

# ON THE POSSIBILITY TO CREATE VALUABLE UNIVERSITY-INDUSTRY LINKAGES: CASE STUDY IN SOUTH SUMATERA

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## ABSTRACT

*This paper is based on conceptual analysis regarding the possibility to establish university-industry linkages that drive regional and local economic growth in South Sumatera. The university-industry linkage is part of the Innovation System, which in turn is the main element of the Masterplan for Acceleration and Expansion on Indonesia's Economic Development (MP3EI) initiative. In this paper we argue that, for the innovation system to be successful, it can not be implemented before the quality of its components is increased to a certain level. In general, research capability of university in South Sumatera is fairly low and the big enterprises operate mainly in agricultural, mining, oil/gas production, and process industry. These types of industry do not required as many auxillary/support industry or research and new product development as the manufacturing one. Therefore, capitalization of invention by research and development activities in the university will be beneficial for region outside South Sumatera. As a result, we question the likelihood of the innovation system to drive the local economic growth. However, the university-industry linkage similar to the one implemented in China in which enterprises (broadly defined) that are invested in and owned wholly by universities, operated and owned jointly with other entities, or invested in partially by universities conduct the commercialization of the research output will be a suitable model to drive economic growth in South Sumatera.*

**Keywords:** Innovation, Policy, South Sumatera, Economy, Growth

## 1. Introduction

Realizing that Indonesian economic growth has not been able to reached an advanced and sustainable state, Indonesian government took an initiative to accelerate and extend Indonesian economic development. This initiative is cast in a Masterplan for Acceleration and Expansion on Indonesia's Economic Development, known in Indonesian as (MP3EI). MP3EI is expected to bring Indonesia to become one of the major economy in the world with Gross Domestic Product (GDP) 4000 – 4500 billion USD. In order to achieve this the required real sector economic growth has to be 6.4 – 7.5% in the period 2011 – 2014 and 8.0 – 9.0% during 2015 – 2025. Growth at this level clearly can not be achieved by relying on labor-intensive invesment-driven production-based economy. Only through transformation into innovation-driven knowledge-based economy the objectives of MP3EI can be

achieved. Therefore, one of the main strategy adopted by the government is to strengthen national innovation system on the production, processes, and marketing to sustainably increase the global competitiveness towards innovation-driven economy (Kementerian Koordinator Bidang Perekonomian, 2011). Following the launch of MP3EI initiatives Indonesian government created Innovation Systems at the national level down to local level by forming Innovation Committee at each level.

Historically, attempts to boost the competitiveness of the nation is not new in Indonesia. In the era of Soekarno the attempts focused on establishing steel and military industries and providing scholarship for Indonesian students to study in mostly Eastern European Countries, such as Soviet Union, Chekoslovakia and East Germany. During Soeharto Era, lead by Prof. Dr. Ing. B.J. Habibie as Science and Technology Minister, several Strategic Industries and Public Research Centers were established and allocating large amount of funds for capacity building programmes. Unfortunately, all these strategic programmes both eras came to end prematurely with the regime changes. In addition, the 1997 economic crisis that trigger the regime change also cause the brain drain from those strategic industries to other developed countries. MP3EI can be considered as the third attempt by Indonesian Government to increase Indonesia global competitiveness.

Dramatic increase in government expenditure allocated for university research funding and capacity building and the formation of national and provincial innovation system clearly shows a shift in the model of innovation system adopted by the Indonesian Government. While in the Suharto era the main actors in the Indonesian Innovation System were public research institutions and state-own hi-tech enterprises, the current innovation system is rely on the interaction between university and private industry, more or less half of the state-own hi-tech enterprise have been privatize. What types of interaction and how university and industry interact are crucial in determining not only the success of the innovation system in producing new innovations and technologies, but also turn them into processes, products or services on the market[.].

In general, the purpose of this paper is to examine the readiness of the main actors in the Regional and Local Innovation system, namely local universities, industries/businesses and government, in particular the ones in South Sumatera, to become the main driver of a sustainable local economic growth. Special attention is directed toward the creation of valuable university-industry/business linkages as one of the bases of the innovation system.

## **2. University-Industry-Business Linkages in the context of Innovation System**

Most innovation systems are composed of industry, university or public research institution, and government as the main actors (Fujita & Hill, 2004). However, the relative importance of each actor and interaction between them are difference from system to system. Interaction between university

and industry or University-Industry-Business (UIB) linkage is often considered as the main driver of the success of many developed countries, in particular USA and Western European countries, in driving their economic growth (Wu, 2006). UIB linkage also has been considered as the key ingredient in transferring South Korea and China from a developing country into one of Most Industrialised Nations (). Recently this UIB linkage has been adopted by many developing countries such as Thailand, etc().

In the United States the combination of large funding allocated for research by federal government and policies that allow the transfer of publicly funded intellectual property to industrial firms have resulted in significant contribution of both public and private universities to technological development and industrial performance []. In continental Europe (with the exception of Germany) , on the other hand, university faculty in some country was prohibited from collaborating with commercial firms. The academic culture of European universities emphasized their research activities on fundamental ones. However, since the late of 1980s attention has shifted to technology policy supporting commercialization and technology transfer (Pogayo-theotoky, Beath & Siegel, 2002). Prior to 1990s, the Japanese model large industrial firms tend to integrate the process of innovation – from basic research to commercialization – within one organizational framework (). Thus the Japanese innovation system place the private firms on the central role while universities mainly focused on providing qualified human capital for government and industry and engaged in informal research collaboration with industry. However, an extended economic recession and concerns about reduce competitiveness of in key industries consider scientific research as a means of achieving economic revitalization ().

In general, the mechanisms in which UI linkages are implemented can be classified into four groups, i.e., (1) provision of suitably qualified human capital, (2) joint research program , (3) consultancy work commissioned by the industry or business and not involving original research , (4) licensing of university patents or purchase of prototypes developed by the university ().

According to Theotoky-Pogayo, *et.al.*, (xxx,xxx) the role that can be played by university in transforming the local industry xxx the following pathways, (1) the emergence of an industry that has no technological antecedent in the regional economy, (2) Development of an industry that is new to a region, (3) Transition in which an existing industry in a region goes into decline, but its core technology are redeployed and provide the basis for emergence of a related new industry, and (4) Upgrading of an industry in a region through the infusion of new production technologies or the introduction of product or service enhancement.

Out of 3155 higher Education (HE) Institutions in Indonesia only a very small number enjoy the luxury of the state of the arts research facilities. The majority of the HE institutions are barely equipped with proper teaching labs let alone research facilities. Their main role in UI linkage is providing industry with human capital and doing consultancy work for the industry. In some cases, as part of the

community pastoral duty they are involved in providing training to strengthen management and financial capacity of small-medium enterprises. Joint research between university and industry in Indonesia is almost unheard and licensing of university intellectual property (IP) is very low. As a result, it will be unrealistic to expect the innovative research outputs that will increase the competitiveness of the nation in the short term. The innovation system requires the flow of technology and information between the university or public research institution and industry. Furthermore, the success of an innovation system depends on the ability of the system to capitalize from the knowledge and new invention.

### **3. Case Study: South Sumatera**

In this section will analyze in detail the nature and readiness of two components of South Sumatera Innovation System, i.e. local university and industry, in creating a linkage that are able to capitalization of the invention into innovative products. There are, currently, 109 HE institutions operates in South Sumatera. Unfortunately, the research quality is not different from the majority of the universities at the national level. Guliani (Guliani,xxxx) found that in developing world efforts to increase the quality of research outputs must be conducted before industry can absorb them.

In MP3EI initiative, Indonesia is divided into six economic corridor in which development of the region that belongs to a particular corridor will be based on the potential and competitiveness of that corridor. South Sumatera is part of Sumatera Economic Corridor whose development theme is “ the center of agricultural production and processing and energy “. It is very natural that the industry in South Sumatera is dominated mainly by mining, oil/gas production and upstream process industries such as fertilizer, refinery, crude palm oil production. These type of industries required much less supporting industries compare to manufacturing ones. Therefore, it will be difficult, if not impossible, to accelerate the wealth distribution unless down stream industries are created. In addition, it will be difficult for the market to absorb all graduates from universities in South Sumatera.

Data obtained from Indonesian Central Banks’ SMEs database (Bank Indonesia,2011) clearly shows that all SMEs in South Sumatera xxx on low-tech sector (Bank Indonesia,2011).

### **4. Conclusions**

The success of the MP3EI as an effort to boost Indonesian economic growth and make it sustainable is very good on the paper. Reliance on the innovation system as the main driver of economic growth requires a thorough assessment of current condition at the implementation level. The university–industry linkage as the key strategic planning requires the level of research output to be increased to a level where it can be absorb by the industry. In addition the types of industry need to be

The existence of all components of innovation system physically in South Sumatera does not guarantee the success of technology diffusion from public research institutions and universities into industries. It requires strong network and interaction between those components. In addition, to be able to create valuable UIB linkages

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