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Persistent Developmental Limits to Devising Policy Innovation for Innovation Policies in Emerging Economies

Abstract

Promising industrial profiles of Southeast Asian emerging economies have met their developmental limits in the face of the Asian Financial Crisis in the late 1990s. However, following the crisis, they have not been successful in upscaling the technological competitiveness of their industries. By applying the national innovation system approach originally developed in advanced western economies as an institutional mechanism of policy innovation in light of developmentalism, I seek to explain these persistent developmental limits in Malaysia and Indonesia. My qualitative research examines literature discussing policy coordination mechanisms in innovation policies and policy documents containing coordination mechanisms involving firms, universities, and government agencies; then, how these issues implicate innovation policies in the two countries. I employ a comparative institutional analysis between them focusing on institutional characteristics of the national innovation systems, specifically their institutional obstacles occurring within development paths amidst prevailing political environments. I suggest that persistent developmental limits in Malaysia and Indonesia result from systemic failures of achieving developmental aims regardless of their politico-administrative regimes. Existing institutional frameworks of the national innovation systems, entrenched in the socio-economic prevalence of the two countries, have not fit the nations' developmental aims pursued upon innovation upgrading.

Keywords:
developmentalism; innovation governance; national innovation system; policy coordination; state-market relations

Introduction

The importance of institutional network involving firms, universities and research institutes, and governments is renowned for its essential role to enhance the technological competitiveness of industries in advanced economies. This type of institutional architecture comprising interactive relations of those actors is inherently

embodied in the national innovation system (NIS) approach, which has become prominent across the OECD since 1995. Nevertheless, this has necessarily been the case for its increasing manifestation in policy terms in emerging economies, particularly in Southeast Asia.

Southeast Asian countries are diverse in many ways which prevents them from being generalized as a similar or simplified model of polity and governance (Hill, 2014). Croissant (2014) suggests that the variety leads to different outcomes of the transition of political institutions. The political-economic realm of Southeast Asian countries posits the different unique routes of the historical development of political institutions (Shair-Rosenfield, Marks, & Hooghe, 2014), let alone compared to their East Asian and Nonwestern counterparts. Among Southeast Asian countries, Malaysia and Indonesia are characterized as the middle-developing economies that are at the opposite political-economic stances. The autocratic, interventionist and federal Malaysia has been acknowledged as better in managing macroeconomic policy than the democratic, less-interventionist, and decentralized-unitary Indonesia (Göbel & Maslow, 2013; Shair-Rosenfield, Marks, & Hooghe, 2014).

Yet, neither Malaysia nor Indonesia has been recognized as an entrepreneurial state or a developmental one (Carney and Witt, 2014). The two countries, however, have made institutional changes of the state to some extent. Both countries have also promoted entrepreneurship to advance the growth of the small- and medium-sized enterprises (SMEs) under their condition of high dependency on foreign direct investment (FDI), low-end technology used, and pressures to face in regional and global free-trade competition (Pepinsky, 2012).

By applying the national innovation system (NIS) approach as an institutional mechanism of the policy innovation process, Malaysia and Indonesia have attempted to mimic their East Asian counterparts in harnessing their economic development through innovation policies. Having successfully upgraded their technological innovation capabilities since the 1980s, both Malaysia and Indonesia seemed to be the second tier of the New Industrialized Economies (Pepinsky, 2012). Nevertheless, their promising industrial profiles have met developmental limits in the face of the Asian Financial Crisis in the late 1990s and have not been successful in upscaling the technological competitiveness of their industries since the crisis (Rasiah, 2011; Thee, 2006).

Persistent unsuccessful attempts of Malaysia and Indonesia to escalate their innovation capability deserves further inquiries about the functioning of NIS within given settings of the politic-administrative regimes. Notwithstanding, further literature on the national systems of innovation approach and innovation policies has been saturated by discourses that emphasize strategic interdependence of relations between universities, industries, and government agencies in distinctive business systems across countries but don't necessarily include the policymaking processes.

With the prevalence of practical and theoretical problems in mind, matters of devising policy innovation for science & technological innovation policies might explain problems impeding any strategies of implementing research and technology policies used by governments, firms, and universities in the NIS scheme. I seek to address the problem by explaining Malaysia and Indonesia through a variety of empirical situations in the Southeast Asian emerging economies.

Following the Introduction, subsequent parts of this article are organized to include a thorough examination of theoretical debates to address the gap therein. Next, I outline the research method used to acquire necessary data and the analysis, which are simple but suffice the need for figuring out the developmental limits

as my core explanation. Finally, I continue with analytically describing some evidence from each country resulting from data inquiries and then discuss them coherently to correspond to the theoretical debates and conclude with remarks that address the problem statement in the Introduction.

Theoretical Framework

Technological advancements to boost economic development in remarkable East Asian developmental states, which their Southeast Asian counterparts attempt to follow, highlight the importance of state-led industrializations compensating for market failure and export-orientation realizations to gain desired economic growth (Johnson, 1982). The institutional framework of government-firm-university relations has taken a central place in the national systems of innovation approaches. Its complexity has been recognized since early studies (Edquist, 1997; Freeman, 1987; Groenewegen & van der Steen, 2006; Nelson, 1993). Experiences of technology-heavy industrial buildings and developments in advanced economies have underpinned this sophisticated conception with Japan as a departing case studied by Freeman (1987) in formulating the approach, which can also be traced back to List's (1856) "national system of political economy" that emphasized coordination of nurturing complexities of national productive power amidst societal conflicts in a developed economy. Related to the micro-level process, innovation dynamism at an empirical situation is driven by interactive learning between actors (Lundvall, 1992).

All of those theorizations mentioned above suggest that the system of innovation approach has offered a new, nonlinear, and systemic lens in addressing innovation affairs, spanning from financing and managing to cluster and governing issues (Godin, 2009; Kastelle, et al., 2009). This national system of innovation approach implies that there are developmental limits to countries' capability to achieve their desired developmental goals. Countries attempting developmentalism through a similar path to former Japan and Korean regimes strive to boost their economic development by harnessing high-technology, knowledge-driven industrialization, including commercialization and export of the end-products to other countries, to be competitive against other countries in regional and global supply chains. This developmental orientation and patterns require an institutional setting that guarantees strict policy discipline. Upon possessing distinguished—monopoly or oligopoly—rights and concession in the industrial fields and marketplace granted by the government, the firms are obliged to achieve overarching high-technology industrial policy goals desired by the government. Any underachievement would lead to consequences, from revoked rights and concessions to the disestablishment of the firms. The policy discipline as an ingredient is a glass-ceiling that any countries following this developmentalist path are required to put into effect strictly, otherwise they will suffer from failed efforts. Therefore, it also implies a sort of developmental limit, as Pepinsky (2012) and Carney & Witt (2014) suggest, in terms of insufficient institutional capabilities to achieve desired developmental goals within which the government and firms interact upon industrial innovation generating activities.

Addressing the developmental limit, existing literature (see, for instance, Carney & Witt, 2014; Pepinsky, 2009; Tipton, 2009) has highlighted roles of the actors getting closer attention than working political mechanisms within NIS underpinning actors in playing those roles. Further literature on the national systems of innovation approach and innovation policies have been saturated by discourses that emphasize strategic interdependence of relations between universities, industries, and government agencies

in distinctive business systems across countries (Kastelle, et al., 2009; Sartika, 2019; Teixieira, 2014; Zanello et al., 2015). Nevertheless, these are not necessarily the case in policymaking processes (Fagerberg, 2016; Meissner, et al., 2016). The numbers of policy-related studies have recently decreased (Teixieira, 2014). In contrast, different types of coordination mechanisms underpinning policy innovations have in particular been a missing issue in mainstream research on innovation systems and innovation policies (Andhika et al., 2018; Magro, et al., 2014; Watkins et al., 2014).

The national innovation system is intrinsically political (Carayannis & Campbell, 2014; Watkins et al., 2014), for it initially is conceptualized in terms of and provides an institutional framework for coordination and negotiation across actors for innovative policies affecting innovation policies between governments and firms (Metcalfe, 1997). In this regard, the state manifests its coordination capability by providing a suitable institutional framework and conditional support for the private sector to innovate (Wade, 2003).

An institutional framework serves to maintain policy coordination while preventing dilemmas of being trapped in a state predatory system and captured by the private sector (Haggard, 2015; Springer, 2009). Thus, regardless of the political regime types, the ability of the bureaucracy to enforce the private sectors represents specific state capacities insulated from the market. However, this role is also embedded in a constructed social system of institutional changes (Evans, 1995). Consequently, systemic innovation processes and policymaking activities are mutually shaping one another (Foxon et al., 2004). Interactions between actors and their institutional environment make a national innovation system socially embedded in political and economic institutions (Fagerberg & Verspagen, 2009).

An orientation to collaboration between actors deals with formal and informal rules in an institutional framework that reflects knowledge and bargaining positions between actors in an innovation system (Ebner, 2008; 2016). In this circumstance, actors remake choices and realign their interests to each other by modifying the institutional environment to enhance economic performance (Bates, 2014). Applying a coherent national innovation system can be successful when coordination stems from commitments by and contributions from various innovation actors; they do not come solely from or are predominantly directed by a government (Cai, 2015; Boland et al., 2012). As a collective action, interactions between industries, universities and research institutes, and government agencies in coordination and giving feedback to each other consequently need a political system that enables them to do so (Carayannis & Campbell, 2014).

Methods

My analysis is qualitative in nature. I employ literature review and policy document analysis. My examination departs from literature discussing policy coordination mechanism in innovation affairs and institutional networks involving firms, universities, and government agencies; then, I explain how these issues implicate research and technology policies undertaken by Malaysia and Indonesia. This leads to solidifying inferences derived from the literature review, which generate a set of identification frameworks of both similar and different institutional explanatory variables across these countries.

I examine policy documents in various forms, e.g., laws and government regulations, long- and medium-term development planning, white papers on research and technology, published and unpublished research papers, and government and corporate annual or periodical reports. I retrieve the documents mainly from relevant official websites of key Malaysian and Indonesian

organizations responsible for undertaking science & technology and innovation policies. I analyze the contents of the documents through discerning key phrases repeatedly stated and patterns of ideas built within.

To make my explanation manageable, I use the theoretical framework of policy innovation in terms of the national systems of innovation approach, scrutinized in line with the developmentalism perspective. I employ a comparison between Malaysia and Indonesia focusing on institutional characteristics of the national innovation systems, their institutional obstacles occurring within development paths amidst the prevailing political environment of each country in the context of the empirical situation in Southeast Asian regional economies, and how research and technology policies particularly respond to these institutional challenges. Since the national systems of innovation approach underscores nonlinear innovation activities, this research scrutinizes empirical issues beyond boundaries of either sectoral technology innovations or partial innovation activities; however, it keeps up with prominent policy issues involving governments, firms, and universities instead. The issues include firm-university research collaboration policies and industrial cluster policies in Malaysia and Indonesia.

Results

Malaysia and Indonesia have successfully managed their economic recovery and further development after the 1997 Asian Financial Crisis. They have also continued being resilient, albeit at a slow pace, in coping with the effects of the 2008 global financial crisis. The two countries are characterized as middle-income economies in the Southeast Asian region, which are comparable in political and economic stances (Göbel & Maslow, 2013; Shair-Rosenfield et al., 2014). The working mechanism of national innovation systems deals with these empirical situations.

Malaysia

The Malaysian national innovation system, in particular, has taken the advantages of a combination of multiple prerequisites based on its economic development progress, i.e. a resilient annual economic growth 4.2% (World Bank, 2016a); a very competitive business climate, including higher education and technology readiness profiles, ranked 18th out of 140 countries worldwide (WEF, 2015); and a high position of global innovation at 32th out of 141 countries in 2015 (Soumitra, et al., 2015).

Malaysia merits a very good proportion of innovation sectors, between knowledge-intensive sectors, such as electronic products, automotive manufacturing, telecommunication, and the agricultural sector, which has earned a very high profile of research (Rasiah, 2008; 2011). Through an intensifying economic liberalization in Southeast Asia since 1971, Malaysia has committed to an open economy for trade and foreign investment based on export-led growth and state-led industrialization (Carney et al., 2009). Under the 1970s New Economic Policy (NEP), technology-heavy production has been a backbone for manufacturing industries.

The open economy of Malaysia, through the escalation of knowledge-intensive exports, plays a significant part in regional and international supply-chain electronic commodities (Rasiah, 2015). Following the intention to develop industrial clusters in the main regions, a science & technology (S&T) hub "Multimedia Super Corridor (MSC)" was built in 1995, including a subsequent establishment of an information & communication technology (ICT) hub Cyberjaya in 1999 (Evers & Gerke, 2015). The MSC has attracted more MNEs to operate in Malaysia (OECD, 2013). In addition, the government established the New Economic Model (NEM) and the Tenth Malaysian Plan (TMP) 2011-15. Under these policies, the hub is used as a strategic driver to improve the performance of its national innovation system towards the vision

of an innovation-driven economic development of Malaysia in 2020.

Implementation strategies of research and technology policies are different from the stated Malaysian development vision. Although national research council and business associations exist, making and implementing research and technology policies have been undertaken by government agencies, state-controlled private bodies, and government-linked universities and public research institutes. While the government has played a dominant role in regulating and stimulating innovation-driven industrial developments, private sectors have taken the lead since 1996 in financing R&D activities, especially in their contribution to R&D in universities (Carney & Witt, 2014; OECD, 2013; Thiruchelvam et al., 2011; Tipton, 2009). Yet, a deficient proportion of R&D expense by around a little over 1% of the GDP contributes to the slow increase of R&D activities and a very small number of granted patents.

Malaysia has tie-in commercial and industrial linkages to other ASEAN countries, in particular Singapore, in addition to Japan, China, and India. With a strong focus of Malaysian industrial policies on FDI flow and knowledge spillover managed by MNEs through these international linkages (Cherif and Hasanov, 2015), efforts of creating Malaysian owned technology innovations by low absorptive capacity small and medium enterprises (SMEs) are undermined (Hashim, 2012; OECD 2013). Large MNEs in Malaysia do not necessarily lead to an effective way of knowledge and technology transfer to domestic firms (Thiruchelvam, 2011). R&D activities in MNEs are tightly conducted at their headquarters outside Malaysia, which have hindered further knowledge spillover to domestic firms and made the MSC fail to enhance interactions between multiple innovation actors (Evers & Gerke, 2015; Yusof, 2013).

Approaching the ultimate achievement year of the Vision 2020 of Malaysia as an industrialist country, private sectors therein have increased their export. However, there have been widening discrepancies compared to their import volumes. The discrepancies might bring less harm directly to Malaysia's development. Nevertheless, this situation could not provide incentives that attract MNEs to invest more in the country by relocating their headquarters, or at least their R&D from other countries to Malaysia. Overachievement of exports to imports also means that Malaysia misses its chance to contribute and benefit from regional and global high technology supply chains.

Universities and public research institutes are still too far away from achieving mutually beneficial linkages with industries and continue to play minor roles in generating and sharing valuable knowledge for innovation advancements by industries and the government (Rasiah & Yap, 2015; Chandran et al., 2013). They fail to translate the increasing publications and patents, human capital development policies, and collaborative research grants into enhanced university-industry linkages and improved commercialization of R&D results (OECD, 2013; Rasiah & Chandran, 2009). Moreover, Malaysia has recently suffered from a prolonged brain drain for more than a decade. While young skilful Malaysian citizens go abroad for study and work reasons, the local education system could not produce more graduates possessing industry-proof skills. Any industrial centres developed in Malaysia have not provided enough breeding pipeline for that purpose.

An impediment to the Vision 2020 is somewhat fundamental to the developmental aims that Malaysia strives for. Part of the focus of the Vision 2020 is related to social values. Since coping with the 1997 Asian Financial Crisis, Malaysia has struggled with modernization and democratization. Moreover, the tagline of the One Malaysia indicates strong messages of national integration as a whole nation. The government has campaigned for a more inclusive and democratized nation. Nevertheless, the

special status affirmed in the Malaysian social and cultural policy remains the same, as it also does in politics, for it is embedded in constitutionally.

The counter-inclusiveness policy and industrial advancements might not significantly relate to each other, but this creates different playing fields for any actors considered native Melayu vs. the non-natives. When it comes to achieving developmental aims, one might note that its former East Asian counterparts, especially Japan and Korea, were harsh in enforcing their policy discipline. This way, the governments impose the national obligations of upgrading technology-rich industrial developments to any firms granted special rights in business. Bearing the counter-inclusiveness policy in mind, the Malaysian government would once again fail to enforce that kind of policy discipline to firms, primarily when it deals with the state-owned enterprises and firms owned or powered by native Melayu people.

Indonesia

Indonesia has been behind Malaysia in applying its national innovation system (Degelsegger et al., 2014; Göbel & Maslow, 2013). The country has neither shown innovativeness nor competitiveness in regional and global economies, despite notable economic growth and its political transformation (Tijaja & Faisal, 2014; Degelsegger et al., 2014). Although it has successfully maintained its economic resilience throughout the crises, Indonesia's annual gross domestic product has slightly decreased from 6.2% in 2011 to 4.8% in 2015 (World Bank, 2016b). The country was ranked 37th out of 140 countries on the global competitiveness scale in 2015-2016, dropping from its previous rank of 34th (WEF, 2015). It was ranked 100th out of 141 countries on the global innovation scale in 2012, and increased to 97th in 2015 (Soumitra et al., 2015). All of those achievements have fluctuated through the 1997 Asian Financial Crisis and the 2008 global financial crisis to date.

Tracing back industrialization processes, the rapid industrial growth in Indonesia had begun since the oil boom period in 1970s through trade liberalization and foreign investment, enabled by import-substituting policies toward a state-led initiative to harness large-scale industrial manufacturing projects (Tijaja & Faisal, 2014; Thee, 2006). However, the end of the oil boom period in the early 1980s had forced Indonesia to tighten its fiscal policy in financing the previous initiative and begin to concentrate on export-promotion policies in cooperation with big firms. As a result, offering protection, subsidies, and various political favours to domestic and foreign-controlled firms have expanded exports along with the growing manufacturing as the leading technology-heavy sector at that time (Thee, 2006). Nevertheless, without policy discipline imposed on these private sectors, Indonesian economic growth was not sustainable in the 1990s and subsequently collapsed from the 1997 Asian Financial Crisis (Pepinsky, 2009; 2012).

Indonesian import activities to date are superior to exports in terms of their proportion to the GDP; the latter still relies on natural resources, marking the absence in the regional and global supply chain of technology-intensive industries (Aswicahyono & Hill, 2014; Shetty et al., 2014). Following the initial establishment of the Indonesian national innovation system in 2002 and subsequent science and technology policies (Lakitan, 2013), the government has furthermore attempted to boost its national economic capability through a new strategy under the Masterplan for Accelerating and Expanding Indonesian Economic Development (MP3EI) in 2011 providing a science and technology hub for collaboration between universities, industries, and government agencies and a platform that enables multiple stakeholders to create industrial development clusters based on the primary economic potentials dispersed throughout regions (Tijaja & Faisal, 2014; Martini et al., 2012).

The industrial clustering problems have continued even though the government attempted institutional delineation of the innovation system in regional space like Indonesia's Science and Technology Park (ISTP)/ PUSPITEK built in 1976, the new Bandung Raya Innovation Valley (BRIV), as well as the existing "Jabodetabekjur" regional collaboration which are also still fragmented (Soenarso et al., 2013; Yananda et al.,2017). The Jabodetabekjur comprises interlinkage across Greater Capital Territory Jakarta, and adjacent cities and regencies: Bogor, Depok, Tangerang (and the new formed Tangerang Selatan), and Cianjur; and this regional cooperation has proven unsuccessful to date in coping with urban socio-economic challenges in this megalopolitan region. Therefore, this large-scale, cross-territorial cooperation failed to provide a conducive eco-system for breeding prosperous technology and innovation. It has not come close to solving its fundamental problem, for which it was formed in the first place.

The efficacy of Indonesian NIS is once suggested by Lakitan (2013) since problems of the Indonesian national innovation system occur at all aspects within the national innovation system, from policy, actors, to institutional environments. However, further examination below proves further macro- and micro-conditions of low effectiveness of the Indonesian national innovation system to harness science, technology, and innovations.

A thorough examination at the macro-level of the Grand Plan of National Research (*Rencana Induk Riset Nasional*, RIRN) 2017-2045 also elucidates indicative policy failures by design. The RIRN provides a sophisticated platform for the government to provide institutional directions for enhancing research within the prevalence of persistent industrial backwardness in Indonesia (Kemristekdikti RI, 2017).

First, the remaining routine five-year medium-term national development plan system was inherited from the former authoritarian New Order Regime to the early period of the Reformist Regime. The remaining system was undertaken within a context of competing agendas: multiple dimensions of public sector reform, economic recovery and growth efforts, and the struggle for an exit strategy from prolonged tightening up of loans from international donor organizations. The situation deteriorated the position of the science and technology sector from primary to supporting; thereby the sector is less prioritized. Subsequent improvement of the systemic national development planning had driven the government to bring science and technology to the fore, making it no longer a single sector among others, but embedded in the whole, integrated mainstreaming national development agenda until 2009. Only since then, the national innovation system and subsequently regional innovation system have been introduced.

Second, the national innovation system could not escape from an inconsistency of logics throughout the iterative improvement of the national development planning system. The New Order Regime use the national general guidance (Garis-Garis Besar Haluan Negara, GBHN) to secure coherence of the national development system. The Indonesian government in the reform era embraces the development direction determined by the winning presidents upon direct elections. This determination makes discontinuity issues of prioritization of science, technology, and innovation within development planning from presidential periods to another.

Third, the logic inconsistencies have also happened due to ongoing fragmented development policies. For example, in 2015 the recent administration provided the government regulation No. 14 concerning the grand plan of the national industrial development (rencana induk pembangunan industri nasional, RIPIN) 2015-2035. However, alongside this grand plan, the government has mainstreamed the human

resource development agenda without a proper and appropriate plan with the RIPIN. According to the facts, it has boosted infrastructure development in the vast regions of the country funded by foreign loans with neither any strategies of incoming technology transfer nor coherent relations with the sixteen economic stimulus packages. Very recently, the development also gets confused with the separation between the Ministry of Education and Culture (Kemdikbud, currently reorganized as the Ministry of Education, Culture, Research and Technology/Kemdikbudristek), to which the Directorate General of Higher Education (Dikti) attached, and the National Research and Innovation Agency (Badan Riset dan Inovasi Nasional/BRIN), which was the co-agency with the former Ministry of Research, Technology, and Higher Education (Kemristekdikti, currently merged to the Kemdikbud).

Amidst those confusing changes mentioned above, the government has maintained a hierarchical mechanism in coordinating research and technology policies with business associations and the national research council. It has also set public universities back under its subordination with the status of public service working agencies. The regulatory frameworks prevent them from having flexible resource managements despite the opportunities for public universities to generate their resources after recent higher education reforms in the late 1990s (Moeliodihardjo et al., 2012). In practice, the government maintains roles in regulating and financing, while MNEs keep their marketing and operation in Indonesia without enabling knowledge flow from their R&D overseas to domestic firms (Kuncoro, 2012).

At the micro-level, the R&D in universities and public research institutes have relied on a meager allocation of the government budget. At the same time, private sectors allocated a lower profile of budget for R&D (Soenarso & Sadewo, 2014) while the total expenditure of all sectors for R&D remains below 1% of the GDP (OECD, 2013). The cooperation between universities and industries also remains low and poor to both sides. Multiple governments' schemes of research grants encouraging collaborative research and utilizations for universities and industries become ineffective in this matter due to the incoherence of the government policy and the unconducive regulatory framework to the need of sustained resource management and further collaboration (Moeliodihardjo et al., 2012; Putera & Jannah, 2012). Recent business permit and investment service reforms implemented by the government have also not sufficed to improve the ease of doing business (Shetty et al., 2014).

Discussions

The findings of empirical evidence in Malaysia and Indonesia prompt an understanding that innovation as a systemic process implies its scope of dealing with complex circumstances, in which different economic activities, policy fields, and multiple actors coexist. The systemic process results from established socio-economic behaviours and activities shaped by constraints and incentives provided by an institutional framework primarily at the national level. Nelson (1993) also explains its delineation of the framework at the regional level. This understanding fills in gaps which many analyses of NIS in empirical situations have paid little attention to institutional environments underlying the complexity of interplay actions between actors, and have furthermore undermined the determination of institutional frameworks and industrial structures to economic performance of firms and national competitiveness, as formerly suggested by Edquist (1997; 2005).

At the very macro-level, different politico-administrative regimes have shaped varied overarching economic development goals. Nevertheless, these various political-economic constellations have not prevented them from ending up with similar institutional shortcomings

that underpin the working mechanism of their national innovation systems, respectively.

Within the politico-administrative regimes in Malaysia and Indonesia, Malaysia's federal system cannot facilitate a better business environment for MNEs to invest in R&D activities linked to universities alongside their business services therein. It is quite the opposite to see that Indonesia has recently exerted more centralized authorities when it comes to conforming with open-market policies, undermining the local autonomy policy for about two decades. This centralization of authority under the national government's foundation seems to be failing to address important challenges in implementing the NIS.

Neither Malaysian nor Indonesian NIS institutional designs can be helped. Considering nonlinear and multidirectional characteristics of the NIS approach that take place therein, innovative policy coordination mechanisms in Malaysia and Indonesia do not address whole comprehensive innovation processes in line with their varied developmental goals. There is a grand plan of science, technology, and innovation embedded in the national development plan. However, they contain no comprehensive approach and strategies providing linkage across government sectoral departments, industries, and universities. Moreover, consistencies of those development orientations remain in question, leaving the development plan unable to assure simultaneous action plans for implementation by multiple actors outside government agencies.

Malaysia and Indonesia have suffered from the lack of proper institutional arrangement to cope with the side effects of previous economic policies (Basri, 2013; Hill et al., 2012). In addition, an impediment to the growth of innovation and entrepreneurship comes from the state regulations that create a high barrier to market entry (Touchton, 2015), while any significant efforts to ensure the regulations are effectively enforced are missing.

Against considerable economic growth of Southeast Asian middle-income economies, policymakers have seemed to attempt to make credible commitments with firms and investors that compensate adequate political institutions in enforcing the rule of law (Touchton, 2015). However, problems in applying the national innovation systems in the two countries persist, for they are reinforced by the prolonged Malaysian political transition (Ufen, 2013) and the entrenched political stagnancy in the Indonesian state institutions (Mietzner, 2015). Compared to East Asian economies, which are successfully advancing innovation capacities within global commodity chains, it is typical of Southeast Asian middle economies to have institutional arrangements constrained by coalitional demands in addressing the systemic vulnerability of a country's economy (Doner et al., 2005; Pepinsky, 2009). Moreover, in this situation, actors in Malaysia and Indonesia miss a systemic policy coordination mechanism and lack linkages and collaborations in responding to a complex policy environment effectively. The circumstances, therefore, go broadly to cope with a failure by the design of innovation system and innovation policies.

Persistent developmental limits related to the upscaling of technological competitiveness and economic development in Malaysia and Indonesia result from systemic failures of achieving developmental aims. These problems are entrenched in institutional settings of coordination mechanisms of policy innovation in the two countries.

Conclusion

My analyses of empirical features explain that coordination mechanisms of the national innovation system (NIS) and logical inconsistencies of the underpinning national development plans become persistent developmental limits to devising policy innovations for fruitful science,

technology, and innovation policies. Specifically, the states' interventions in Malaysia and Indonesia have predominantly played roles over the market and other governance actors, albeit pretended to be government-firm cooperation and open economies that ought to make policy innovation actors internationally connected.

In sum, existing institutional frameworks of the NIS, which are entrenched in the socio-economic prevalence of Malaysia and Indonesia, have not fit the nations' developmental aims or pursued innovation upgrading. Consequently, my whole argument explains persistent developmental limits to these emerging economies at macro-and micro-levels of the NIS, regardless of their politico-administrative regimes.

The argument also explains why typical Southeast Asian economies have always stuck to high dependence on innovation transfer from advanced nations, as Zanello, et al. (2015) and Chen (2014) outlined. Innovations modified and diffused in these countries fail to meet the local needs. Their ability to innovate also declines due to unconducive institutional environments and political-economic structural problems that lower the ability of actors to innovate.

Coping with changing political environments, all countries need to develop their economies through coordination mechanisms underpinning policy innovations. The policy innovations in this regard need advancing preconditions and augmented requirements beyond industrial policies and need to escape from debatable choices of types of regimes ranging between appropriate state intervention and market-oriented development in a context of government-business relations, reaffirming Evans (2011), Haggard (2015), and Kohli (2004). Thus, this concern raises a need for a further translation into a coherent institutionalized government-business relation embedded in a social system that affects technological innovation for economic development.

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