt. *Lessons from Schumpeterian Growth Theory*. American Economic Review, doi : 10.1257/aer.p20151067, 2015.
- [22] Cossiga, G. A. "Signals from the World of Economics. The Price Constant and the Democratic Issue". International Journal of Social and Administrative Sciences, 3(1), 1-21, 2018.
- [23] Piyush Sharma, Nebojsa S. Davicik, Kishore G. Pillai. *Product innovation as a mediator in the impact of R&D expenditure and brand equity on marketing performance*. Journal of Business Research, doi: 10.1016/j.jbusres.2016.03.074, 2016.
- [24] Rita Rahayu and John Day. *E-commerce adoption by SMEs in developing countries: evidence from Indonesia*. Eurasian Bus Rev, doi 10.1007/s40821-016-0044-6, 2016.
- [25] Rita Rahayu and John Day. *Determinant Factors of E-commerce Adoption by SMEs in Developing Country: Evidence from Indonesia*. Journal of Business Research, doi:10.1016/j.sbspro.2015.06.423, 2015.
- [26] Robert Huggins and Piers Thompson. *Entrepreneurship, innovation and regional growth: a network theory*. Small Bus Econ, doi : 10.1007/s11187-015-9643-3, 2015.
- [27] Sebastian Kot et. al. *Supply chain management in SMEs: evidence from Poland and Kazakhstan*. Engineering Management in Production and Services, doi: 10.2478/emj-2018-0014, 2018.
- [28] Setyawan A. Anton, Isa Muzakan, Wajdi F. Muhammad, Syamsudin, Nugroho P. Sidiq. *An Assessment of SME Competitiveness in Indonesia*. Journal of Competitiveness, doi: 10.7441/joc.2015.02.04, 2015.
- [29] Sharon A. Alvarez and Jay B. Barney. *Discovery and Creation: Alternative Theories of Entrepreneurial Action*. Strategic Management Society, doi : 10.2139/ssrn.900200, 2007.
- [30] Sherah Kurnia, Jyoti Choudrie, Rahim Md Mahbubur, Basil Alzagool. *E-commerce technology adoption: A Malaysian grocery SME retail sector study*. Journal of Business Research, doi: 10.1016/j.jbusres.2014.12.010, 2015.
- [31] Simone R.D and Guillermo Díaz. *Supply Chain Management Practices as a Support to Innovation in SMEs*. Journal of Technology Management & Innovation, ISSN: 0718-2724, 2012.

-
- [32] Mohamed, B. M., Rasheli, G. A., & Mwagike, L. R. "Marginal Effects of Factors Influencing Procurement Records Management: A Survey of Selected Procuring Entities in Tanzania". *International Journal of Social and Administrative Sciences*, 3(1), 22-34, 2018.
 - [33] Tan Yang, Jiyao Xun and Xiaofeng H. *British SMEs' e-commerce technological investments and firm performance: an RBV perspective*. *Technology Analysis & Strategic Management*, doi: 10.1080/09537325.2015.1019453, 2015.
 - [34] Thoo Ai Chin. *Adoption of supply chain management in SMEs*. Elsevier *Procedia-Social and Behavioral Sciences*, doi: 10.1016/j.sbspro.2012.11.173, 2012.
 - [35] Tim Mazzarol. *SMEs engagement with e-commerce, e-business and e-marketing*. *Small Enterprise Research*, doi 10.1080/13215906.2015.1018400, 2015.
 - [36] Zafarullah, M. "VAT and Accounting Issues and Solutions in UAE". *International Journal of Social and Administrative Sciences*, 3(1), 35-41, 2018.
 - [37] Wen-Ying Wang and Chingfu Chang. *Intellectual capital and performance in causal models Evidence from the information technology industry in Taiwan*. Yorkshire : Emerald Group, 2005.
 - [38] Yi-Chan Chung. *The Impact Of The Degree Of Application Of E-Commerce On Operational Performance Among Taiwan's High-Tech Manufacturers*. Pretorio : Scielo South Africa, 2013.