

INNOVATION AND RESEARCH AND DEVELOPMENT PARTNERSHIP IT'S IMPACT ON COMPETITIVENESS AND IMPLICATION TO NATIONAL PHARMACEUTICAL COMPANIES PERFORMANCE

Mas Rahman Roestan 

Doctorate of Management Science Program, Faculty of Economics and Business
University of Padjadjaran, Bandung, Indonesia
rahmanrustan@biofarma.co.id

Ernie Trisnawati Sule

Lecturer, Doctorate of Management Science Program, Faculty of Economics and Business,
University of Padjadjaran, Bandung, Indonesia

Surachman Suramihardja

Lecturer, Doctorate of Management Science Program, Faculty of Economics and Business
University of Padjadjaran, Bandung, Indonesia

Diana Sari

Lecturer, Doctorate of Management Science Program, Faculty of Economics and Business
University of Padjadjaran, Bandung, Indonesia

Abstract

Developing countries urge a high growth of pharmaceutical market. IMS Health showed data in 2009 – 2014 that increasing of it's pharmaceutical market CAGR in range of 14-17% is higher than global pharmaceutical market CAGR increased in range of 5 – 8%. Pharmaceutical Market growth is influenced by new innovative product. Therefore, prioritizing new product invention is important to increase the competitiveness through innovation strategy in terms of product, process and marketing innovations. National pharmaceutical companies must collaborate with research institutes, universities, and health communities through research partnership, product

development and technology transfer. The study is based on data provided in pharmaceutical companies in Indonesia. Analysis units are National pharmaceutical companies and as observation unit are directors or management representatives. Competitiveness is measured by indicators in three dimensions; quality, cost and time to market. Companies' performances are measured using indicators in three dimensions; profitability, market growth, and market share. Study conducted using descriptive and verificative methods. Partial Least Square Path Modeling (PLS-PM) approach was adopted. Primary data collected by survey using questionnaire and interview, while secondary data is analyzed from Companies Annual Report. Result of the analysis found a model that innovation could increase company's performance and through the competitiveness as well. Collaboration on R&D could increase company's performance through competitiveness. This model could be applied generally for increasing competitiveness and performance for other industries in Indonesia as well as other developing countries.

Keywords: Innovation, Research and Development, Competitiveness, Company's Performance, Pharmaceutical Industry

INTRODUCTION

The Indonesian pharmaceutical market is important in the Asian region as the fourth largest population in the world, Indonesia has the main factors to promote growth of the pharmaceutical industry. According to Ariana et al (2014), the pharmaceutical industry is an industry that relies heavily on research and development (R & D) activities with technological competence and innovation as an important factor in supporting the sustainability and the growth of the companies. The large population of Indonesia lures both foreign and national pharmaceutical industries to improve their competitiveness and to obtain better company performance with increased profitability, market growth and market share. Data of IMS indicated that the global pharmaceutical market increased by CAGR growth between 5-8% in 2009-2014, reaching the value of US \$ 1.13 to 1.16 trillion. The Indonesian pharmaceutical market recorded a CAGR growth of 9.7% per year, which is 1.5 times larger than the global pharmaceutical market growth in the same period. The CAGR of the Indonesian pharmaceutical market in the period of 2009 - 2014 has increased between 14-17%.

The global pharmaceutical growth was driven by discoveries of innovative drug products. Licenses of patent drugs and off-patent drugs may encourage the continuity of the national pharmaceutical market growth. Ariana et al (2014) stated that the expiration of patents of certain drugs have implications to research and development (R & D) base transnational companies in developed countries to revisit their business models and adapt to the changes. Since it is very

important for the national pharmaceutical industry to be able to prioritize the discovery of new drug products. As one of the efforts to improve competitiveness, the national pharmaceutical industry should have proper innovation strategies either in product innovation, process innovation as well as in marketing innovation. Improvement in innovation carried out by the national pharmaceutical industry has not yet shown any improvements in the discovery of new products. This is indicated by the registration of Intellectual Property Rights at the Directorate General of Intellectual Property Rights (Ditjen KI), Ministry of Justice and Human Rights, that are relatively low including inventions in the pharmaceutical field. The competitiveness of the national pharmaceutical industry will face issues due to the decrease in the discovery of active pharmaceutical ingredients or new chemical entities, decline in off-patent products, as well as the industrial conditions that are becoming more competitive. The national pharmaceutical industry should be able to cooperate with research institutes and universities. Several alternatives of this partnership include: joint research, joint development and technology transfer.

Research and development partnership is a trend that commonly occurs among academics at research institutes and universities. Studies on partnership of R & D in developed countries are frequently carried out, and it is known that such partnership is not merely performed among R & D and universities but also among R & D and private sectors / industries and private R & D and universities. Such partnership is not only conducted at national levels but also at international levels. The diversity has been studied intensively which leads to the formulation of effective research policy. Actually, the trend of R & D partnership is not only occurring in developed countries, but also found in developing countries, including Indonesia. In the global competition, the national pharmaceutical industry must compete with Multinational Companies dominated by developed countries. Industries in developed countries continuously strengthen its position by strengthening R & D and innovation, set up a holding or collaboration between industries and research institutions to establish a more competitive company.

Innovation in the pharmaceutical field has been conducted many times, including product innovation, process innovation and marketing innovation, on the other hand, R & D cooperative efforts with the purpose to discover drug products have been widely carried out between research institutes and universities, the government in this case acts as the regulator (Ministry for Research and Technology, Food and Drug Monitoring Agency BPOM and the Ministry of Health) and the national pharmaceutical industry. R & D partnership include research partnership, product joint development and transfer of technology. Although innovation and R & D partnership efforts have been carried out, new discoveries are not in line with such efforts, therefore the impact on the competitiveness improvement and performance of national

pharmaceutical companies needs to be examined. The research conducted in 2015 based on data in national pharmaceutical companies in Indonesia. The unit of analysis in this study is the national pharmaceutical industry and as the observation unit are the directors or managers representing the management.

THEORETICAL AND EMPIRICAL BACKGROUND

Innovation

Innovation is an effort to create changes aimed and focused on an economic or social potential. According to Schilling, (2005) types of Innovations can be distinguished from four dimensions namely product innovation and process innovation, radical and incremental, competence enhancing and competence destroying, as well as architectural and component. Grouping of innovation according to Tidd, Besant and Pavid, (2005), innovations are grouped into four types: product innovation, process, position and paradigm. Classification of innovations according to Achmed and Shepperd, 2010, are product innovation, process innovation and strategic innovation. Larry Keeley defines innovation as "creation of a viable new offering" elucidating that Innovations are not merely inventions, Innovations must render value, Innovation does not mean completely new, Innovation is not merely product innovation, but also new methods in operating business or new systems (process innovation), or new methods in dealing with customers (marketing innovation). According to Manzano, Kuster and Vila (2005), product innovation is the output of an organization in the form of products that are visible such as, new drugs, electronic equipment's and others. Innovation of products specified by Tidd, Bevand and Pavid, (2005), is the creation of a new product for an organization, introduced to the market through utilization and commercialization, integration of existing technologies and the thinking pattern of a process. Product innovations include creating ideas, important knowledge acquisition and transformation into useful hardware or procedure and introduce it to the public and the distribution. Product innovation may be either new or development of products or services already existing to obtain a new feature / function or benefit enhanced than before.

Innovation Process according to Manzano, Kuster and Vila (2005), is an innovation conducted on a process that produces output of an organization, for example, innovation to the company's supply chain, the innovation process is more complex to imitate, as it is not visible from the outside. Tidd (2000) stated that innovation process could be distinguished from the refinement of process, which makes changes to a lower level, through a refinement process that involves the implementation of the same business process with a slight increase in efficiency or effectiveness. Process improvement and innovation requires changes in work culture. Focus

needed on operational performance, measuring results and employee empowerment are aspects of cultural change.

Marketing innovation According to Jebsen (2006) is an innovation that is carried out continuously by adapting to new situations. Historically there has been an evolution in the development of market innovation. Market innovation may be conducted through education, as marketing while providing education to customers can be studied further. Marketing innovation in the pharmaceutical industry includes the distribution process, and how to promote the product.

Research and Development Partnership

Research and Development partnership is used to increase competitive advantage and decrease the time required to develop and market new products. Data released by WHO, R&D can function optimally if conducted in partnership with other stakeholders. In the pharmaceutical field, company's research and development activities may be conducted by the company on its own or in partnership with various stakeholders, so that the pharmaceutical industry can form an effective health care system and functioning properly through its products either drugs or vaccines. Research and development of pharmaceutical products including vaccines have various stages to be passed, ranging from basic research up to the process where it can be mass produced by the industry and used by the public. According to Marcus, in 2005, the trend of biotechnology indicated that more associations or communities where research groups of food and health are cooperating, for example in the field of pharmacy is the production of beta-carotene from rice for vitamin A deficiency, as well as the development of Hepatitis B vaccines, diarrhea and others originating from banana or potato cells. The competition in the pharmaceutical industry is very strict so partnership between institutions is required. According to Schilling, (2005), companies will gain several benefits from partnership; companies may acquire the necessary expertise or resources in an earlier time compared to carrying out their own research. Research and development partnership may also reduce costs, acquire knowledge from its partners, and share risk of research failures. According to Freitas (2013), characteristics of collaboration with universities can be specific when cooperating with industrial partners that are already mature. In this study, research and development partnership to be examined include joint research, joint development and technology transfer. Studies discussing technological-up capabilities in Indonesia has never been carried out due to the lack of specific indicators describing technological capabilities that can be compared with other countries. The pharmaceutical sector is considered to have the technological capability that is supported by the presence of R & D and innovation activities that are quite dynamic. Ariana et al (2014) the ability

of the company's technology can be viewed from two dimensions, namely the capability of the product technology and process technology capabilities. Product technology capabilities include the ability to create, design, and commercialize new products and services, including improvement in the design and functionality of existing products. Capability of process technology includes the company's ability to reproduce a product or perform repetitive delivery.

Competitiveness

The definition of competitiveness according to Spulber, 2004 is the difference between the value created by the company compared to the value created by competitors, where the creation of total value for customers, suppliers and owners of the company must be greater than the total value created by competitors. In strategic management, sustainable competitive advantage is the company's advantage that is relative to competitors. Source of advantage may be something different conducted by the company and is difficult to replicate. According to Walker, 2009, a competitive advantage can be obtained from the value of something that is generated and cost factors also reflects superior economic performance compared to the competitors. To protect the value difference, a mechanism that is hard to duplicate must be created. To achieve sustainable competitive advantage, companies must achieve a dominant marketing performance.

Competitiveness of Corporations in Indonesia ahead of AFTA in 2015 are affected by Business Environments and Economies where the macro economy is stable and under control, slow growth of the real sector, low competitiveness, problems in the investment climate, growth relying on consumption; Social environment also has an impact on competitiveness, where poverty and unemployment rate increases, lack of social facilities development, education and health, issues in effecting eradication of corruption and illegal drugs infecting students and the young generation. Marcus, 2005 found that sustained competitive advantage can be gained through timing and positioning, collaboration of companies, globalization and innovation, which will cause continuous repositioning. While the competitiveness itself will be obtained from Cost advantages (Similar products at low cost) and differentiation advantage (unique product at a premium price). Meanwhile, Competitive advantage can be gained when a company has diversification in its existing market product. Low price and unique product strategy is a competitive advantage strategy. Time to Market (TTM) is the time required for the development of a new product to enter the market. The timing shall be observed for the introduction of such new products. The time set for the introduction of the product is critical, as it will have an impact on the financial aspects as well as the market perception. In this study, competitiveness cost will

be viewed from the perspective of the cost and product quality that is better than those existing in the market and the launching of such new products to be earlier (time to market).

Corporate Performance

In general, companies use financial data to measure their performances. In addition to the financial aspect, other aspects can also be measured using Balanced Scorecard, in which the Balance scorecard measures customers, internal process and learning and growth. organizational performance is a measure of success or achievement by an organization, which is measured every certain period of time and measured with the following dimensions:

- a. Financial factor, which relates to the company's financial such as corporate profitability, sales growth and market share.
- b. Non-financial factors which relates to non-financial matters such as customer satisfaction and customer loyalty.

Company's performance according to Aaker (2004) can be measured by measuring the volume of sales, market share and profitability. Whereas according to Walker, Boyd and Larreche (2003), company's performance is the description of the achievement of corporate objectives through increased sales and market share. In this study, the performance of the company can be measured through indicators of profitability, sales volume (market growth), and market share.

Conceptual Framework

Product innovation, process innovation and marketing innovation and partnership of products' research and development including joint research, joint development and transfer of technology, can be carried out by the pharmaceutical industry to improve competitiveness and improve company's performance. The national pharmaceutical industry competitiveness can be enhanced by improving the quality, usefulness of products at competitive prices, as well as time to market of new products so as to increase profitability, market share and market growth. By the creation of superior customer value, competitive advantage can be achieved. From the above research paradigm, the hypotheses are:

1. Innovation and Partnership in research and development has been carried out accordingly by national pharmaceutical companies.
2. Innovation and Partnership of research & development has positive effects on the competitiveness of the national pharmaceutical industry partially and simultaneously.
3. Innovation, Partnership of research & development and competitiveness has positive effects on the performance of national pharmaceutical companies partially and simultaneously.

4. Innovation and Partnership of research & development has positive effects on the performance of national pharmaceutical companies through competitiveness.

METHODOLOGY

In accordance with the research objectives to be achieved, a descriptive and verificative type of research is used with the aim to obtain a description of the nature and characteristics of the variables studied and to observe and analyze the relationship between the variables through hypothesis testing. Verificative Research is basically to test the validity of a hypothesis which is implemented through data collected using questionnaire, survey and interview, whereas in this study innovation and R & D partnership will be tested whether it has an impact on the improvement of competitiveness and performance of national pharmaceutical companies.

Independent variable in this study is an innovation that includes product innovation, process innovation and marketing innovation as well as variable of research and development partnership that include joint research, joint development and transfer of technology, while the dependent variables are competitiveness and performance of national pharmaceutical companies. Data for innovation and research & development partnership were obtained from primary data of national pharmaceutical companies and the competitiveness were also obtained thereof, while for the performances of the national pharmaceutical companies were obtained from primary data as well as secondary data or Management Reports. Primary data is collected using questionnaire, survey and interview with directors or management representatives.

The analysis technique used is structural equation modeling with an approach of Partial Least Square Path Modeling (PLS-PM). Determination of sample sizes in PLS-PM refers to the most formative relationship in the model (Hair, 2013) In this study the most formative relationship are of 3 (three) recorded from the second sub-structure in the model. The formula used to test the reliability of the instrument in this study is Coefficient Alpha (α) of Cronbach. The measurement of variables of Innovation, Competitiveness and Performance of national pharmaceutical companies is conducted by measuring the Semantic Differential. To give a general overview of assessment of board of directors or the management of the national pharmaceutical companies over each variable of innovation, R & D partnership and competitiveness, the categorization was made on average scores differently for each variable. Descriptive hypothesis is a hypothesis related to efforts to draw general conclusions of every research variables including variables of innovation and research and development partnership.

Based on the conceptual hypothesis proposed, in which the conceptual hypotheses were related/linked, the conceptual hypothesis were first depicted in a framework of relationship flow between the variables in which within the framework the relationship will be seen as a

Structural Equation Modeling. The first model describes the relationship between variables of innovation and research & development partnership to the competitiveness, whereas the second model describes the relationship of Innovation, research and development partnership and competitiveness on national pharmaceutical companies' performance. Estimation parameter methods in PLS is the least square method of which the calculation process is done by iteration, where iteration will cease if it has reached the convergent condition.

ANALYSIS AND RESULTS

Descriptive Analysis

Innovation

In this research the innovation investigated includes three dimensions: product innovation, process innovation and marketing innovation.

The product innovation carried out by the national pharmaceutical industry includes several indicators that is the different product innovation from the previous *pharmacotherapy* group (products diversification), product innovation which is still in the same *pharmacotherapy* group, innovation expediency indication and packaging innovation. From the product innovation comparison done by the national pharmaceutical industries, it can be seen that the most practiced packaging innovations, Innovations made by the national pharmaceutical industries can be categorized innovative for packaging innovation. Packaging innovation also strongly supports the consumer interest to the marketed product. Several packaging innovations include using plastic containers for medicine bottles and renounce the use of glass packaging. This is in addition to cheaper, it is also more practical for consumers, easy to carry while traveling, unbreakable and lighter.

The Innovation Process has been done much by the national pharmaceutical companies including several indicators, namely innovation in the production process, test process, process of handling raw materials, *intermediate products* storage process (intermediate product), the final product storage and waste handling process. From the comparison of the innovation process conducted by the national pharmaceutical industries, it can be seen that the innovation of testing process and the production process are mostly widely applied. This can increase the efficiency of the use of material and time and labor.

The marketing innovation or improvement made by the national pharmaceutical companies including several indicators, namely the distribution innovation, promotion innovation, kit / gimmick and sales method innovative. From the comparison of marketing innovation conducted by the national pharmaceutical industry, it can be seen that sales method innovation, kit / promotional gimmick are mostly done.

Research and Development Partnership

In this research, the partnership and development research researched covers three dimensions namely research partnership, development partnership and transfer of technology.

Research Partnership conducted by the national pharmaceutical companies is conducted for the production process research and test methods research. The research results showed that the research partnership is not much to do in the national pharmaceutical companies. This is because the research phase requires research facilities, research resources and a relatively long time to get a new product. It is obtained the data of the research result showing that although the research partnership is not conducted by the national pharmaceutical companies in the last five years, but when it is done, its accuracy is quite high, largely according to the needs and timeliness reach more than ninety percent.

The development partnership conducted by the national pharmaceutical companies is implemented for product development. Just like the research partnership, the development partnership is not much to do in the national pharmaceutical companies because it requires up-scale facilities, and a relatively long time to get the new product. The data of the research result obtained shows that development partnership is not done by the national pharmaceutical companies in the last five years, and when done, its accuracy is largely not in accordance with the needs and inadequate timeliness that is under thirty percent.

Transfer of technologies by the national pharmaceutical companies is implemented for production technology and testing technology. From the research results, the data showed that there is an activity gap of technology transfer in national pharmaceutical companies, that there are many companies that conducting the technology transfer is very low (none in the last five years), and there a also many companies that transfer technology with high frequency. National Pharmaceutical industries are currently widely implement the transfer of technology to manufacture a new product. During this time the national pharmaceutical industry is acting passively, waiting for an off-patent of medicine products. Transfer of technology is mostly done because it is relatively faster to get new products but have to wait for the off-patent and therefore cannot sell at a premium price for patented medicines have controlled the market and the growing trend in disease patterns that will need other more effective new medicines in tackling the new disease.

Competitiveness

In this research the competitiveness examined includes three-dimensions that is quality, cost or price and time to market. The competitiveness of the national pharmaceutical companies are considered high for the products quality and price of its products, but still low for the

competitiveness at the time to market. This is because in terms of quality, the products of the national pharmaceutical companies are already compliant and has been approved by the regulator, in which the pharmaceutical products regulator have followed the international standards evidenced by the recognition of medicines system control in Indonesia by WHO (World Health Organization), and has been recognized by PICs (Pharmaceutical Invention Convention). In terms of time to market is low due to almost all the national pharmaceutical companies behave passively waiting for the expiration of a medicine patent.

Companies Performance

In this research the performance researched covers three dimensions and indicators that is profit (profitability), market growth (market growth) and market share (market share). The profit of national pharmaceutical companies' growth is still considered small. The market growth (market growth) of the pharmaceutical market value varies greatly from their respective national pharmaceutical companies. The value varies greatly are also gained for the market share. This means that some of the pharmaceutical companies are unable to increase its market growth, and even some of them decreased its market share. Overall, the performance of the national pharmaceutical companies is very diverse. Some companies are able to increase the market growth and its market share. Some national pharmaceutical companies that able to increase the market growth and market share, have a network of partnership with several research institutions as well as being active in acquiring new products production methods.

Inferential Analysis

Measurement Model Analysis

Table 1: Analysis of Innovation Variable Validity and Reliability

Dimension	Validity Coef.	R2	VE	P Values
Product Innovation	0.828	0.685	0.315	0.000
Process Innovation	0.965	0.931	0.069	0.000
Marketing Innovation	0.924	0.853	0.147	0.000
Composite Reliability		0.933		
Average Variance Extracted		0.823		

The calculation result of the validity coefficients (loading factor) for each indicators measuring Innovation variables give greater validity value than 0.500 with the p. value less than 0.05 or in other words, the validity of the test results of the valid dimension conclude all dimensions are valid. The most important dimension in measuring innovation variables is the process

dimension. The reliability coefficients is based on the value of reliability composite which gives value of 0.933 greater than 0.700 and the value of Average Variance Extracted os 0.823 greater than 0.50 shows both the items is reliable in measuring Innovation variables. Process Innovation need to improve by the national pharmaceutical companies because it can accelerate and le improve process efficiencies that can reduce costs and processing time, it is also an increase the production capacity which increased product sales capabilities to increase national pharmaceutical companies earnings.

Validity and Reliability

Table 2: Variables of Development Research Partnership

Dimension	Validity Coef.	R2	VE	P Values
<i>Joint Research</i>	0.958	0.917	0.083	0.000
Transfer of Technology	0.944	0.891	0.109	0.000
<i>Joint Development</i>	0.893	0.797	0.203	0.000
Composite Reliability		0.952		
Average Variance Extracted		0.868		

The calculation result of the validity coefficients (loading factor) for each indicators measuring the Research and Development Partnership variables gives validity value greater than 0.500 with the value of p. value less than 0.05 or in other words, the dimensional validity of the test results conclude all dimensions. The most important dimension influences or the most relevant in measuring the variables of Research and Development Partnership is the Joint Research dimension or research partnership to acquire new products. The reliability coefficient is based on the reliability composite value of 0.952 greater than 0.700 and the Average Variance Extracted value of 0.868 greater than 0.50 shows both the items is reliable in measuring the Research and Development Partnership variables. Joint research or research partnership is the essential requirement of the pharmaceutical companies, by conducting joint research, it will open up the opportunities for product development of new products without waiting for the off patent of the new medicines product that are needed by the public. Joint research is also a solution to anticipate rapid changes in disease patterns and anticipate the disease outbreaks in which the effective medicines are needed immediately.

Table 3: Analysis of Competitiveness Variable Validity and Reliability

Dimension	Validity Coef.	R2	VE	P Values
Quality	0.654	0.428	0.572	0.000
Cost / price	0.747	0.558	0.442	0.000

Time to market	0.877	0.769	0.231	0.000	Table 3...
Composite Reliability	0.807				
Average Variance Extracted	0.585				

The calculation result of validity coefficients (loading factor) for each indicators that measure Competitiveness variables give the validity value greater than 0.500 with the p. value less than 0.05 or in other words, the test result of the dimension validity conclude all dimensions. The most important dimension influences or most relevant in measuring Competitiveness variables is the dimension of Time to Market. The reliability coefficient is based on the reliability composite value of 0.807 is greater than 0700 and the value of Average Variance Extracted of 0.585 greater than 0.50 indicates both items is eligible in measuring the Competitiveness variable.

Table 4: Analysis of Performance Variable Validity and Reliability

Indicators		Validity Coef.	R2	VE	P Values
Profit	Z1	0.879	0.773	0.227	0.000
Market growth	Z2	0.756	0.572	0.428	0.000
Market share	Z3	0.872	0.760	0.240	0.000
Composite Reliability			0.875		
Average Variance Extracted			0.702		

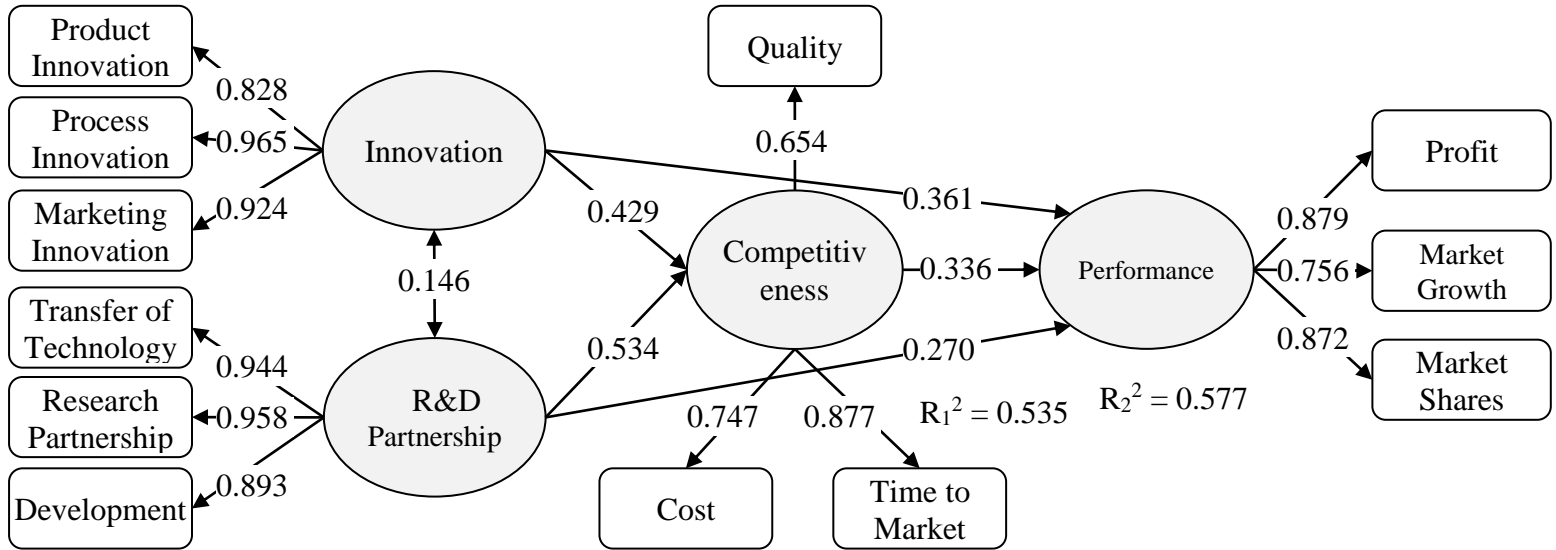
The calculation result of validity coefficients (loading factor) for each indicator gives the validity value greater than 0.500 with the p. value of less than 0.05 or in other words, the validity of the test results conclude all the indicators are valid. The most important indicators influencing or most relevant in measuring the company's performance is an indicator of profit. The reliability coefficient is based on the reliability composite value of 0.875 greater than 0.700 and the Average Variance Extracted value of 0.702 is greater than 0.50 indicates the three reliable items in measuring the company's performance variables.

Analysis of Effect Model of Innovation and Research Partnership and Development against the Competitiveness and Its Effect on Performance of the National Pharmaceutical Companies

The research found the statistical model of Innovation Influence and Research and Development Partnership against the Competitiveness and Influence on Performance of the National Pharmaceutical Companies as follows: $Competitiveness = 0.429[Innovation] + 0.534 [Research\ and\ Development\ Cooperation]$

$$Performance = 0.361[Innovation] + 0.270 [Research and Development Cooperation] + 0.336[Competitiveness]$$

Figure 1. The Innovation and Research and Development Partnership Effects against the Competitiveness and Its Effect on the National Pharmaceutical Companies Performance

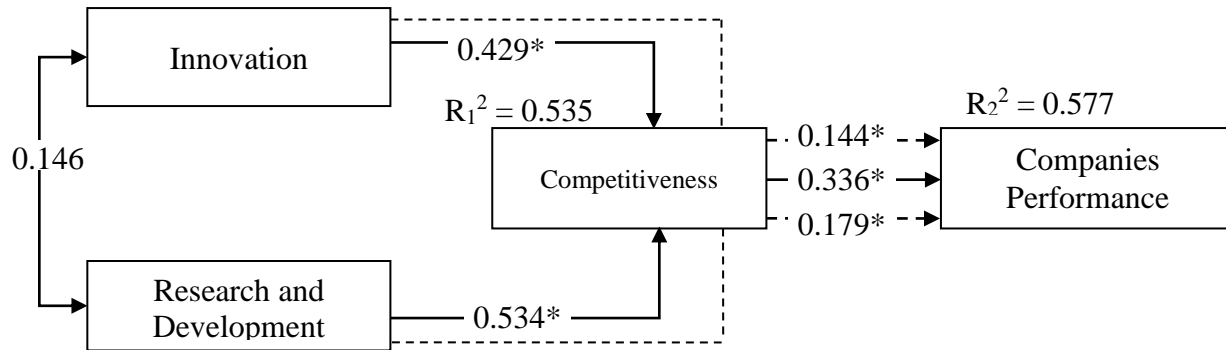


Prior to drawing the conclusions and making the business decisions based on the models that have been developed, firstly the research hypothesis testing is conducted

Table 5: Recapitulation of How Big the Effect of Innovation and Research and Development Partnership against the Competitiveness and Its Effect on the National Pharmaceutical Companies Performance

Variable	Competitiveness		Performance	
	Directly(Total)	Directly	Indirectly	Total
Innovation	0.429	0.361	0.144	0.505
Research and Development Partnership	0.534	0.270	0.179	0.450
Competitiveness		0.336		0.336

Figure 2. Effects of Innovation and Research and Development Partnership against the Competitiveness and its Influence on the National Pharmaceutical Companies Performance



Research findings Model above can apply generally to the other national industries other than the pharmaceutical industries. To enhance the competitiveness, the company must increase its innovation. The National industries in Indonesia and other developing countries should increase research and development partnership for the improvement of national competitiveness. Research and development partnership can be in the form of research partnership (basic research), development partnership of new products, as well as transfer of technology, which provides the most effect on increasing competitiveness. In general, an increase in the national companies performance in Indonesia and other developing countries can be obtained from increased innovation in the company, as well as through increased competitiveness gained from enhanced partnership in research and development of new products.

DISCUSSION AND CONCLUSION

Improved performance of national pharmaceutical companies can be obtained from the increased innovation, where the dominant innovation is the process innovation especially to improve efficiency and increase the production capacity which increased productivity and sales of products that will have an impact on increasing company profits. To increase the competitiveness in which the discovery of a new medicine products will take a long time, high costs and resources that meet the requirements, both in the number and qualifications of its investigators, as well as equipment and facilities owned other than the raw material needs with the more import components, so to carry out the independent research, it will be a source of expenditure resource that has not been clear its output, and has a high risk because the success rate of new medicine discovery cannot be predicted accurately. With the above problems, the research and development partnership with research institutes and universities

will be a solution for the national pharmaceutical companies to obtain new medicines that can enhance the competitiveness of the industry.

Innovation needs to be improved by the national pharmaceutical companies to improve the company performance, among them are as follows:

1. Processes innovation to increase production efficiency and capacity, which is done by optimizing the products storage. Innovation in the production process can be done by using automation process
2. The marketing innovation by improvement in the sales methods, can be conducted in partnership with the agency that have outlets spread throughout the strategic region.
3. The product innovations can be conducted by the national pharmaceutical companies by taking into account the needs and demands of society, such as disposable packaging or the use of plastic bottles are more practical if taken away.

To improve the competitiveness of the national pharmaceutical companies the research and development partnership should be increased that includes:

1. Transfer of technology to accelerate the ability of national pharmaceutical companies to get new products, but the technology transfer partnership is only for the short term.
2. Long-term by cooperating in the new product research with research institutes and universities to accelerate time to market.
3. The new product research partnership is necessary to anticipate the evolving patterns of disease, so that when an epidemic, the medicine required is readily produced by the national pharmaceutical companies.

REFERENCES

Aaker, D.A, 2004, Brand Portfolio Strategy, The Free Press, New York.

Ahmed, PK, and Sheperd, 2010, Innovation Management, Context, Strategies, Systems, and Processes, Pearson Education Ltd, Harlow.

Ariana, L., Prihadyanti D., Hartiningsih, Maulana I., Alamsyah P., 2014, Technological Catch Up Industri Farmasi Indonesia, LIPI Press

Balaseragam, Manica, 2015, A Global Biomedical R&D Fund and Mechanism for Innovations of Public Health Importance, PLOS Medicine journal,

Collis, David and Montgomery, Cythia, 2005, Corporate Strategy, A Resource based Approach, 2nd Edition, Mc Graw Hill International,

Freitas, I.M, Marques, R.A, and Silva, EM, 2013, University-Industry collaboration and innovation in emergent and Mature Industries in New Industrialized Countries, Elsevier, Research Policy Journal.

Harris, L.C., and Ogbonna, E, 2001, Strategic Human Resource Management, Market Orientation and Organizational Performance, *Journal of Business Research, Vol 17, No.1.*

Jouini, Sihem Ben Mahmoud, and Midler, Christopher, 2004; Time-to-market vs.

- time-to-delivery, Managing speed in Engineering, Procurement and Construction projects, *International Journal of Project Management*
- Kahn, Kenneth B., 2013, The PDMA Handbook of New Product Development, 3rd edition, John Wiley & Sons, Inc. USA
- Kaplan, Robert S, and David Norton, 2004, Strategy Maps, Harvard Business School Publishing Corp.
- Lavery, K.J, 2001, Market share, profits and business strategy , *Management Decision*; vol 39, 8; ABI/INFORM
- Lynn, Leonard and Salzman, Hal, 2006, Collaborative Advantage, *Issue in Science and Technology Journal*
- Manzano, J Aldas, Kuster, Ine, and Natalia Vila, 2005, Market Orientation and Innovation; an intern relationship analysis, *European Journal of Innovation Management*., Vol 8.
- Marcus, Alfred A, 2005, Management Strategy, Achieving Sustained Competitive Advantage, McGraw Hill,.
- Pagliusi S, Roestan R., Huang W., Nguyen T., 2014, Better Vaccines for healthier life, Conference Report on the DCVMN International Annual General Meeting, Hanoi, Vietnam, *Vaccine 32*
- Roberts, E., 2001 Benchmarking Global Strategic Management of Technology, *Research Technology Management*,
- Schilling, Melissa A, 2005, Strategic Management of Technological Innovation, Mc Graw Hill,
- Tidd, J, Bessant, and K. Pavitt, 2005, Managing Innovation , Integrating, Technological, Market and Organization Change, John Wiley & Son, Ltd, West Sussex.
- Tidd, J, 2001, Innovation Management in context : environment, organization and performance, *International Journal of Management Review*, 3.
- Walker, Boyd, and Larreche, 2003, Marketing Strategy ; Planning and Implementation, fourth ed, Homewood, IL, Irwin / Mc Graw Hill.
- Walker, Gordon, 2009, Modern Competitive Strategy, McGraw Hill,
- Wheelen, and Hunger, 2010, Strategic Management and Business Policy, 12th edition, Pearson Education.
- Wonglimpiyarat, Jarunee, 2004. The Use of Strategies in Managing Technological Innovation, *European Journal of Innovation*
- WHO, UNICEF, 2010; *Global Immunization Vision and Strategy, 2010 – 2014*