

Development of Indonesia Halal Agroindustry Global Market in ASEAN: Strategic Assesment

Fajar Surya Ari Anggara

Department of Management, Faculty of Economics and Management
Sciences, University of Darussalam Gontor

Email: masfajarsurya@gmail.com

Abstract

With the opening of AEC at the end of 2015, ASEAN became one of the largest markets in the world with a population of 633 million. Agroindustry is one of the most important sectors in ASEAN for Global Halal Market. Therefore, Indonesia needs to identify other segments or industries that can re-energize halal agroindustry of the country. This paper discusses the overlooked halal food segment in Indonesia as a catalyst in developing other potential sectors, in line with rapid globalization and internationalization. Using content analysis from various literatures, this exploratory study focuses on the past and current situation of halal food segment, and how its development can potentially affect growing sectors such as tourism and education in Indonesia. A SWOT analysis was conducted to summarize the country's internal (strengths and weaknesses) and external (opportunities and threats) issues in branding itself.

Keywords: *halal agroindustry; global market; strategic assesment*

A. INTRODUCTION

The halal market has for many years not been widely mapped. In terms of market research, trade data and analysis, and the preferences and spending habits of 1.6 billion consumers, the halal market is still very young, it continues to expand the commercial and industrial arena. While halal markets are spread across countries and cultures, when viewed as a single collective market of US \$ 137 trillion, halal products are larger than China (US \$ 857 billion), the United States (US \$ 768 billion), Japan (US \$ 445 billion) And India (US \$ 434 billion). A very significant halal market that can not be ignored. In addition, the world's Muslim youth population of 60% with a percentage below the age of 30 indicates that demand for halal products and services is likely to increase and become an increasingly influential market in the next decade. Currently, demand for halal products is certified not only in Muslim countries, even non-Muslim majority countries such as America, Japan and Korea have increasing demand for halal products. The emphasis on the importance of halal products is now growing. The Muslim population comprises 1.7 billion people by 2014 and is expected to increase to 2.2 billion by 2030. The total Muslim population continues to grow at 1.5 percent annually, which is roughly double the rate of growth of non-Muslim populations (Thomson Reuters, 2014).

The word "halal" literally means permissible. The Qur'an has many commands that instruct Muslims to consume only halal food (Al-Qaradawi, 2007). As a product characteristic, kosher refers to the nature, origin and method of processing food, which requires similarities with organic food or food produced considering animal welfare issues or sustainability. Halal is no longer purely a matter of religion even growing in the realm of business and commerce and it is becoming a global symbol for quality assurance as well as lifestyle choices. The presence of halal and Tayyib ensure that halal food is safe and healthy. (Muhammad, 2007; Hassan, 2011). Halal products in accordance with sharia, which does not involve the use of illicit materials (prohibited), the use of labor or environment that is not contrary to sharia. The current halal domain is developing through certification and assurance of all consumables such as bathing, medicine, cosmetics and services including financial services (Hanzaee dan Ramezani, 2011).

Global halal trade continues to grow. A global market based on an estimated 1.6 billion Muslims worldwide has emerged as a strong commercial arena. This creates opportunities for companies, especially

in developing markets to take profits in this market and is estimated to be worth US \$ 1 trillion from the halal food sector. This sector is increasingly attracting the attention of policymakers (government) and the private sector (business) as a high potential sector. (International Trade Centre, 2015). The level of economic development of nations depends on their ability in the political, national and economic aspects of the adjustment and utilization of the globalization process. Therefore the precise identification of the globalization process and proper oversight of this trend is required in many countries especially among developing countries that have entered into the situation (Safari dan Asgharizadeh, 2008).

One problem faced by Indonesia in the agricultural industry sector is the lack of access and control of agricultural technology. Apriantono (2006) said that information technology and access to farmers' markets is still weak. Expectations of farmers and agricultural industry players expect that all college graduates as innovation centers have technological transfer capabilities that can be directly applied in economic improvement activities from the agricultural industry sector.

The development of halal agro-industry in Indonesia is balanced with Indonesia's economic competitiveness on a global scale. The World Economic Forum defines competitiveness as a set of institutions, policies, and factors that determine the level of productivity of a country. The level of productivity will determine the level of prosperity that can be achieved with the economy. The level of productivity also determines the rate of return on investment in the economy, which will be a key driver of growth rates. In other words, a more competitive economy is likely to grow faster over time. (World Economic Forum, 2014)

The role of Innovation in economic activity is illustrated by Total Factor Productivity (TFP). The value of TFP Indonesia among Asean countries is below Singapore, Malaysia and Thailand. TFP is defined as the portion of output that can not be explained by the number of inputs used in production. TFP is a common indicator used to measure productivity, which includes differences in technology, organization, restructuring, and managerial skills (Zulkarnaen, 2011). The agricultural sector as a unified whole consists of three interrelated generations. The output of a generation of agriculture become the next generation of agricultural input. Inter-generation has a relationship of purchase, procurement, marketing, and distribution. Illustration of the whole farming system as in this following figure (Djamaran, 2004).

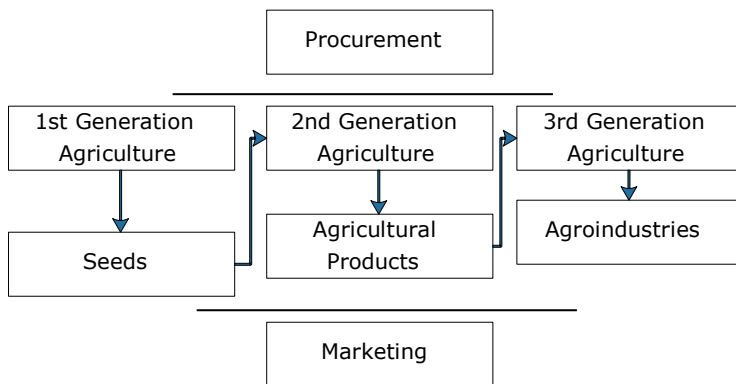


Figure 1. Agroindustry Full System (Djamaran, 2004)

Halal industry in Indonesia has become one of the most competitive industrial flows and has promising business industry prospects. Factors Internal social and political forces in Indonesia with the world's largest Muslim population, issued mandatory halal certification for domestic producers and producers. The certification will be conducted by the Halal Certification Board of Products with control by the Indonesian Ulema Council. The halal sector is growing rapidly. The consumer base for halal products is about 1.7 billion people and worth more than 2.3 trillion dollars in the global market so this is very important and should not be ignored (Razak et al, 2015).

Halal agroindustry is supported by the guarantee of products, processes and systems certified by authorized institutions in this case are MUI and LPPOM MUI for food and medicine. Agroindustry, an industry that processes primary agricultural commodities into processed products, both semi-finished and final products to post-harvest handling, food and beverage processing industry, biofarma industry, bio energy industry, processed processing industry, agroindustry, and agribusiness subsystem Which consists of Upstream Agribusiness Sub-Sitem, Sub-System of Farming Processing, Sub Processing System, Sub System of Marketing, and Sub Supporting System which is integrated (Arifin, 2004) .It is an important concern in the industry's halal guarantee. Due to the effort of strategic planning of strategic halal agroindustry of Indonesia in positioning as center of Halal Agroindustry in Global Market.

1. Halal Agroindustry Market in Indonesia

The growth of the global halal industry market is supported by 57 member countries majority of whom have Muslim population in OIC (Organization for Islamic Cooperation) has GDP (current) in 2013 of \$ 6.7 trillion. It is estimated that the flow of halal industry will grow faster than global economic growth. The OIC market growth projection in 2015-2019 is expected to be better with an average of 5.4% compared to the rest of world GDP growth, averaging 3.6% (based on IMF estimates).

Table 1. World Muslim Population, 2014

Area of Population	People (million)	Muslim Percentage	Muslim Population 2014 (million)
Africa	1096.6	53.04 %	581.58
Asia	4319.96	32.16 %	1389.5
Europe	739.31	7.6 %	56.18
North America	469.1	1.8 %	8.04
South America	488.5	0.42 %	2.07
Oceania	38.04	0.67 %	1.77
Total	7151.51	28.26 %	2038.04

Source: muslimpopulation.com

The Asian continent has the world's largest Muslim population. Indonesia has a total population of 218.68 million Muslims, the second largest Muslim population in the world after India with a total population of 255.30 million Muslims in 2014. Indonesia, Thailand, Singapore, Brunei, Malaysia, the Philippines and China are projected to play a role Important in moving the halal market in the momentum of the ASEAN Economic Community. The world's Muslim population is expected to increase from 1.7 billion in 2014 to 2.2 billion by 2030, an increase of 26.4%. The Pew Reseachr Center study further states that in the next two decades the growth of the Muslim population shows an upward trend of 1.5% and non-Muslim population growth of 0.7%. The study results show the median age of the productive age and the 30-year-old majority by 2030. By 2030 the Muslim youth population is 29% between the ages of 15-29 years (Pew Research Center on Religion & Public Life, 2015). This has a major impact on the rapid growth of the global halal market in the future.

Global halal market is supported by universal consumption

behavior. Islam as the way of life, the way of life for Muslims touches all aspects including consumption behavior. Consumption behavior includes halal food and hygiene as well as nutritional integrity (without defects), family values, simplicity and courtesy in appearance, safe financial transactions. This consumption behavior touches on many aspects such as food and catering industry, financial system, tourism, fashion appearance, education service, charity service, individual daily needs service, and support of halal industrial infrastructure. This is a universal appeal because it is in accordance with ethical, environmentally friendly, safe, well-maintained nutritional value, clean, so that in the future halal products are not exclusively positioned for Muslims alone but universally as a result of the appeal of consumption behavior.

The FMCG (Fast Moving Consumer Goods) marketplace is a market niche of products that have turnover turnover quickly and relatively low cost but have a relatively short shelf life due to its perishable nature. The global halal market is potentially worth 2.3 trillion USD which consists of 67% of FMCG and 33% non FMCG. The FMCG industry includes 35% food and beverage categories, 12% bakery categories, 9% cosmetics and body care categories, 5% confectionary categories, and 6% nutrition supplement categories. Non FMCG covers 10% raw meat category, 23% pharmaceutical category (Euromonitor, 2013). OIC countries are very much taking a role in driving the global halal market that is integrated as a supplier and consumer as well as provider and seeker of foreign investment for halal industry. Global company linkage to focus into halal industry on consumer products such as the retail company FMCG (Nestle, Carrefour) and not only participate but also play a major role in the development of large-scale halal industry. This shows that the halal industry in the future has an increasing credibility to the global market in terms of fulfilling consumer needs so that the halal industry is of particular concern to the financial institutions and banks (Deutsche Bank, HSBC, Citi, MasterCard) to synergize in business and investment networks.

This global Halal Industrial Market has triggered special attention for halal industry players, especially in Indonesia. Indonesia has the potential to become a major force in the world's economy and industry. Indonesia is the largest producer of palm oil, rice, cocoa, coffee, rubber, copper, tin, nickel and other agricultural and marine resources so that the agricultural sector plays an important role in supporting Indonesia's economic competitiveness. World Economic

Forum predicts per capita income of Indonesia's population later in the year 2045 will reach US 44,500 s-d 49,000. Factor factors that greatly affect is the updating of business and innovation through research, technology, and development. Higher Education should be able to play the role as an innovative human resource producer, and able to improve the competitiveness and welfare of the community. Community expectation that all college graduates are able to transform into be cultured, knowledgeable and most importantly have technology transfer capability that can be directly applied in economic improvement activity of society. Problems with basic research issues should be solved by "*transferring culture knowledge technology to society and industry*" (Prasetyono, 2016). Halal industry includes cultural values, knowledge, technology utilization in sharia law guidance and ensures the halal of goods and service products will reach the society and between industries. The development of halal industry in Indonesia is supported by Indonesia's economic competitiveness that needs to be improved.

Indonesian industry which is currently driven by efficiency factor. The World Economic Forum states that the country with the largest economy in Southeast Asia continues to show progress in overall ratings, rising 4 from 38th place to 34th. The World Economic Forum predicts progress in this competitiveness contributing to ensuring the sustainability of GDP growth will grow 5.8% annually since 2004. Gross Domestic Product (GDP) is the market value of all goods and services produced by a country At a certain period. However, the GDP growth momentum is in fact unlike the estimate. The World Economic Forum also stated that Indonesia's overall performance in this index is not balanced. Infrastructure sector and connectivity Indonesia continues to rise in rank, up five ranks compared to last year. The quality of public and private governance of the country is also strong. Indonesia rose 14 ranks to rank 53 because of improvements in 18 of the 21 indicators that make up this pillar. Indonesia ranks 36th for Government efficiency. Turning to innovation-driven competitiveness factors, Indonesia's technological readiness is behind (rank 77). The use of information and communication technology by the population is generally low compared to other countries (ranked 94, down 10 ratings). Indonesia ranks 45th if it is judged by the basic factors driving the economy; Ranks 52th from efficiency drivers, while Indonesia ranks 33th from innovations in the economy. Therefore, the most need to be improved for Indonesia are

the pillars of higher education and training, market efficiency, market size, labor market efficiency, financial market development, technological readiness, innovation, business sophistication, and business convenience.

Table 2. Comparing Indonesia – Malaysia Competitiveness

Competitiveness Factor	Indonesia		Malaysia	
	Rank	Score	Rank	Score
Basic needs	49	4.8	22	5.6
Pillar 1: Institution	55	4.1	23	5.1
Pillar 2: Infrastructure	62	4.2	24	5.5
Pillar 3: The macroeconomic environment	33	5.5	35	5.4
Pillar 4: Basic health and education	80	5.6	24	6.3
Driving factor efficiency	46	4.3	22	5.0
Factor 5: Higher education and training	65	4.5	36	5.0
Factor 6: Efficiency of the goods market	55	4.4	6	5.4
Factor 7: Labor efficiency	115	3.7	19	4.9
Factor 8: Development of financial markets	49	4.2	9	5.2
Factor 9: Technology readiness	85	3.5	47	4.6
Factor 10: Market Size	10	5.7	26	5.0
Sophistication and Innovation	33	4.1	17	5.1
Factor 11: business update	36	4.3	13	5.3
Factor 12: Innovation	30	3.9	20	4.8

Source: WEF Report (2015)

Indonesia still has a challenge in developing the halal industry through inter-state cooperation that is related to business convenience. World Bank describes the important role of government policy in the daily activities of business enterprises. The purpose of this report is to encourage governments to issue policies and regulations to be made more efficient so that they can be accessed by those concerned and easily implemented (World Bank, 2015). It is hoped that the role of government collaboration, business practitioners of halal agroindustry,

and inter society both domestic and abroad can focus on the development of halal agroindustry will be able to run its business by Al Tijārah

competing fairly and able to develop themselves by innovating. This needs to be taken seriously as the potential of Indonesian agro-industry will be hampered if the business amenity factor is still the main problem. Indonesia only occupies 114 rankings on the world level in the ease of doing business, lagging far behind the countries around it. Singapore is ranked 1st, Malaysia 18, Thailand 26, Vietnam 78, Philippines 95 and Brunei 101. Halal Industry to stimulate the economy through exports, tourism, value-add, trade, research. Thailand stimulate through Halal Science Centre, Halal Science Symposium, Governmentt initiatives, Southern Thailand Area of Halal Industry, and IMT-GT programmes. Philippines stimulate through BIMP initiative, New Certification Authority, and Mindanao development. Indonesia stimulate through MUI Halal authority, Largest Muslim population, Raw material source, and Huge consumer market. Singapore stimulate through Certification expertise, MUIS authority, Value-add, trade. Malaysia stimulate through Standards & Certification, MIHAS expo, World Halal Forum, HDC programmes, Media focus (HJ, HJTV), and Centres of Halal Excellence. This illustrates how easy it is to run a business of halal agro-industry in Indonesia. There are many obstacles and obstacles faced by an investor. For example, to start a halal agro-industry in Indonesia. While in other countries, incoming investors are given many conveniences to want to run a business in their country. Easy, cheap and fast bureaucracy is an attraction for entrepreneurs to open a business in a country. Something that is still difficult to find in this country so that ease of business oriented with ease, affordable, and fast through business update and innovation become the attraction of stakeholders to start and develop the halal farm industry.

In addition to the business convenience factor in halal agro-industry, other efforts are needed to encourage the economy and attractiveness of the halal industrial sector of Indonesia. It is necessary to seek the support of innovative industries and the need for business sophistication and innovation pillars. Industry updating involves two closely related elements: the overall quality of the industry network and the operating quality of a corporate strategy. The quality of industrial networks is measured by the quantity and quality of local suppliers and the extent to which their interactions between industry, community, and government lines. When industries and suppliers from a sector are interconnected in an area then a greater opportunity for innovation in the process and its products.

Although Indonesia's halal agroindustry has a huge opportunity

but the global challenge in the future is in the supply chain of halal agro-industry especially in halal food. The Food and Agriculture Organization (FAO) of the United Nations projected food demand would increase by 70-100 percent by 2050 for a human projection of 9.1 billion million people in Indonesia. Data on agro-industry production growth in the last 10 years is slightly lower at 1.7% from the previous 10 years growth of 2.6% in the period of 1990-2000. On the other hand, the price of goods products, especially from the agro-industry sector, is increasing every year and is not matched by the significant increase of GDP in most countries in the world, triggering the potential of imbalance of supply chain of agroindustry products in every low- and middle-income countries with potential to poverty of 44 million people. This is supported by the FAO data which says that 60% of nutritional humans live in Asia, as we know Asia as the continent with the largest Muslim population in the world. This supply chain that needs to be focused on developing, innovating, and updating halal agro-industry. Real examples for halal industrial agriculture products include fresh meat and poultry, frozen and processed products, meat and poultry ingredients, dairy products and ingredients, fast food and food, all other packaged food products, cosmetics and personal care products, Nutritional and dietary supplements, and packaging materials will be difficult to obtain for low- and middle-income countries.

Strengths	Opportunities
<ul style="list-style-type: none"> ▪ Demographic factors and the largest Muslim population among other countries as a driver of halal agro-industry ▪ Diversification of halal agroindustry products and potential as a center of diversification of halal agro-industry products ▪ Young entrepreneurs and start-ups are beginning to be interested in entering the halal agro-industry sector ▪ More developing countries 	<ul style="list-style-type: none"> ▪ Creation of policy framework and protection of halal agro-industrial product guarantee ▪ Investment opportunities in various lines of halal certified agro-industry ▪ Marketing based on 'Tayyib' and ethical in practical halal agro-industry ▪ The largest Muslim population among other countries accounts for a large percentage of the world's halal market ▪ Vertical integration to ensure halal supply chain of halal agro-industry

<p>in awareness campaigns against the halal industry</p> <ul style="list-style-type: none"> ▪ Halal food is becoming acceptable in non-Muslim majority countries and potentially a global consumption trend ▪ Various agencies and institutions of higher learning have the potential to be the center of innovation and updating of halal agro-industry. 	<ul style="list-style-type: none"> ▪ Scientific research is more focused on the benefits of halal food and halal agro-industry ▪ Access the global market through an online platform integrated halal network ▪ Provide accurate and well-researched market data of halal agroindustry ▪ Incubation of SMEs & start-up of halal agro-industry
<p style="text-align: center;">Weaknesses</p> <ul style="list-style-type: none"> ▪ Lack of vanguard of influence in coordinating halal agro-industry ▪ Lack of funds for business updating and innovation of start-up development and SMEs of halal agro-industry ▪ Inadequate training development programs and insufficient human resources on insights into halal agro-industry ▪ Weaknesses that are still shared among countries of the Organization of Islamic Cooperation 	<p style="text-align: center;">Threats</p> <ul style="list-style-type: none"> ▪ The threat of social upheaval stemming from cultural differences in the upstream and downstream halal agro-industrial areas ▪ SARA issue is very sensitive in the area of halal agro-industry ▪ Islamophobic Issues, the use of halal products indirectly supports terrorists ▪ Scandals caused by poor management and non-systematic operational methods

Figure 2. Halal Agroindustry SWOT (data analyzed, 2016)

Intpretation of SWOT analysis of halal agroindustry shows that the main potential supporting the halal agro-industry includes the rapidly growing Muslim population, diversification of certified halal agro-industry products, and the great attention from universities to agencies related to the development of halal agro-industry. Demographic factors and the largest Muslim population among other

countries as a driver of halal agro-industry. Great opportunities in the development of halal agro-industry through the support of the rapid

growth of the world's Muslim population as a world halal market, policy makers' attitude to fast and responsive to issues related to halal products by adopting vertically integrated steps, and interest of academics, researchers, institutions to contribute actively in Development of halal product supervision.

Nevertheless, there is still something that needs to be given special attention in halal agro-industry. Interpretation of SWOT analysis of halal agroindustry shows that there are still false halal logos in product, business update and agro-industry innovation are still rare, as well as inadequate development and training to support the development of halal agro-industry. Lack of funding for business updating and innovation of start-up development and SMEs of halal agro-industry. Inadequate training development programs and insufficient human resources on insights into halal agro-industry. Fraud in the presence of fake halal logos, socio-economic upheaval, and the existence of operational oversight of non-procedural procedures should be anticipated in the development of agro-industries.

Halal a global market force including Meat & Poultry, Food Manufacturing, Food Retailing, Restaurant Chains, Food Service Industry, Logistics & Shipping, Islamic Banking & Finance, Standards, Auditing, Certification, Science & new technologies, Personal care products, 2 billion 'de facto' consumers, USD 500 billion annually, and Expanding market parameters.

Various countries have large numbers of Muslim populations, especially in ASEAN such as Malaysia, Thailand, Singapore, the Philippines and countries with few Muslim populations such as Korea, Japan, Taiwan are interested to compete for the world's halal market. This becomes Indonesia's challenge from the various roles of halal agro-industry practitioners, government, academia to community communities to take advantage of the growth of the world's halal market. These four roles play a major role in the development of planned, measurable, structured, systematic, and targeted halal agroindustry to prepare halal products that can be absorbed in meeting the increasing need for halal products. Efforts to develop global halal products and markets one of which is done by building a network of cooperation in the country and between countries in the form of Global Halal-Hub.

CONCLUSION

Halal Agroindustry is a potential and an opportunity for Indonesia. Halal agroindustry has enormous business value and

competitiveness and prospective, but the role of Indonesia as a country with the most Muslim population is still very low in the world halal market, especially in the export of halal agro-industrial products. The role of academics, community, government and all halal agroindustry businessmen is expected to pay more attention to the superior value of halal agro-industry sector to increase business capacity to competitiveness in global market as well as people protection and focus on innovation factor of halal agro industry in global market. This exploratory study gives some insights on the background and potential of Indonesian Halal Agroindustry Market development in ASEAN. However, novel effort is necessary to heighten the interest and correct understanding on halal. Then how halal can become a niche sector that can support and promote the much-emphasized education and tourism industry. Likewise, more research work should be taken up to fill gaps in the knowledge of halal market development in Indonesia.

BIBLIOGRAPHY

- Agriculture and Agri- Food Canada. (2011). *Global Halal food Market*. Available at <http://www.ats.agr.gc.ca/inter/4352-eng.pdf>. Retrieved July 12, 2012.
- Brian J.G. et al. (2011). *The future of the global Muslim population: projections for 2010-2030*. Washington D.C. PEW Research Center.
- Djamaran, I. (2004). *Strategi Pembangunan Agroindustri*. Bahan Kuliah SPS IPB. Bogor.
- Hanzaee, Kambiz Heidarzadeh dan Mohammad Reza Ramezani. (2011). Intention to Halal Products In The World Markets. *Interdisciplinary Journal of Research in Business*. 1(5).
- Hassan, S.H. (2011). Consumption of functional food model for Malay Muslims in Malaysia. *Journal of Islamic Marketing*. 2(2), 104-124.
- Hofstede, G. (2001). *Culture's Consequences, Comparing Values, Behaviours, Institutions and Organizations Across Nations*. 2nd ed. London: Sage.
- International Trade Centre. (2015). *From niche to mainstream Halal Goes Global*. Geneva. [internet]. [Accessed at August 19, 2016].

- Kementrian Pertanian. (2016). *Rencana Strategis Kementerian Pertanian 2015-2019*. [Internet]. www.pertanian.go.id/file/RENSTRA_2015-2019.pdf [Accessed at 19 August, 2016].
- Muhammad, R. (2007). Re-branding Halal. *The Halal Journal*. 32, 32-34.
- Porter, M.E. (1996). What is a strategy? *Harvard Business Review*. 74(6), 61-78.
- Quinn, J. B., Baruch, J., & Zien, K. A. (1996). Software-based Innovation. *Sloan Management Review*. 37(4), 11–24.
- Quinn, R.E. (1998). *Beyond Rational Management: Mastering the Paradoxes and Competing Demands of High Performance*. California: Jossey-Bass Inc.
- Razak, et al. (2015). Overview of Halal Products and Services in Malaysia and Global Market. *International Journal of Economics, Commerce and Management*. 3(3).
- Safari, H. dan Asgharizadeh, E. (2008). Measuring Competitive Capacity of the National Petrochemical Company with Bayesian networks. *Journal of Industrial Management*. 1(1).
- Setyono, Agus P. (2016). *IPTEK Menuju Tingkat Kesiapan Inovasi Indonesia* [internet]. [accessed on 19 Agustus 2016]. Link: <http://www.dikti.go.id/iptek-menuju-tingkat-kesiapan-inovasi-indonesia/>
- Thomson Reuters. (2014). *State of the Global Islamic Economy 2014-2015 Report*. May. Available at: <http://halalfocus.net/wp-content/uploads/2015/01/SGIE-Report-2014.pdf>
- World Bank. (2015). *Doing Business 2015*. Available at www.doingbusiness.org/rankings
- World Economic Forum. (2014). *The Global Competitiveness Report 2014-2015*. Available at: http://www.weforum.org/pdf/Global_Competitiveness_Reports/Reports/factsheet_gcr03.pdf
- Zulkarnaen. (2011). *Total Factor Productivity*. <http://zkynzulqarnaen.blogspot.com/2012/04/Total-factor-productivity-tfp.html>. Accessed at August 19, 2016.