Higher education and economic sove-reignity based on triple helix

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ECONOMIC SOVEREIGNITY BASED ON TRIPLE HELIX

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Abstract

This paper aims to encourage Indonesian economic sovereignty and independence through synergy between knowledge institutions and universities with industries in which the role of government as intermediation. Innovation is a major factor to support quality of economic growth. Indonesia has begun to understand this by created various research schemes. Various research schemes are expected to encourage the growth of innovation needed to develop industry and economy. Further hope is economic sovereignty based on innovation and knowledge. Generally, relationship between government with universities have been very good in order to strengthen research and support Research University. This is reflected in the many research schemes offered by the government to universities and research institutes. Unfotunately, the relationship between universities and big industries and small and medium scale industries is still relatively weak. This relationship should be strengthened in order to strengthen Indonesia's economic sovereignty. This paper explains some efforts that have been in building strong relationships between government, university and industry in triple helix concept to realize economic sovereignty.

Background

Global Competitiveness Report has released Indonesia's competitiveness rating. The release results showed that Indonesia's competitiveness is ranked 41st, which is lower than Singapore, Malaysia and Thailand. The position shows better competitiveness from 2012 to below but lower than 2013 to 2015. The decline in the last 3-4 years shows that competition in the field of innovation is increasingly opened. The economic sector showed quite high economic growth, about 5%, but the problem of inequality still seems to be a big challenge for the Indonesian government. Furthermore, the index of gini ratio is quite high because its value reaches 0.39 - 0.4. It can be expected that government support in strengthening innovation-based economies still has constraints.

Some research indicated that the level of government involvement has not provided much support for innovation and sustainable growth. Therefore, the need for governance and regulation introduces the intermediation concept in the

innovation process. Thus it is important that intermediation between governments, industries and universities is widely related to public, private and other institutions (Todeva 2013).

This shows that innovation and intermediation cooperation between universities, industry and government has a very important role in improving the quality of economic growth. Relationships between research institutions and universities with industry can support each other in strengthening knowledge-based economic development. Furthermore, the role of the government can be as a mediator and regulatory controller and to approach a certain scale of research to clarify the development of home, small and medium industries. The development and growth of small economic activities can minimize the income inequality spaces and promote more inclusive economic growth.

Todevo (2013) stated that intermediation is government as a factor of normative control, and educational institutions as an innovation factor, especially related to the creation of knowledge and dissemination. Furthermore, industry as a production factor associated with multi-national cooperation, firm and private sector. Practical intermediation between universities and industry is the government's effort to support the transfer of knowledge and technology between universities and industry. The government provides strong legitimacy for universities to improve innovation performance. Furthermore, the university produces a creation of technological innovation for supporting the industry. Thus the government conducts the political process through regulation, while the university innovates the process by finding newness in production technology and the industry creates market processes to support the creation of social welfare.

However, it appears that the role of government intermediation has not fully functioned well in Indonesia. Much of the research still depends on national income through various schemes. These schemes include Incentives of National Innovation Research (called INSINAS), Indonesian Science Fund (called DIPI), Basic to Strategic Research Scheme (called SIMLITABMAS). Furthermore, the university utilizes the scheme to conduct research within a certain period of time. It showed that the research relationship is very strong between the government and industry but the relationship between universities and industry seems still weak. Furthermore, university relationships with household, small and medium enterprises are still not visible.

This situation has more influence on research that is less relevant to industry needs but more influenced by individual research in educational institutions. The positive implication is that the number of scientific publications increased in number to 11,865 in 2016 and 12,193 in 2017. These improvements have had an impact on university development but have not had an impact on industry and economic sovereignty.

Therefore, the government needs to make a formulation to strengthen the relationship between the university and industry. The role of government intermediation is expected to provide value benefits through communication, cooperation, support, negotiation and equal bargaining between organizations, especially in relation with government, industry and education. The role of government intermediation also can be expanded by enforcing regulations that support synergism between educational institutions and industry. The government give more attention to research that create innovations that add value to the industry. On the other hand, the added value the industry gains can help the government in overcoming the labor market and unemployment. Government-initiated intermediation is a strategic step to pursue close, synergic, sustainable, mutually beneficial cooperation for educational and industrial institutions (Todevo 2013).

Thus, the triple helix structure has systems that are interconnected with one another; (1) components, (2) relationship and (3) function. The triple helix component covers the performance of various research and development institutions that are on the direct government, industry and community. The performance of research and development institutions needs to be supported by marketing, technology adoption, a combination of knowledge in new ways and production. Generally, research and development are managed with innovation and management (actors). As perfection of management innovation with education and dedication must be supported by hybrid institutions, that is with sitensis between elements of education, industry and government. It can be realized with a research consortium between industry and university, interdisciplinary research center support, corporate support with government laboratories, business support institutions and the presence of institutions for finance and technology-based companies (Etzkowitz and Ranga 2012).

Relationship functions relate to how to build triadic relationships by collaboration, conflict modernization and substitution patterns. This collaboration emphasizes the provision of research and development, the formation of new or consolidated markets, incubation activities, transfer of technology, financing and negotiation. Substitution is related to the expansion of the role of every institution whether government, university, and industry. The role of the university does not only run educational and research activities but needs to provide support and encouragement of entrepreneurial ventures. This means that the university is undertaking the traditional substitution role of the industry. On the other hand, industry takes on the role of universities by conducting research in laboratories and training, while the role of government is to try to formulate regulations that can accelerate the development of science and industry. As an example of how a university tries to build an entrepreneurial network, especially with small and medium enterprise companies and vocational training. Further encouraging partnerships with state-owned enterprises and professional associations (Etzkowitz and Ranga, 2010).

The triple helix system should be able to see the difference between (1) R & D and Non-R & D, (2) 'single-sphere' and 'multi-sphere' institutions and (3) innovators derived from individuals and institutions. Furthermore, it is associated with 5 main types of relationships namely technology transfer, collaboration and moderate conflict, collaborative leadership, substitution and networking. The triple helix system accommodates individual and institutional roles in an innovation and explains the various innovation performance with development and articulation relationships with knowledge, innovation and consensus space (Ranga and Etzkowitz, 2013).

There are three main perspectives on the configuration of relationships between universities, industry and government agencies. The three perspectives are (1) statist configuration, (2) laissez-faire configuration and (3) balanced configuration. Statist configuration where the government played a leading role in encouraging academia and industry. But, such configurations have limitations in developing innovative transformations. Laissez-faire configuration, limited state role, where industry as a driving force is accompanied by government and university support. University as a provider of human and government resources as regulator of regulation. A balanced configuration emphasized equal partnerships between universities and knowledge institutions with industry. While the government leads a joint intermediation (Etzkowitz and Leydesdorff, 2000).

Based on the above, then the configuration of the relationship between the university, industry and government agencies should be balanced configuration. The government must build strong relationships between universities and industry through regulation. The Government acts as an intermediary in encouraging research to support industry needs. In contrast, research funding support not only comes from the government but the industry must have a large contribution in supporting industry-based research. This will promote an inclusive economic strengthening and strengthen economic sovereignty. That is because independence in the bindang industry innovation can strengthen the national industry through independent research. Furthermore, economic fundamentals are getting stronger because the source of industry innovation can be provided independently. Problems of inequality will also be resolved if institutional innovation is aligned with the needs of household, small and medium scale industries.

Triple Helix and Entrepreneurship

Cummings (1994) states that in ASIAN country did not have a long history related to research, but was able to build high technology industry in a short time. This is because development of economic is strongly based on science development. The Japanese state has given an example of how science and technology are mutually reinforcing with the economy. It also happened in korea where its economic development is based on industry-based technology innovation.

While the State of Saudi Arabia had laid out a long-term strategic plan to develop a scientific research base for the development of knowledge-based industries that is in harmony with the context and needs of Saudi Arabia. Furthermore Saudi Arabia pushes its human resources into Philoshophy of Doctoral (PhD) level. Initially the number of PhD who registered only 611 people in 2006 and increased twice in 2010 to 1334 students. Furthermore, the Saudi Arabian government and researchers create a better connection between knowledge and technological innovation. Policies and researchers consider how to generate knowledge relevant to the industry and how to relate the science of needs to the needs of industry and employment training (Shin and Lee 2012).

Universities should expand their teaching and research abilities to build an entrepreneurial education and incubation program. Furthermore, the Government needs to provide a more format of modern education and research by establishing an interdisciplinary and hybrid organization center. Containers from interdisciplinary centers and hybrid organizations are science parks, incubators and venture capital firms. Therefore, students need to be trained and encouraged to become entrepreneurs to take on the role of the founder of the company within the community. Furthermore, the important support of universities for entrepreneurs to be more developed is to develop and transfer technology (Etzkowitz and Ranga, 2010).

The concept of learning, knowledge and innovation has a strong relationship with government, industry and higher education. A good understanding of these three concepts can enhance entrepreneurship to maintain broad economic competitiveness. Therefore, the development of entrepreneurship that is directly related to education is (1) Attention to the key aspects influencing the development of small busines, (2) the utilization of research findings appropriately for the development of small and medium enterprises, (3) development of the generation for business and curriculum development .

Furthermore, there are three main keys that can encourage entrepreneurship development programs, namely (1) there should be research to detect more clearly the development of entrepreneurship value, (2) the conceptualization of entrepreneurship is implemented into education and training, and (3) the development of entrepreneurial activities through the development of management, training and business networks. (Matlay and Partners, 2002). Entrepreneurship is able to encourage economic growth and enhance economic competitiveness. One important part in creating entrepreneurship through the establishment of a new company is the availability of financial incentives. This implied that entrepreneurship can encourage economic strengthening and help companies bounce back from adversity. In the long term, development policy is to create better environmental conditions for local entrepreneurship and innovation by utilizing existing resources (Feldman and Francis, 2004).

Unfortunately, the number of entrepreneurs in Indonesia is still relatively small compared to other countries in southeast asia. While the large population and

the potential of natural resources available in large quantities should be supported by a large number of entrpreneurship. The existence of entrepreneurship can strengthen economic growth and sovereignty. Therefore, the government should encourage entrprneurship based on research-based industry innovation. If this relationship has a strong closeness then the economy could be better.

The Role of Triple Helix into Smart City Development

Developing countries like Indonesia have a variety of obstacles, especially those related to urban density, the comfort of urban residence and environment. Most of people rely on life in the city because of work and lifestyle alsan. Unfortunately in the cities where they live, socialize and work is not supported by social conditions, green open space, accessibility, pollution and environmental problems. This can be seen in several cities in Indonesia, especially Jakarta, has not been optimally supported by transportation system, green open space and environmental conditions. Therefore it is necessary to create a connection between the development of Smart City with the institutional Triple Helix. On the other hand, it is necessary to analyze several dimensions of urban environments to assess Smart City's performance benefits. Furthermore, Smart City's existence is correlated with Smart Government.

Information and communication technologies (ICTs) can help develop e-government services. This much gives the ease of Smart City inherently ICTs serve the community. Communities can be served with ease, cost efficiency and effectiveness. Smart City must be able to support social learning, entrepreneurial skills and knowledge transfer to support the development of regional innovation. The role of universities, industry and government needs to do creations for Smart City can be perceived benefits by the community. Some challenges to be considered are complex urban environments, where market demand, governance, community character, culture and social capital form the basis for establishing relationships between universities, industry and government (Lambordi et.al, 2011).

Etzkowitz and Zhou (2006) and Lombardi *et al* (2011b) explained that there are several components in building Smart City: (1) smart governance (related to community participation, (2) smart human capital (relating to human resources) 3) smart environment (related to natural resources), (4) smart living (related to comfort and quality of life) and smart economy (which is related to healthy and open competition). With these 4 main components become the basis for entrepreneurial building city, ease of logistics mobility and social participation.

Table 1. Relationship between various components in smart city development

Cluster	Smart Governence	Smart Economy	Smart Human	Smart Living	Smart Environment
University	The role of Universities and research center	Development of Start up and entrepreneurship generation	High participation in education is followed by community awareness	Involvement and financing in creating a good living environment	Designing a healthy city with air pollution, low waste, clean water available, green area
Government	Availability of e-government for public services	Better labor costs, lower unemployment rates	Availability of social interaction areas, city carrying capacity policy	Availabilty area of recreation, sport	Policy of green open space, and awareness of water use efficiency
Civil Society	Most of community used internet for getting public services	There many of community creativity	A part of community understand foreign language, computer, and internet	Historical sites, museum, land mark and art that many visited	High level of community environmental awareness
Industry	There are many research grants from companies, foundations and institutions	Using of high technologies, renewable energy, and culture of work that's good	The labours have ability of knowledge-intensive sectors	There are many internationally-based companies and industries that synergize with training institutions	The company already holds environmental and sustainable principles such as energy savings

Source : Lombardi et al (2011b) after modified

Based on the table that universities have a big role in developing ICTs. This will help the government in providing e-government. On the other hand, the community will be given easy access to public services quickly. Furthermore, it creates cost and time savings for civil society.

The existence of the university can also encourage the development of start up and raises a high awareness of the importance of education. The university is expanding its role in encouraging a clean city, away from pollution and creating a comfortable residential environment. Further development of startups will encourage economic growth, employment and increased wages of labours. While the industry will continue to utilize the innovation results of university institutions by using environmentally friendly energy. This illustrates that the creation of a city, government, economy, social, good environment depends on how the relationship between government, university and industry can be synergistic.

Kesimpulan

Generally, government relations with universities have been very good in order to strengthen research and support Research University. However, the relationship between universities and industries also small and medium scale

industries is still relatively weak. Furthermore, the university has a big role in building smart city. This also shows that university, industry and industry relationships still have weaknesses. Further demonstrating that the synergy of the university should take a strategic role in strengthening and generating greater amounts of entrepreneurship. Need some intermediation strategy in strengthening triple helix relationship in strengthening economic sovereignty, building entrepreneurship and smart city.

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