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# Layering the developmental state away?

## The knock-on effect of startup promotion policies on the innovation bureaucracy in South Korea.

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## **Abstract**

The role of the state and public agencies has come to the fore again since the global financial crisis to spur innovation-led growth. Alimeted by the success of global tech giants in particular, new policy rationales emerged in favor of government support for ICT startups. The paper addresses the crucial question of whether the corresponding organizational capabilities do exist to implement such policies. This article focuses on the case of South Korea, renowned at the same time for the strong capacities of the state and an institutional setting hostile to new ventures. The main contribution of the paper is to analyze institutional change within the Korean innovation bureaucracy and the evolution of its organizational capabilities, underpinning the startup promotion policies implemented since 2013. Under the appearance of continuity of state innovation capacities, the startup promotion policies foster a restructuring of the public infrastructure supporting the corporate sector. The results, drawn upon an extensive fieldwork in the Korean startup ecosystem, indicate that there is a loss of state capacities, which impede on the implementation of large-scale promotion of the manufacturing industries.

**JEL Classification:** O14, O31, O38

**Key words:** Innovation bureaucracy, innovation policy, Korea, state capacity

## **Introduction**

The fragmentation of global value chain and the rising complexity of manufacturing systems have had repercussions on the design of industrial and innovation policies (Andreoni, 2017). A new governance regime of industrial policies is emerging, succeeding the neoliberal governance of the 1980s, under which industrial policies became “hidden” in some countries (Block, 2008), or of limited scales in other countries (Chang H.-J., et al., 2013). In this context, startup promotion policies participate to the attempt of an innovation policy renewal, especially for countries reaching the technological frontier. At the crossroads of industrial and innovation policies, the promotion of young, innovative high-growth SMEs, or startups, has been at the top of the policy agenda of many countries since the rise of new global tech giants, such as Google and Facebook, in the late 2000s. Startups are seen as a new engine to spur growth in stagnant advanced economies and to foster leapfrogging in emerging economies (OECD, 2013; OECD-STI, 2014). Previous research has established that public effort should focus on improving young firms’ access to finance, fostering entrepreneurship behaviors, and providing a

stable regulatory environment (see Lilischkis, 2011; OECD, 2013; OECD –Entrepreneurship 2016). However, relatively few studies have assessed the concrete organizational features of the state at the root of the state innovation capacity, underlying the implementation of such policies (see Mazzucato, 2013; 2015; Karo & Kattel; 2014, 2015, 2016).

The case of South Korea (henceforth Korea) is especially interesting because, although it is one of the most successful experiences of late industrialization and technological upgrading, its innovation model is called into question. It has been pointed out that, despite its highest R&D spending among OECD countries (4.29% of GDP in 2014), the Korea national innovation system suffers from a rigid business culture, a domination of large firms, and an overwhelming role of the state, which are seen as disadvantages for fostering highly innovative ventures (OECD-STI, 2014). The recent attempt by the Park administration (2013 – 2016) to promote the startup ecosystem has revived the questions about the capacities of the state to foster such a business dynamic. While the Korean developmental state was characterized by a strategic vision of S&T policies and by strong organizational capacities to implement large-scale industrial policies during the industrialization period, it is not clear what kind of state capacities are needed at the technological frontier.

This paper addresses this research gap by focusing on the impact of startup promotion policies at the core of innovation policies in advanced and emerging economies, including Korea, on the institutional restructuring of state capacities in the contemporary period. Departing from the developmental state literature that has mainly been concerned with the policy objectives of the state, or on the strategic (or not) character of recent industrial policies, the paper examines the building of state innovation capacities in a historical perspective. It is done by situating the practices of actors in charge of the startup promotion organizations within the existing public apparatus dedicated to industrial policies and set up by the developmental state. The article draws upon extensive primary material, gathered from interviews with Korean policy makers and leading actors of the Korean startup ecosystem in Seoul, Sejong and Paris between September 2013 and September 2016. It also makes use of active participation in entrepreneurial events in Seoul in 2016, secondary source analysis, and literature review.

This paper engages with the recent studies that are putting to the fore the organizational aspects of the state innovation capacity in fostering innovation-led growth (Lazonick & Mazzucato, 2013; Mazzucato, 2013; 2015; Karo & Kattel; 2014, 2015, 2016). These studies make an important contribution by building a bridge between the literature on national innovation systems and the development state framework. However, the dynamics of institutional change in the understanding of the evolution of state innovation

capacity is not yet fully acknowledged. Therefore, the main contribution of this paper is to further this research agenda by analyzing the mechanism of institutional transformation of the state innovation capacity. Under the appearance of continuity of state innovation capacities, the startup promotion policies foster a restructuring of the public infrastructure supporting firms. More precisely, the practices and representations of actors within state agencies indicate that there is a loss of state capacities, which impede on the implementation of large-scale promotion of the manufacturing industries.

The article proceeds as follows. First, a theoretical framework is sketched based on the insights from the national innovation system literature and the comparative institutionalist analysis, which circumvent the continuity of the developmental state argument for preferring a more dynamic approach. The second section provides a long-term perspective on the organizational arrangements within the state in charge of industrial and innovation policies. For each period since the 1960s, the objectives of industrial and innovation policies are described, with an emphasis on the organizational features of the state. Third, the article analyzes the different institutional logics at play in these organizations in the case of recent startup promotion policies. Fourth, it characterizes a mode of institutional change driven by the different types of institutional logic: the one of layering. Finally, it concludes on the organizational capabilities of the state and implications for policy-makers.

## **1. Building state innovation capacities: institutional and organizational features**

This section addresses two interrelated questions: How do states' innovation capacities evolve when countries are reaching the technological frontier? What are the processes of change? It is proposed here to bridge a gap between the Schumpeterian approaches (Lazonick & Mazzucato, 2013; Mazzucato, 2013; Karo & Kattel, 2016) of the state and the analytical tools using comparative institutional analysis (Jackson & Deeg, 2008; Streeck & Thelen, 2005; Hall & Thelen, 2009). First, the emerging governance regime of industrial policy in the contemporary period is described with a special emphasis on its organizational features. Then, it is argued that the linkages between the organizational and the institutional level are crucial to analyze the dynamics of innovation capacities.

### **1.1 How should the innovation bureaucracy be organized? Organizational features of the contemporary governance regime of industrial policy.**

The renewed interest in industrial policies and the role of the state since the global financial crisis have raised the question of what industrial policies should be when countries reach the technological frontier (Andreoni,

2017). This section sketches the contours of the emerging governance regime of industrial policies, which involve the policy objectives, the design of policies, and their concrete implementation.

Recognizing the importance of the structures mediating industrial and innovation policy, this article is framed around recent contributions that stress the importance of the concrete implementation of policies with an emphasis on the organizational level (Lazonick & Mazzucato, 2013; Karo & Kattel, 2014; 2015; 2016; Mazzucato, 2015). The policy capacity, or the political space available, to design industrial/innovation policies, is left aside to concentrate here on the administrative capacity of implementing them (Karo & Kattel, 2014). More precisely, the focus is on what Karo & Kattel (2015) call the 'innovation bureaucracy', which consists of the state's organizations in charge of innovation and technology promotion. State innovation capacity is defined in this paper as the concrete ability of the state economic apparatus, at the institutional and the organizational level, to carry on policies aiming at unlocking innovation across industrial activities.

This research agenda builds upon the National Innovation System (NIS) approach (Freeman, 1987; Lundvall, 1992; Nelson, 1993; Edquist, 1997) and the Developmental State approach (Johnson, 1982; Amsden, 1989; Wade, 2004), which have discussed the institutional structure and organizational features implementing industrial policies since the 1980s. Based on different premises, respectively Schumpeterian and Weberian, these two approaches have been developed side-by-side, in reference to the seminal work of Friedrich List on late industrialization (Freeman, 1995). The main difference is that the former focuses on technological upgrading, enabled by institutional setting, while the latter analyzes the crucial role of politics and bureaucratic structures of the state to propel development (see Freeman, 1987; Johnson, 1982). The existing literature on the canonical cases of state-led development and fast technological upgrading, such as Korea, suffers from shortcomings when it comes to the state innovation capacity. Most of the studies using the NIS approach have limited the analysis of the role of the state to an enabler or as a resource of innovation, quantified by the amount of R&D expenditures. On the contrary, the developmental state framework has not dealt directly with state innovation capacity. Rather, selected industrial policies or innovation policies have been used to question the intervention of the state in the economy. These two approaches have been essential to account for the structural changes in the industrial dynamics as well as the evolution of institutional settings since the mid-1990s. In particular, they have highlighted the increasing modularity of the industrial structure, with a breakdown of NIS at the regional and local scales (Cooke, et

al., 1997; Breschi & Lissoni, 2001), and an emphasis on the role of network of state organizations (O’Riain, 2004; Breznitz, 2007).

The emerging governance regime of industrial policies is characterized by an increasing role of decentralized and flexible agencies. While a central “pilot” agency was characterizing the developmental state-led industrialization, more attention is given to decentralized, and potentially more flexible, state agencies to support multi-scale innovation systems. For instance, O’Riain (2004) departs from the “central” developmental agency view to stress the power of decentralized state agencies embedded in local, national and international networks (2004: p30). Breznitz (2007: p32) underlines the variety of state-industry linkages that are reflected by the organizational structure of the state. Breznitz and Ornston (2013) distinguish the central developmental agencies from the Schumpeterian ones which develop at the periphery of the state apparatus. Their peripheral status grants these agencies with more autonomy from other central agencies, but also from dominant interest groups. As a result, they can use their policy space to develop the policy tools and instruments that enable radical innovation. Based on the case of a Finnish and an Israeli agency, they describe in historical perspective the emergence of these agencies at the periphery, their disruptive role within the innovation bureaucracy, and their progressive restructuring while reaching the core agencies. These examples pinpoint the organizational dynamics within the state that bring the peripheral agency to the core at the price of a loss of innovation capacity.

Another key feature of the emerging governance regime of industrial policies is the increasing mix of organizational forms that operate at different levels of the manufacturing systems. Karo & Kattel (2014, 2015, 2016) go beyond a dichotomy between central/peripheral agencies and argue that a variety of organizational forms is needed to enable innovation-based growth. The coordination of this organizational variety is then a defining role of an entrepreneurial state which takes the lead in the direction of innovation, and also ensures a compatible institutional and organizational setting (Mazzucato; 2013, 2015). It can result in the governance of a “varieties of industrial policy”, as described by Andreoni (2017), in which different policy levels are confronted to policy targets. In a sense, to each intersection of the two corresponds a form of organization, as well as some capabilities. In this paper, it is stressed that a parallel can be made between the organizational capabilities of the firm (Teece & Pisano, 1994; Dosi et al., 2000; Winter, 2003) and the organizational capabilities of the innovation bureaucracy. With the introduction of the New Public Management under the neoliberal governance, practices from the private sector have been introduced in the state apparatuses (see Christensen & Lægred, 2002). It has been a driving force of transformation, for several decades of state organizations, away from a

meritocratic and rational Weberian bureaucracy and towards, by paraphrasing Teece (1994), a 'resource-based strategy'. Public organizations are therefore managed strategically, and as a firm, they have to build capabilities to address a changing institutional and macroeconomic environment. For these reasons, a premise of this article is that the analysis of the evolution of state innovation capacities needs to consider change at both the institutional and the organizational level.

## **1.2 Institutional perspective on the dynamics of developmental state innovation capacities**

This section aims at complementing the evolutionary approach of state capacities, focused on the organizational level, by a deeper understanding of change at the institutional level, in co-evolution with the organizational one (Hollingsworth, 2000). In particular, the analytical tools developed by the comparative institutional analysis approach (see Streeck & Thelen, 2005; Mahoney & Thelen, 2010) are mobilized to highlight the mechanisms of institutional change. Institutions are defined here as "building-blocks of social order" (Streeck & Thelen, 2005:p9). This simple definition grasps the main feature of the institutional level, the one of structuring social relations, which subsumes the organizational level.

The research strategy consists in deriving the analysis of institutional change from the observation of practices at the level of the actors. The concept of institutional logic, defined as "*the typical strategies, routine approaches to problems and shared decision rules that produce predictable patterns of behavior by actors within the system*" (Jackson & Deeg, 2008), is considered here as the main linkage between the institutional level and the organizational level. More precisely, institutional logics run through the organizations that mediate and reflect on them. The organizational capabilities of the state are thus the concrete structuring of actors' behavior in order to produce public goods or implement public policies. According to Hollingsworth (2000), "*an institutional logic in each society leads institutions to coalesce into a complex social configuration*". Yet, this article contends that one determinant factor of institutional change comes from the coexistence of different institutional logics within the national institutional setting. The comparative institutionalist analysis approach has provided many case studies on gradual institutional change which, most of the time, involve an uneven distribution and pace of change (see among many the empirical contributions in Streeck & Thelen [2005]).

On the hypothesis that there exists a finite number of mechanism of gradual institutional change, Streeck & Thelen (2005) show to what extent it is useful to distinguish between the process of change (incre-



mental/abrupt) and the result of change (continuity/discontinuity). Their framework enriches the path-dependency literature and the punctuated equilibrium by looking at gradual but transformative change. They identify five modes of gradual institutional change, which are driven, consciously or not, by actors in order to make outcomes of institutions compatible with their strategic selectivity. Hence, depending on the balance of power in the social space, new practices within old institutions can be favored (conversion), new institutions can overcome former ones (displacement) or compete with them (layering). Change can also occur through a strategic passivity of agents who prevent institutions to adapt to a changing environment (drift), which can make them collapse (exhaustion). The modes of change, often combined, in a given area reveal the institutional dynamics at play that lead to a specific outcome of public policy. It also reflects deeper mechanisms of change at the organizational level, including isomorphism (DiMaggio & Powell, 1983). In reference to the previous section, a parallel can be made between the emerging governance regime of industrial policy, characterized by a larger variety of organizational forms and of modality depending on the policy level, and the diversity of institutional logics. Moreover, because the capabilities of the state innovation bureaucracy have evolved since the industrialization, specifying the underlying mechanism of change contributes to a better understanding of the institutional dynamics related to the innovation system.

Such an approach is especially useful to disentangle the lively debate about the aftermath of the developmental state in Korea. On the one hand, the debate revolves around some scholars who tend to see any industrial policy implemented by the state as an empirical evidence of the continuance of the developmental state in Korea. In these contributions, only marginal institutional change is acknowledged; the developmental state is then adapting (Wong, 2004), hybridizing (Chu, 2014), or is to be found in the developmental mindset of bureaucrats (Thurbon, 2014). On the other hand, some scholars identify a more radical change following the neoliberal restructuring of 1997. In this view, developmental states have been dismantled, or at least their sustainability is conditional on institutional innovations (Chang, H.-J., 2000; Chang, H.-J. & Evans, 2000; Block & Evans, 2005; Pirie, 2006, 2008). In any case, the conclusions of continuity<sup>1</sup> or rupture tend to reify institutional processes; the transformation of state's innovation capacity is not addressed in the developmental state literature.

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<sup>1</sup> Another type of continuity argument, based on institutional path dependency, is suggested by the Varieties of Capitalism framework (Hall & Soskice, 2001; 2004), which stresses the consonance between institutional arrangement and the type of innovation. Korea's dream of knowledge-led growth would then be doomed by its institutional path dependency.



Building on the theoretical framework above, the next section surveys NIS and Developmental State empirical contributions in a complementary fashion to give an understanding of the building of innovation capabilities of the Korean state since the 1960s and put into context the startup promotion policies launched in 2013.

## **2. Historical perspective on the building of state innovation capacities in Korea**

While there is a broad literature dealing with the institutional, socio-economic and political dimensions of the developmental state, its organizational features are, surprisingly enough, largely overlooked (Karo & Kattel, 2015). This section fills this gap by reviewing, for each period since the 1960s, the objectives of industrial and innovation policies as well as the infrastructure favored and the instruments used. First, the main features of the developmental state from the 1960s to the 1970s are exposed. Then, more details are given on the policies targeting the ICT sectors since the 1980s. The third subsection focuses on venture and startup promotion policies since the '97 Asian crisis.

### **2.1 The developmental state during the industrialization period (1961-1979)**

Whether to improve it or to discredit it, the Korean political economy has mainly been studied through the lens of the developmental state framework, especially when applied to the current period (Debanes & Lechevalier, 2014). This framework is based on Johnson's observation on Japan (1982) and was extended to the Korean case. The developmental state, identified as the main factor of success of Korea's fast industrialization, described how an authoritarian regime, based on a vast bureaucratic apparatus, orchestrated the industrialization by relying on extensive strategic and selective industrial and innovation policies (Choi, 1987; Evans, 1992; Minns, 2001). Amsden (1989: pp139-155) showed the prominent role of the government in supporting the industry by "getting the prices wrong", which was decisive to foster a cooperative relationship between the government's and large firms' industrial strategies. Similarly, Wade (1990: pp306-325) pointed out the specific way the Korean state actively "governed the markets" as a factor of success. More attention tended to be given to the balance of power between the ministries and state agencies, (Hwang, 1996; Chibber, 2002) rather than to the instruments used and the organizational infrastructure.

There are two key organizational features of the industrialization period in Korea: the centralization by the Economic Planning Board, and the role of the public financial institutions. The organizations in charge of the export

promotion policies of the 1965s, followed by the Heavy and Chemical Industry drive of the 1970s, were the Blue House (the presidential executive office), the Economic Planning Board (EPB), and the Ministry of Commerce and Industry (MCI). The EPB is the most emblematic state agency of the developmental era; founded in 1961, the EPB was in charge, under the direct authority of the President, of the 5-years plans and their budget, as well as of coordinating agencies involved in the industrial strategies.

The state used three leverages: industrial policy, financial policy and price control (Luedde-Neurath, 1988). The financial policy was overviewed by the Ministry of Finance and mainly implemented by the state-owned banking system (mainly the Korea Development Bank, the Export-Import Bank, the Bank of Korea, and the Industrial Bank of Korea). It took the form of policy loans, export subsidies, and tax incentives. The economic plan also involved a technology acquisition part. The promotion of Science & Technology (S&T) was supported by the enactment of various Acts in the late 1960s, the creation of a dedicated Ministry of S&T (MOST), the foundation of a national engineering school (KAIS) and the establishment of numerous public S&T research institutes (Chung, 2011). The S&T policies were relatively ineffective in these decades because of the export and growth targets led by industrial agencies. Hence, the technological upgrading of the 1960s and 1970s was mainly enabled by indirect instruments, such as import-substitution, the protection of infant industry, and the acquisition of foreign technologies (Kim L., 1993).

These two decades of industrial policies successfully increased the contributions of export to GDP and enabled the upgrading of the Korean manufacturing sector, but also led to severe imbalances of the industrial structure with over-investments of firms and the control of markets by a few large conglomerates. The next subsection focuses on the policies promoting ICT, as well as those focusing on SMEs, to rebalance the industrial structure.

## **2.2 The role of the state in the fast development of the ICT sector from the beginning of the 1980s**

Drastic changes happened in the 1980s, following the assassination of President Park in 1979, with a shift towards a progressive liberalization of the economy and eventually the democratization of 1987. Regarding industrial and innovation policies, S&T policies supplemented the main objectives of export, growth, and value chain upgrading. Moreover, promotion of R&D and human capital development and support of intensive-R&D support replaced sectoral industrial policies.

The state economic apparatus remained more or less unchanged, but the new administration brought about a new balance of power between state agencies and fostered the linkages across the maturing national innovation system (Kim, L., 1999). The EPB regained power in the 1980s and switched its gear towards liberalization and the containment of chaebols' market power. Public financial institutions providing patient capital to strategic sectors were left untouched by the privatization process of commercial banks. The new S&T orientation was coordinated by the EPB and the Presidential Conference for Promotion of S&T. Public technical services were created to assist technological upgrade of firms and to centralize information about new technologies available; technology transfer to the private sector was facilitated by public R&D institutes (Kim & Dalhman, 1992). To increase technology transfers, the government increased technology-based public procurements and eased the restriction on FDI and foreign licensing. Besides, market competition was promoted with the Fair Trade Act (1980), the change of IPR law and an inflection towards the promotion of SMEs. The financial and industrial policy instruments from the previous period remained, and new R&D direct and indirect subsidies were introduced.

The public authorities targeted two main industries from the 1980s to the 1990s: the telecommunication industry and the semiconductor industry, using a similar set of organizational arrangements. In both cases, the Korean governments played a pivotal role. At the ministry level, the main instruments used were the selection of players, the restriction of foreign firms and the selection of technology standards (Lee H. & Han, 2002; Ahn & Mah, 2007). A specialized research institute (Electronics and Telecommunications Research Institute - ETRI) was put in charge of coordinating the different actors involved in the national projects. The main orientation of the innovation policies towards the ICT sector evolved to the promotion of software in the early 2000s (Lee K.-S., 2009; Kim S.-Y., 2012; Kim, H., Shin & Lee, 2015). Across different initiatives, the organizational arrangements from the previous decade seemed to prevail: an umbrella ministry, a research agency acting as a coordinator, and a consortium regrouping the main actors. For instance, in 2004, the Ministry of Information and Communication (MIC) launched a new national project (*I7839*) to develop the next generation of high-tech services for the telecommunication sector, backed by governmental agencies including ETRI and various technology-centered forums (Kim S.-Y., 2012). Nevertheless, despite some features of continuities, some scholars stress the organizational shift towards a stronger role of private actors and nonstate actors (Lee K.-S., 2009; Choi, et al., 2011; Park, 2012; Larson & Park, 2014).

### **2.3 Beyond the chaebols: startups and SMEs promotion policies in Korea**

The inception of SMEs policies can be found in the developmental state era, but at a limited scale and circumscribed to financial policies until the 1990s. One major feature of SME promotion during the developmental state era was exporting SMEs, and subcontractor SMEs, which contributed to the chaebols' expansion with a differentiated strategy: vertical integration and sustained subcontractor relations, depending on the cases. The main instruments used to support SMEs were policy loans and R&D subsidies (Kang & Mah, 2015). In particular, two public financial institutions that lend or guarantee credit to SMEs were founded during this period: the KODIT and the KOTECH in 1976 and in 1989, respectively.. Their role was to alleviate the credit constraints of SMEs, especially technology-based SMEs in the case of KOTECH. The KOTECH was given a more prominent role in 1998 by taking on the venture certification process. These two agencies were actively mobilized during the 1997 crisis, the dot-com bubble crash, and the 2008 crisis.

It is only in the late 1990s that the Korean governments started to actively support SMEs with an emphasis on new innovative ones (Park, 2001). To prepare the adherence to OECD in 1997, the Kim Young-Sam government engaged with five years of intense domestic reforms and the implementation of OECD guidelines, including preferential treatments of SMEs and the improvement of their access to finance. To this end, the Small and Medium Business Administration (SMBA) and an SME electronic stock market KOSDAQ were created in 1997. Besides, the post-1997 restructuring of large corporations coupled with the venture rush gave some political space to the government to support startups. The Kim Dae-Jung government, elected in 1997, tried to seize the opportunity to promote new ventures and entrepreneurship while restructuring the chaebols (Haggard et al., 2003: p82). The SMBA was given a substantial role and was placed under the direct responsibility of the president in 1998 (Shin & Chang H.-J., 2003: p109). Furthermore, the government facilitated access to the KOSDAQ and enacted the "Venture certification system" in 1998, which opened rights to various benefits (tax cuts, loan programs, subsidies). Existing state agencies were then redirected towards the support of new and innovative ventures and pledged to make the venture environment more favorable to foreign investors. Public entities have since become major players in the venture capital industry. The two largest instruments used by the public administration to support startup financing, after credit, loan and guarantee schemes, are a fund-of-funds and co-investment funds (Jones & Kim, 2014; Thurbon, 2016: p107).

SMEs also benefited from cluster policies and other regional innovation policies. At the regional level, as part of a strategy to build local innovation capabilities, the central government under the Kim Young-Sam administration tried to enact regional clusters SMEs (Park S. O., 2000). In every province of Korea, science parks were created in the 1990s with special funding opportunities for SMEs. In the mid-2000s, the state designed biotech (Wong, 2004; Lee et al., 2009) and nanotechnology clusters (So et al., 2012; Park, 2013), spread out across the country. The Roh Moo-Hyun administration (2002-2007) emphasized the strengthening of the regional innovation systems, especially the linkages across innovation networks, as well as the quality of innovation (Seong & Song, 2008).

#### **2.4 Continuities and change in state innovation capacities**

Given the rapid state-led industrialization of Korea, followed by a steady value chain upgrading in the high-tech sectors (Lee, K., 2013), it is fair to say that state capacities related to industrial and innovation policies have been built (Tables 1 and 2). The objectives of industrial and innovation policies have derived from the challenges faced by the Korean economy and by the different political agendas. The industrialization period was dedicated to export promotion, value chain upgrading, and heavy industries (Table 1). Then, in the 1980s, the focus has shifted towards the ICT sectors. Since the 2000s, support towards new segments of the ICT sectors and high-tech industries continued, with more concerns over sustainability, industrial and geographical balances (Table 2).

The innovation bureaucracy has ripened into a decentralized organization with the increasing role of specialized institutes. The centralization and coordination managed by the EPB faded away in the late 1980s. Large ICT-related projects were initiated in the 1990s, managed by the recently created National Research Council and a consortium of state, university, and private actors. The Blue House has kept driving the overall policy objectives, but the ministries and public research institutes took charge of the design and the implementation of strategic industrial policies. Recently, the Blue House came back at the center of industrial policy vision with Lee Myung-Bak's 'green growth' and Park Geun-Hye's 'Creative Economy'. The development of the financial sector has propelled a shift in financial policy from the public financial sector to the private industrial banks. The public financial institutions, such as the Korea Development Bank, have remained active to support financially constrained firms and under-developed segments of the financial industry (Thurbon, 2016).

The scope and instruments associated with industrial, regulatory and financial leverages to support strategic firms and sector have evolved. In general, support to industrial sectors has been made more horizontal with

the targeting of R&D activities and knowledge creation rather than specific firms or industries. Nevertheless, the set of sectors designated as engines of growth, which has evolved, keeps enjoying special benefits. The strengthening of the national innovation system (and the regional ones) projects to develop hand-picked technology with heavy direct sponsoring of the state. Some new instruments have been developed in the realm of industrial policy, such as public-private partnerships and geographical exceptions (from free economic zone to high-tech parks). Regulatory policies shifted from price control and FDI restrictions to selection of technological standards and management of international treaties. Instruments of financial policies have largely remained the same with policy loans, export credit, guarantees and fiscal incentives. Changes came from the increasing importance of R&D or technology criteria to get state funding, as well as the promotion of financial innovation by state financial institutions, such as green bonds or equity financing.

The next section is dedicated to inquiring about the organizational arrangements promoted by the startup promotion policy initiated in 2013. From the starting point of this policy outcome, the infrastructure implementing it is investigated, as well as its functioning. More precisely, institutional logics are identified based on the representations and practices of actors in these agencies.

**Table 1.** Evolution of selected criteria of the Korean National Innovation System

	1960	1970	1980	1990	2000	2010	2015
Share of Merchandise Exports (% GDP per cap) – <i>Penn Tables</i>	1.9%	8.7%	25.8%	23.5%	33.8%	46.1%	53.1%
Share of MHT exports (% total export) – <i>CHELEM database</i>	--	9.5%	26.8%	46.6%	68.2%	75.6%	76.4%
TFP level at current PPPs (USA = 1) – <i>Penn Tables</i>	0.27	0.28	0.41	0.59	0.64	0.64	0.63
Inward FDI (% GDP) – <i>UNCTAD Tables</i>	--	--	1.8%	1.9%	7.8%	12.4%	12.9%
Outward FDI (% GDP) – <i>UNCTAD Tables</i>	--	--	0.2%	0.8%	3.8%	13.2%	20.5%
Total R&D expenses (% GDP) – <i>NTIS stat</i>	0.2%	0.4%	0.5%	1.6%	2.2%	3.5%	4.2%
Patent registration number – <i>NTIS stat</i>	--	--	1,632	7,762	34,956	68,843	101,873
Number of full-time researchers (based on FTE) – <i>NTIS stat</i>	--	--	20,718	67,062	108,370	264,118	356,447

Source: S&T statistics are from NTIS stat; Trade statistics are from CHELEM database and UNCTAD,

**Table 2.** Evolution of organizational arrangements and instruments of innovation policies in Korea since the 1960s

	1960s	1970s	1980s	1990s	2000s	2010s
	Manufacturing upgrading		Global value chains upgrading		R&D upgrading	
Industrial policy	Support Export Development	Promote Heavy and Chemical Industries	Shift from Industry Targeting to R&D Support	Provide Information Infrastructure and R&D Support	Promote New Engines of Growth and Upgrade R&D	Promote New Engines of Growth and Upgrade R&D
Sector	Labor intensive manufacturing in textiles, garments, and footwear	steel, nonferrous metal, machinery, shipbuilding, electronics, and chemical engineering	Semiconductors, Telecommunication, Automobile	ICT related sectors (semiconductors, telecommunication, mobile handset)	next-generation Internet, fiber-optic technology, digital broadcasting, wireless communications, software, ICT startups	Deep tech sectors, new internet industry, green energy, smart grid, biotech and nanotech, ICT startups
Coordination	Objectives fixed by the Blue House; design and coordination by the EPB.	Objectives fixed by the Blue House; design and coordination by the MCI.	Objectives decided by the EPB and Presidential Committee for S&T. Building of capabilities of ministries to fund projects.	Objectives fixed by the MCI, role of the specialized institute ETRI for coordination.	Objectives fixed by the MCI and the MOST, continuing importance of the specialized institute ETRI.	Objectives fixed by the Blue House, important role of ministries, decreasing role of specialized institutes.
S&T Policy	<ul style="list-style-type: none"> <li>- creation of MOST/KIST</li> <li>- Five-Year Economic Plan including S&amp;T</li> <li>- S&amp;T Promotion Act</li> <li>- Comprehensive Export Promotion Program</li> <li>- control of foreign ownership</li> </ul>	<ul style="list-style-type: none"> <li>- Government Research Institutes</li> <li>- R&amp;D Promotion Act</li> <li>- Technical and Vocation Schools</li> <li>- Daedeok Science Town</li> </ul>	<ul style="list-style-type: none"> <li>- National R&amp;D Plan</li> <li>- Private Sector Initiatives in R&amp;D</li> </ul>	<ul style="list-style-type: none"> <li>- E-Government</li> <li>- Informatization</li> <li>- U-I-G Linkages</li> <li>-GRI Restructuring</li> <li>- Science and high-tech parks in regional areas</li> <li>- Cyber Korea 21 (1998)</li> </ul>	<ul style="list-style-type: none"> <li>- Universities' Leading Role</li> <li>- Efficient NIS</li> <li>- RIS and Innovation Clusters Industrial Policy</li> <li>- promotion of basic research</li> <li>- HR development</li> </ul>	<ul style="list-style-type: none"> <li>- foster startup ecosystem</li> <li>- reinforce linkages in the NIS</li> <li>- increase impact of R&amp;D on commercialization and jobs</li> </ul>
Main Instruments	Subsidies, tax incentives, credit incentives, tariff rebates	Long-term policy loans at preferential rates with tax benefits; Public investment in human capital and infrastructure	R&D based subsidies and tax incentives, selection of players, restriction of foreign actors, choice of technology standards, direct investment, joint-ventures	PPPs; public procurements; technology transfer services (bridging institutes); joint investments	FDI, free economic zone, high-tech parks and business incubators, R&D PPPs	financial incentives for the venture capital market, tax incentives, regulation of financial innovations and use of fund-of-funds, green bonds

Source: Compilation by the author



### 3. The various speed ranges within the innovation bureaucracy

Once elected in 2013, President Park Geun-Hye's main political agenda was the 'Creative Economy', with the startup ecosystem as one of the main targets. Concretely, for the startups, it meant a substantial revamping of the state support for SMEs and technology-based projects (OECD, 2015). Beyond the numerous showcase programs and the discourse of novelty of these initiatives, this section examines the institutional dynamics this political agenda has been triggering.

The infrastructure supporting startups and SMEs is laid out with a special attention to the organizational features and the practices and representations of actors working for state agencies. Based on interviews across several state agencies in charge of SMEs and startups promotion, different institutional logics are identified: the 'Creative Economy' logic developed in the recent years, the 'dot-com' logic developed in the 2000s and the 'developmental state' one inherited from the industrialization period.

#### 3.1 The institutional logic of 'Creative Economy'.

The need for a new economic paradigm based on ICT is the main rationale of the 'Creative Economy' narrative<sup>2</sup>. Indeed, while the Korean national innovation system is getting closer to the technological frontier, its difficulties to prompt radical innovation are pointed out (Jones & Kim, 2014). Acting on the global consensus that ICT startups are the next source of growth, the Creative Economy designated the startup ecosystem as the main beneficiary of its innovation policy. Moreover, the Korean government has emphasized that, in contrast with past practices, the startup promotion policies rely exclusively on private actors and favor market competition. The Creative Economy was allocated 2% of the government budget in 2015 (\$7.4bn with a 17% increase year-on-year), including \$580 million dedicated to the startup ecosystem (+ 22% YOY) and \$970 million to startups and SMEs (+ 51%).

The Creative Economy agenda has unfolded as follows. The new programs directed to startups, part of the Creative Economy agenda, are administered by the Ministry of Science, ICT and Future Planning (MSIP),

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<sup>2</sup> The Creative Economy political agenda can be analyzed as a political narrative to the extent that it produces an analysis of socio-political and economic dynamics compounded with a political strategy and policy implications. In this sense, the Creative Economy narrative reveals representations and practices of dominant actors of the startup ecosystem, situated in the social space, that are constitutive of a type of institutional logic they convey and reproduce. The representations conveyed by the Creative Economy narrative are therefore supposed to have direct consequences on practices within the state.

the new 'super ministry' created by the President. Besides absorbing part of the Ministry of Knowledge Economy (MKE) and part of the Ministry of Education, Science, and Technology (Park & Leydesdorff, 2010), it also retrieved under its authority all the agencies implementing ICT policies. In a few years, the MSIP funded several private incubators, opened centers in partnership with top chaebols (Creative economy centers), created competition and managed to target high-growth startups. In particular, the emphasis has been put on the promotion of the venture capital (VC) industry through fund-of-funds (FOF) and matching fund approaches.

The Creative Economy centers are one of the main initiatives. In cooperation with local government and large firms, 18 Creative Economy Centers opened around the country. Another key program is the *Tech Incubator Programs* (TIPS), modeled after the Israeli *Yozma* Fund, which provides matching funds for startups invested into by venture capitalists through incubators (\$ 18M in 2015). Geographically, the startup ecosystem is concentrated in Seoul, especially in the Gangnam area with the "TIPS town", named after the government program TIPS. The other main space of the public support for startups is the "Pangyo Techno Valley" close to Seoul. Next to the local Creative Economy Center, the central government opened the "Startup Campus", a huge building providing working space for startups but also hosting some private incubating programs and government agencies (NIPA, Born2Global). This campus also hosts the K-program, a state incubating program designed as the *Y Combinator*, a famous private incubator located in the Silicon Valley. Startup incubators and accelerators built on this model have flourished since then, creating a denser network around startup activities. The private incubators are mainly non-profit organizations but are founded by large corporations. The Federation of banks founded Dcamp, Hyundai Heavy Industries founded MARU 180. Google campus also opened a subsidiary in Seoul.

At the organizational level, state agencies supporting startups underline that public programs do not give money directly to startups anymore and urge private actors to take a leading role. A project manager at the NIPA, a key agency of the Creative Economy agenda, stresses "*NIPA started in 2013; it does not give funds to startups directly. Our role is to create an ecosystem*". The recently created state agencies propose similar kinds of programs that all include: the selection of startups, the provision of space, mentoring and services. For example, 'Born2global' helps startups to develop overseas in partnership with dedicated agencies abroad, and the Korean Innovation Centers, which act as intermediaries of domestic agencies.

A manager at the KIC center in Silicon Valley, who used to work at NIPA, outlined his vision of the Creative Economy agenda and its activities:

*“A lot of things have been developed for three-four years. Before that, the focus was just on export, not the startup things. I think the startup things, including investment and VCs, all these kind of things date from this government... for the Korean government, on the economic side, exports are very important. The export and import consist of almost 95% of our GDP. Hence, our government thought it is very important to support SMEs to go overseas...”*

*Our main activity consists of two programs: an incubating program and an accelerating program...For the nesting program, we have around fifteen startups program that we are incubating for two months. They learn entrepreneurship here, and we help them with networking, pitching skills. We help them to go to all the meetups and educational events in the Silicon Valley area. For the accelerating program, we use our other location in SF. We have a co-working space there. We supported around twenty startups there. For this program, they are doing one-on-one mentoring with regional experts... The mentors are not Korean but local experts here working as VCs, angel investors or working for Google. They are helping the startups with their market validation, their business model, and sometimes they go out with startups to find potential customers.”*

The institutional logic of the state agencies directly implementing the ‘Creative Economy’ agenda is characterized by representations inspired by the Creative Economy narrative. Actors in those agencies are strongly influenced by this narrative, which leads them to emphasize the paradigm shift operated in the practices of the state towards indirect support. They also underline the novelty of this kind of policy, as if no support for innovative SMEs has ever existed before. Besides, the practices of state agencies are highly standardized based on international practices of other governments with the preference for indirect schemes, or direct schemes similar to those of private incubators.

### **3.2 The institutional logic inherited from the dot-com bubble**

While the ‘creative economy’ agencies are focused on new startup programs, the public support for startups is also provided through the existing infrastructure supporting SMEs. Many of these agencies were founded around the time of the 1997 Asian crisis and the dot-com bubble of the early 2000s. These agencies simultaneously embody the promotion of the ICT sector and the importance of balanced growth, between Seoul and the regions, between the central and local governments, and between chaebols and SMEs.

The institutional logic conveyed by 'dot-com' agencies is embedded in both the ICT national strategy that was launched during that time, and the large infrastructure dedicated to SMEs. One of the most iconic agencies from this period is the Small and Medium-sized Business Administration (SMBA), established in 1996. The SMBA was instrumental in both the post-1997 crisis to promote SMEs while the government was restructuring large firms, but also after the burst of the dot-com bubble. Indeed, Korea experienced a venture boom in the late 1990s, amid a domestic context of post-crisis recovery and an IT-driven rush in the US (Figure 1). From this period emerged the first generation of successful startups which are now major players in the ecosystem, such as Naver, Daum, and Gmarket, in the internet sector; or Nexon, NCsoft, Com2US, and Smilegate in the game and software industries. The SMBA, despite its low influence on political agenda and initiatives, has remained the historical counter of SMEs and VCs to get certified and receive public support. In the recent period, the SMBA, under the authority of the MOTIE, has had the largest budget devoted to startups and SMEs. Out of the \$19bn of government support to startups, 95% is allocated via the SMBA (Table 3).

On the contrary to the novelty emphasized by the Creative Economy one, the narrative bred within the SMBA shows the continuity of venture promotion since the late 1990s. In a 2013 report<sup>3</sup>, the SMBA distinguishes four historical periods: the 'beginning stage' (1986 – 1997), the 'booming stage' (1998 – 2001), the 'recessive stage' (2002 – 2004) and the 'reformation stage' (after 2005). The continuity of support and the capabilities of SMBA to adapt to a changing business environment are stressed. The main policy changes after the burst of the dot-com bubble were the shift to indirect policies, the creation of a fund-of-funds and the preference for "market-friendly certifications"<sup>4</sup>. Regarding certified ventures, statistics go against the Creative Economy narrative of a startup 'boom' since 2013. Indeed, we can see in Figure 1 that the growth rate of newly certified ventures was larger around 2010 than after 2013.

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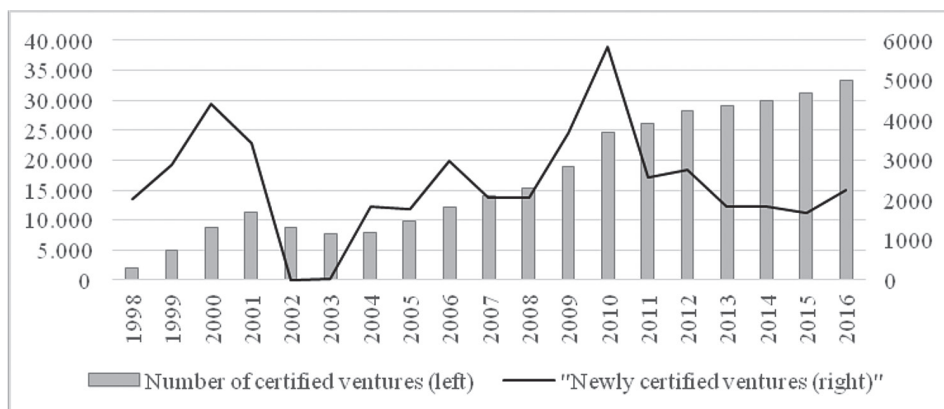
<sup>3</sup> Kim, JW & Kim H., (2013). *Korean Support System for Venture Business Creation*. Seoul: MOSF press.

<sup>4</sup> *ibid.*, p29

**Table 3.** Budget dedicated to startups by Ministry (2014-2016)

	2014	2015	2016
SMBA	95%	95%	95%
MSIP	4%	3%	4%
MOTIE	0%	0%	0%
Ministry of Culture, Sports, and Tourism	1%	1%	1%
Ministry of Employment and Labor	1%	0%	0%
Total Amount (\$)	\$19.1bn	\$22.2bn	\$20.1bn

Source: STEPI, 2016 Korea Entrepreneurship Monitoring, p13



**Figure 1.** Number of certified ventures

Source: Venture statistics system ' Venture In' .<sup>5</sup>

Other agencies, not affiliated to the SMBA, also emphasize the continuity of the infrastructure supporting startups. The first program supporting startups, the K-startup program, was crafted in 2010 by a small team of the Korea Internet and Security Agency (KISA). The KISA, created in 1996 under the umbrella of the Ministry of Information and Communication (MIC), has been part of the national ICT strategy described section 2.2, such as *Cyber Korea 21* (1999) and *e-Korea* (2002). In 2013, it was put under the authority of the MSIP. The K-startup program was designed based on the observation that many incubating spaces at the time were useless; it aimed at supporting early-startups with seed investment and

<sup>5</sup> Retrieved from <https://www.venturein.or.kr/venturein/data/C61100.do>. Access 3/16/2017

mentoring program, largely inspired by the *Y Combinator* experience. The program started experimentally and then became the main umbrella program and policy direction of the startup promotion policies of the Park administration.

Mr. A., a member of the team at the time, stresses that the pivotal moment when this program gained attraction from the central government happened when E. Schmidt, the president of Google, came to Korea.

*“When E. Schmidt visited Korea, he met the President. He said he was willing to give money to support the Korean ecosystem and they tried to find some programs, and they finally found our program and contacted us.”*

Mr. A describes a very bottom-up approach and an experimental phase when the program his team designed was scaled up to the national level. In the beginning, the program relied mainly on the expertise of large IT firms like Naver, Daum, Kakao, and Qualcomm, and benefited from contacts at the central government who helped in establishing partnerships with those large corporations.

The ‘dot-com’ type of institutional logic hinges on the strong belief in the knowledge-based economy paradigm, and its actors rely on technical practices and expertise. Due to their involvement in national ICT strategies, the agencies founded at that time gained technical capabilities and recognition from successive governments. Besides, the SMBA was allocated a significant firepower on the wake of the 1997 crisis, which has remained the main counter for SMEs, despite its lack of power regarding policy initiative.

### **3.3 The institutional logic of the developmental state**

Another pillar of the startup promotion policy are agencies founded during the catching-up period (1960-1980). The policy loan instrument designed during the developmental period was continued until the late 1990s. In 1997, commercial banks faced mandatory ratios of SME loans as high as 45% (Kang & Mah, 2015). Since then, access to finance for SMEs is mainly covered by the public financial institutions. More precisely, these are the public financial institutions that lend or guarantee credit to SMEs. There are two main agencies: the KODIT, founded in 1976, and the KOTEC, established in 1989. Their role is to alleviate the credit constraints of SMEs, especially technology-based SMEs in the case of KOTEC. The KOTEC was given a more important role in 1998 by taking on the venture certification process. These two agencies were actively

mobilized during the 1997 crisis, the dot-com bubble crash and the 2008 crisis. For example, the KOTEC guaranteed 100% bond obligations for new ventures from 2001 to 2002. The evaluations showed that credit guarantee agencies had a positive impact on firms supported in 2001 and 2002 on employment, sales, and survival, but not on R&D expenditures and productivity (Oh et al., 2009). Other actors of the public financial system are the Korea Development Bank (KDB) and the Korea Export-Import Agency (KEXIM), which are by far the biggest ones in terms of lending but are not strictly dedicated to SMEs (see Table 4).

**Table 4.** Total assets by public financial agency

	Total assets in 2015 (bn \$)	Compound annual average growth (2013-2015)
KODIT	8.5	4.2%
KOTECH	3.0	0.7%
KEXIM	72.9	10.3%
KDB	273.5	36.0%

Source: raw data from alio.go.kr (open data website for public institutions)

The role of these developmental agencies has somehow evolved. Nowadays, the KODIT is used more as a counter-cyclical instrument. While the growth rate of credit-guarantee used to be around 20% from 1980 to 1997, it has been stable ever since, apart from the period during the crisis. The share of loan guarantees remained stable from 2007 to 2014 (0.12% of outstanding SME business loans), according to OECD data. These developmental agencies emphasize continuity but, above all, their relevance and their capabilities to adapt to new challenges. For example, they all implement new programs designed particularly for startups. In its annual report of 2015, KDB<sup>7</sup> highlights its support to M&A and VC but puts its startup programs under the ‘social contribution’ section. KODIT, for its part, insists more on its role in promoting startups. In 2014, startups were defined as a priority sector, as exporting SMEs, and were given the largest share (37%) of the \$28 million dedicated to priority sectors in 2014<sup>8</sup>. The KOTEC refers to its innovative and leading role in ‘asset-based technology finance’ as its commitment to technology-based SMEs<sup>9</sup>.

<sup>6</sup> BoK exchange rate open/average 2015: ₩1131.49 won for \$1

<sup>7</sup> KDB (2015), KDB Annual report 2015. Retrieved from <https://www.kdb.co.kr/ih/wcms.do>.

<sup>8</sup> KODIT (2014), KODIT Annual report 2014, p23. Retrieved from [http://www.kodit.co.kr/html/english/inv\\_t\\_relation/annualReport.jsp](http://www.kodit.co.kr/html/english/inv_t_relation/annualReport.jsp).

<sup>9</sup> KOTEC (2014), KOTEC Annual report 2014, Retrieved from [http://www.kibo.or.kr/src/english/etc/images/kotec2014\\_annual\\_report.pdf](http://www.kibo.or.kr/src/english/etc/images/kotec2014_annual_report.pdf)



Mr. P., senior manager at the KOTEC, describes the main activities of the agency:

*“KOTEC focuses on the future possibility of technology rather than financial evaluation. Most of the startups have a weak track record; it is hard to find who is successful. [...] We help around sixty-five thousands companies, of which 38% are startups.*

*[...] We invest directly under the law, but we have a limitation of companies less than five years old because VCs do not like to invest in early stage startups. Only early stage and tech-based startups.*

*[Since President Park] the biggest change is that we have started to make TCI (Technology credit information system). Second, the Creative Economy, especially for SMEs. President Park Geun-Hye emphasizes the value of evaluating the technology. Before Park, SMEs got loans based on credit analysis, balance sheet; information asymmetry does not exist anymore. President Park said we have to support tech based SMEs.”*

The overall picture drawn by a senior researcher at the STEPI (public research institute in charge of S&T policies) is also informative of the representation of the policy goals behind the startup policies:

*“As you know, the government has supported a lot of different programs to boost our economy and the Knowledge Economy, and the President Park Geun-Hye, her administration, coined the term of Creative Economy. The unemployment rate of young people in Korea has been rising to 13-14%, so we have a lot of young people who do not have jobs. So, the ministries have been making some programs to create jobs and encourage large companies to make more jobs for young people. **The startup policies have started for this kind of reasons: making jobs for young people.***

*Before, in the late 1990s to 2000s, we also experienced the first venture boom, but after the early 2000s, the number of new ventures decreased, and just a few have survived. Now, it is the second trend of venture firms in Korea. It is different from the first venture boom. Nowadays, we do not need a lot of infrastructure or money to build large offices, thanks to IT technologies. [...] Korea is a small country, so the government has their role to do to boost the startup economy. The MSIP and the SMBA those two ministries are the major players to make the government programs to boost startup companies.”*

These excerpts reveal the ‘developmental state’ type of logic embedded in past practices, such as a large-scale approach to policy support and a socioeconomic goal of job creation. The relevance of the ‘developmental

state' agencies is reasserted by the innovative policy instruments they developed based on their broad technical capabilities. These agencies have been pouring money into the domestic economic structure for several decades; they have therefore benefited from economies of scale, which allowed them to develop their technical and monitoring capabilities. Given their historicity, actors within these agencies tend to downplay the Creative Economy narrative to a secondary position, limited to a general focus on technology.

This historical perspective on the institutional building process of the startup support infrastructure reveals the different institutional types of logic at play. The '*Creative Economy*' logic is inspired by international practices and the experience of the Silicon Valley (mimic of the *Y Combinator* programs) and Israel (fund-of-funds inspired by the *Yozma program*). The agencies created at the time of the '*dot-com bubble*' reflect the focus on SMEs and technology-based finance. Finally, the '*developmental*' agencies are mainly circumscribed to ease the financial constraint of SMEs and promote job creation. While the latter are not at the initiative of policies, their reach in the domestic economic structure is long, and they support a large share of the SMEs. Hence, the institutional logics are different, but the Creative Economy agenda seems to have an overall impact on the infrastructure supporting SMEs with incentives to develop programs targeting startups.

#### **4. The newer, the better? Knock-on effect of institutional layering**

This section interprets the presence of differential institutional types of logic and addresses its implications. In particular, analytical tools from institutional analysis are used to link institutional logic and institutional change. The co-occurrence of different types of logic points toward an institutional layering, which characterized a particular mode of change. The three types of logic identified in the previous section constitute institutional layers that are coordinated by the one of '*Creative Economy*'. Nevertheless, competing types of logic continue to exist, as state agencies from the late 1990s and the industrialization period are still a core part of the infrastructure supporting startups. It results that both coordination and contradiction emerge from this ongoing layering.

##### **4.1 The layering of the state apparatus: laying the ground for a transformative change?**

From the three periods of institution building related to SMEs policies and especially startups we can determine the dominant mode of change. The current institutional infrastructure is characterized by a domination of

newly created agencies with a sustained activity of prior organizations. The different institutional logics identified at the organizational level coalesce and co-evolve with the institutional level (Table 5). The state agencies mentioned are constitutive of the state economic apparatus and reflect its logic. As we have seen, the startup promotions policies are supplemented by an institutional infrastructure that has gradually evolved over time. One feature is the continuing presence of historical organizations inherited from both the developmental period and the post-1997 period. Indeed, the public finance agencies from the developmental period are still active, and the scope of their activity barely evolved (see KODIT, KOTEC, KDB). Similarly, agencies founded in the late 1990s have kept being engaged in the promotion of SMEs, especially those related to ICT development (see KISA, SMBA). In the more recent period, many agencies promoting startups were created, and some from the past were restructured (see the MSIP, the NIPA, and smaller agencies as born2global, KIC).

The mode of gradual institutional change identified is the one of layering. As described by Streeck and Thelen (2005), layering fills up a political need of not abruptly replacing historical institutions. Under the appearance of stability, the layering mode is an active political process that can bypass some lock-in effects. The dominant logic is the 'Creative Economy' logic, which is vibrant in the infrastructure supporting startups but more generally in the state economic apparatuses. This institutional logic homogenizes the behavior and routines of actors within state agencies and part of the innovation bureaucracy while echoing with actors outside it. The Creative Economy narrative is supported by the stakeholders of the startup ecosystem – the entrepreneurs, some large firms, venture capitalists, who consolidate into an institutional layer. Similarly, the progressively marginalized institutional logics of the 'developmental state' and the 'dot-com bubble' are sustained by other actors and relate to competing social orders that have fused in their respective institutional layers (Table 5). The relationship between these three layers (developmental, dot bubble, creative economy) is in-between coexistence and competition. Because the previous layers are still active, the continuity seems to prevail on the surface, but the new layer brings a gradual change by diffusing its institutional logic.

Despite the Creative Economy narrative of novelty, public policies and public infrastructure display many features of continuities. The one-term presidential regime tends to favor a spoils system driven by the new presidential agenda, but state apparatuses cannot be entirely restructured every five years. Thus, previous layers are used to navigate through new narratives. In 2013, with the election, ministries were restructured, along with the

existing balance of power. In regards to SMEs and high-tech entrepreneurship activities, the MSIP also took over the S&T aspects of the coordination of policies. The Ministry of Trade, Industry, and Energy (MOTIE) kept the initiatives on industry topics, and it oversaw the SMBA, while the financial part of the infrastructure, the developmental agencies as KODIT and KOTEC, remained under the Financial Service Commission (FSC). The FSC also has taken the initiative on supporting M&A and IPO through the 'Growth Ladder Fund' it administrates. The continuity can be illustrated by looking at policy support programs implemented as part of innovation and industrial policies by the major ministries and administrations. Out of 387 programs related to S&T, Industries, and SMEs, 23% of programs from the previous administration were stopped after Park's election, 47% were continued, and 30% were created<sup>10</sup>. The two newly created ministries (MSIP and MOTIE) undertook the larger share of the administration's policies, letting the SMBA in charge of only 5% of the new programs<sup>11</sup>. One straightforward consequence of this three-head configuration is the overlap of programs and the difficulties of coordination. To fix these shortcomings, the MSIP has put in charge the NIPA to coordinate all the programs under the ministry's authority (16 programs from 8 state agencies, representing \$96 million) and to progressively rationalize those depending on other ministries. The NIPA, founded in 1998, was completely restructured in 2013 when the new president picked it as a key agency for her political agenda. The director of NIPA instituted in 2013 was one of the closest counselors of the President. Other smaller agencies were founded, designed according to international practices, as Born2Global and Korea Innovation Centers that help Korean startups to launch or create partnerships abroad.

Evidence of continuities of programs and policies should not dismiss the analysis of a gradual, and still ongoing, institutional change. Indeed, significant changes come from the differentiated institutional logics within the public infrastructure supporting startups. The newer layer has had a knock-on effect on the older ones which unfold in a dual movement. First, the new layer has an active role in peripheralizing agencies set in past institutional logics. In particular, agencies from the 'developmental era' have lost ground on their participation in the political agenda, in the design of programs, and the scope of their role has tended to shrink. Second, past institutional layers reach out to the new one and tend to imitate it. In an attempt to outlast the Creative Economy narrative, the bottom layers associate their historical institutional logic with some elements of the new one. For example, every state agency is advertising

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<sup>10</sup> Source: raw data from <http://www.openfiscaldata.go.kr/>, calculation of the author based on budgets of individual programs by ministries and by year.

<sup>11</sup> Source: raw data from <http://www.openfiscaldata.go.kr/>, calculation of the author based on budgets of individual programs by ministries and by year.

about its programs specifically supporting startups, while those used to be included within SMEs programs.

The layering has not been completed yet; it is still ongoing in the sense that the three layers are co-existing. The new layer directs public support towards venture capital and entrepreneurship but still relies on the old layers to fund a bigger bulk of certified ventures. Indeed, public financial institutions have the largest strike force to support SMEs. Several reasons explain why the old layers have not disappeared yet. First, older layers are deeply embedded in the state apparatuses which, given internal bureaucratic dynamics, have prevented their disappearance over time. The remaining power of the developmental agencies can be illustrated by the step back in 2013 from KDB privatization plans. Second, these agencies provide a large-scale support that would be politically and socially costly to diminish. Hence, despite the repeated critics of international organizations (see IMF, 2016; OECD-ES, 2016) the level of support has been maintained at a high level<sup>12</sup>.

## 4.2 Implications of layering on the innovation bureaucracy

Several implications can be drawn from the layering mode of change and its consequences on the innovation bureaucracy and its organizational arrangements. First, the mode of change shed light on the complexity and entanglement of institutional processes at play, at different scales. The features of continuity within the innovation bureaucracy, such as the long-lasting existence of some state agencies, the persistence of some programs over time, mask the significant restructuring of the innovation bureaucracy. Continuity is not a path-dependent process; it is ensured and reproduced by political actors within the state agencies. The same goes for the processes of change. Actors shape as much as they are bound by the institutional logics they embody in their practices and representations. For instance, developmental agencies strive to remain pertinent while reaching the technological frontier. The agencies as KDB or the

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<sup>12</sup> Critics of the domestic SME support scheme can be found in several issues of IMF Article IV (since 2004) and OECD EDR. For example, the 2015 edition of IMF article IV points out the lagging productivity of SMEs: *"An un-dynamic SME sector [...] The sector is highly heterogeneous, but includes a myriad of unprofitable firms which, given the de facto social safety net role they play, are kept on life support through government guarantees, subsidies, and protections."* (p22). To which the Korean authorities replied: *"While staff proposes to phase out the credit guarantee support to SMEs, we note that the current SME credit guarantee support does not function as a life-support for unviable SMEs given that such support is predicated on the viability of an SME. Consideration also needs to be given to the fact that SMEs are a critical part of the value chain and also represent a de facto social safety net. We are systematically reviewing the SME credit guarantee system in order to enhance efficiency and eliminate redundancy among public guarantee providers."* Article IV 2015, Statement by KwangHae Choi, Alternate Executive Director for Korea and Il Young Park, Senior Advisor May 8, 2015

KODIT, dedicated to supporting the need for capital investment during the industrialization, are now tackling new challenges. Even though they are adapting to the dominant logic of Creative Economy, mostly by engaging in financial innovation, they have kept a broad spectrum approach to industrial policy.

The case of startup promotion policies also contributes to a better understanding of the organizational arrangements, and the construction of innovation capacities over time. The engine of the innovation bureaucracy has changed over the years. The EPB, the central agency of the developmental state, progressively lost its edge until its dismantlement. Different arrangements were tried out by the successive governments, but often with difficulty in coordinating already existing organizations by newly created ones. In the recent years, the inception of the first K-startup program by a small team of the KISA contributes to the argument of Breznitz & Ornston (2013) on the power of peripheral agencies. In this case, the position of the KISA as a leading technical agency, though outside of the government's reach, played a role in the possibility for a team to have such space to design new programs. The first draft of the K-startup was a side project for the team mentioned in the previous section, and the KISA had a flexible enough organizational structure to foster this kind of initiative. On the contrary to the cases analyzed by Breznitz & Ornston (2013), in which a peripheral agency is pulled-in to the core at the price of its flexibility, in this case only the program is emulated by the core, without any transformation of the KISA. The K-startup was pulled out of KISA to integrate the designated ministry in charge of S&T (the MSIP) and the team was promoted within the KISA but in other departments.

Besides, the knock-on effect of the 'Creative Economy' layer has consequences on the organizational variety within the innovation bureaucracy. The attraction exerted by the Creative Economy layer actually benefits from the tension between isomorphism and competition described by Karo & Kattel (2015). The organizational variety observed in the infrastructure supporting SMEs, with some coherence within the three layers, at the same time enables the capacity of the 'Creative Economy' layer while eroding the capacities of the 'developmental' and the 'dot-com' layers. To a certain extent, the S&T capabilities of the Korean political economy have been built on the 'developmental layer' and a constant strategy of upgrading, led by the new layers. The current process of layering tends to subdue organizations to the 'Creative Economy' institutional logic which weigh on the organizational variety of the innovation bureaucracy.

**Table 5.** Institutional layers of the infrastructure supporting SMEs

	INSTITUTIONAL LAYERS		
	Developmental state	Dot-com	Creative Economy
<b>Socio-political compromises</b>	Authoritarian regime with a vision of state-led catching up	Economic and political liberalization, rebalancing growth	Inefficiencies of the national innovation system, fear of hollowing out, social tensions
<b>Leading private actors</b>	Large conglomerates	IT firms, SMEs, civil society	IT firms, entrepreneurs, venture capitalists
<b>Main functions</b>	Long-term investment, management of strategic resources	Furthering knowledge frontier, diffusion of new skills and technology, deepening of technology base	Generating demand for new products and services, Deepening technology base, Furthering knowledge frontier
<b>Institutional logic</b>	<ul style="list-style-type: none"> <li>- large scale approach</li> <li>- importance of long-term growth</li> <li>- monitoring capabilities</li> </ul>	<ul style="list-style-type: none"> <li>- technical skills and expertise</li> <li>- Knowledge-Based Economy</li> <li>- decentralization / deconcentration</li> </ul>	<ul style="list-style-type: none"> <li>- international best practices</li> <li>- Creative Economy paradigm</li> <li>- business skills and networking</li> </ul>
<b>Innovation Bureaucracy</b>	KDB, KODIT, KOTECH, STEPI	SMBA, KISA	MSIP, NIPA, CCEI

Source: author

## Conclusion

This article has provided a long-term perspective on the building of state innovation capacities since the 1960s in Korea in order to shift the attention from the objectives of innovation policies to their concrete implementation. The main feature identified was the transformation of the innovation bureaucracy from a central piloting agency at the core of the catching-up period towards a more diverse organizational structure in the late 1980s. The Korean innovation system has since got closer to the technological frontier, and problems arose from an underperforming coordination within the innovation bureaucracy and the weak linkages between actors (OECD – STI, 2014). The central government has strived to decentralize the innovation bureaucracy in the 2000s while providing a more horizontal support for targeted sectors, such as biotech, green energy and, more recently, IoT. The whole state economic apparatus has been mobilized by those policies, from the public financial agencies inherited from the developmental state period to the agencies specialized in SMEs support, in addition to new agencies conceived in imitation of international practices.



This work contributes to the understanding of the transformation of the state innovation capacities. Beyond the appearance of both organizational variety and continuity of the developmental state, a closer look to institutional dynamics has pinpointed the gradual but significant institutional change of the state economic apparatuses. Based on a careful analysis of practices and representations of actors of the innovation bureaucracy, the heterogeneity of institutional logics at play within the innovation bureaucracy has been outlined. It is possible to differentiate between three different institutional types of logic at play: the 'creative economy', the 'dot-com', and the 'developmental state', respectively. The Creative Economy agenda has fostered a new institutional logic inside the state agencies devoted to it. Yet, this agenda is backed by the existing infrastructure supporting SMEs and the ICT sector, which operates under other institutional logics. These differential institutional logics characterize a layering mode of change which aims at diluting former institutional arrangements. While former layers are not completely overcome, the 'Creative Economy' layer has a knock-on effect upon them, which further provokes implications on organizational variety and state innovation capacity.

The findings clearly indicate that decreasing organizational variety is related to a loss of state innovation capacity, given the new governance regime of industrial policies. The ongoing layering process weights on the organizational variety by fostering, through the 'Creative Economy' logic, an organizational isomorphism across institutional layers. Each layer embodies a type of dominant organizational arrangement with tradeoffs in terms of state innovation capacity. When looking at the infrastructure supporting the startups, the 'developmental state' layer is characterized by large-scale agencies, mainly dedicated to long-term investment. The 'dot-com' layer has produced agencies dedicated to SMEs and ICT with a more peripheral bureaucracy. Then, the 'Creative Economy' layer favors more flexible and mission-oriented structure. Besides, this layer has revamped specialized bureaucracies for purposes of coordination. What's more, organizational arrangements cannot have only innovative organizations; a backbone is needed to undertake some large-scale or long-term functions. So far though, the layering has hit the ceiling because some organizations are socially costly to replace; such is the case of Korea Development Bank, which is not only a symbol of the fast industrialization period with associated political forces, but also a source of public jobs. Nevertheless, the knock-on effect of the 'Creative Economy' layer is expected to put more pressure on the past layers in the future. Another consequence of the loss of organizational variety comes from the distribution of the 'risk-reward nexus' (Lazonick & Mazzucato, 2013). The increasing number of indirect schemes, like those directed to the venture

capital industry, does not reward adequately public organizations that bear the risk while private financiers get rewarded. As a consequence, a policy recommendation of preserving organizational variety as well as schemes ensuring a fair distribution of risk and reward can be drawn from this paper.

Further research could usefully explore the balance of power fostered by the 'Creative Economy' layer driving the institutional and organizational dynamics. There are different temporalities within the state apparatuses, which allow political compromises to crystallize in such way that they are difficult to revoke by the new dominant social forces. Therefore, an analysis of political processes would contribute to a better understanding of the institutional layering and the resistance of the developmental layer.

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## References

- Ahn, Hyeon-Ju, and Jai S. Mah. "Development of technology-intensive industries in Korea." *Journal of Contemporary Asia* (Taylor & Francis) 37 (2007): 364-379.
- Amsden, Alice. *Asia's next giant: South Korea and late industrialization*. Oxford University Press, 1989.
- Andreoni, Antonio. "Varieties of industrial policy: models, packages, and transformation cycles." In *Efficiency, Finance, and Varieties of Industrial Policy: Guiding Resources, Learning, and Technology for Sustained Growth*, 245-305. Columbia University Press, 2017.
- Block, Fred. "Swimming against the current: The rise of a hidden developmental state in the United States." *Politics & society* (Sage Publications Sage CA: Los Angeles, CA) 36 (2008): 169-206.
- Block, Fred, and Peter Evans. *The state and the economy*. Vol. 2, in *The handbook of economic sociology*, edited by Neil J. Smelser and Richard Swedberg, 505-526. Princeton: Princeton University Press, 2005.
- Breschi, Stefano, and Francesco Lissoni. "Knowledge spillovers and local innovation systems: a critical survey." *Industrial and corporate change* (Oxford University Press) 10 (2001): 975-1005.
- Breznitz, Dan. *Innovation and the state: Political choice and strategies for growth in Israel, Taiwan, and Ireland*. Yale University Press, 2007.
- Breznitz, Dan, and Darius Ornston. "The revolutionary power of peripheral agencies: Explaining radical policy innovation in Finland and Israel." *Comparative Political Studies* (SAGE Publications Sage CA: Los Angeles, CA) 46 (2013): 1219-1245.
- Chang, Ha-Joon. "An institutional perspective on the role of the state: towards an institutional political economy." In *Institutions and the Role of the State*, edited by Leonardo Burlamaqui, Ana Célia Castro and Ha-Joon Chang, 3-26. Cheltenham: Edward Elgar Publishing, 2000.
- Chang, Ha-Joon, and Peter Evans. "The Role of Institutions in Economic Change." *Paper presented at the conference The Other Canon and Economic Development*. Oslo, 2000.
- Chang, Ha-Joon, Antoni Andreoni, and Ming Leong Kuan. "International industrial policy experiences and the lessons for the UK." Future of Manufacturing Project: Evidence Paper 4, UK Government Office for Science, 2013.
- Chibber, Vivek. "Bureaucratic Rationality and the Developmental State 1." *American Journal of Sociology* (The University of Chicago Press) 107 (2002): 951-989.
- Choi, Byung-Sun. "The structure of the economic policy-making institutions in Korea and the strategic role of the Economic Planning

- Board (EPB)." (Graduate School of Public Administration, Seoul National University) 1987.
- Choi, Hyundo, Sangook Park, and Jeong-dong Lee. "Government-driven knowledge networks as precursors to emerging sectors: a case of the hydrogen energy sector in Korea." *Industrial and Corporate Change* (Oxford University Press) 20 (2011): 751-787.
- Christensen, Tom, and Per Laegreid. *New public management: the transformation of ideas and practice*. Ashgate Pub Limited, 2002.
- Chu, Yin-wah. "Developmental Alliance in Korea and Taiwan: Trajectories of Transitions in the aftermath of Democratization." *Critique Internationale* 63 (2014).
- Chung, Hoe Hoon. "Lessons from the Korea Venture Industry development." *World Bank*, 2005.
- Chung, Sungchul. "Innovation, competitiveness, and growth: Korean experiences." In *Global Annual World Bank Conference on Development Economics 2010*, edited by Justin Yifu Lin and Boris Pleskovic, 333. The World Bank, 2011.
- Cooke, Philip, Mikel Gomez Uranga, and Goio Etxebarria. "Regional innovation systems: Institutional and organisational dimensions." *Research policy* (Elsevier) 26 (1997): 475-491.
- Crisuolo, Chiara, Peter N. Gal, and Carlo Menon. "The dynamics of employment growth." *OECD Science, Technology and Industry Policy Papers* (OECD Publishing), 2014.
- Debanes, Pauline, and Sébastien (eds) Lechevalier. "Towards a Revival of the Developmental State in Asia?" *Special issue of Critique Internationale* 63 (2014).
- DiMaggio, Paul J., and Walter W. Powell. "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields." *American Sociological Review* 48 (1983): 147-160.
- Dosi, Giovanni, Marco Faillo, and Luigi Marengo. "Organizational Capabilities, Patterns of Knowledge Accumulation and Governance Structures in Business Firms: An Introduction." *Organization Studies* 29 (2008): 1165-1185.
- Dosi, Giovanni, Richard R.Nelson, and Sidney G.Winter. "Introduction." In *The Nature and Dynamics of Organizational Capabilities*, edited by Giovanni Dosi, Richard R.Nelson and Sidney G.Winter, 1-22. Oxford University Press, 2000.
- Edquist, Charles. *Systems of innovation: technologies, institutions, and organizations*. Edited by Charles Edquist. Routledge, 2005 [1997].
- Evans, Peter. "The state as problem and solution: predation, embedded autonomy, and structural change." In *The politics of economic adjustment*, edited by S. Haggard and R. Kaufman, 139-181. Princeton, NJ: Princeton University Press, 1992.
- Freeman, Christopher. *Technology Policy and Economic Performance. Lessons from Japan*. London: Pinter Publishers, 1987.

- Freeman, Christopher. "The 'National System of Innovation' in historical perspective." *Cambridge Journal of Economics* (CPES) 19 (1995): 5-24.
- Haggard, Stephan, Wonhyuk Lim, and Euysung Kim. *Economic crisis and corporate restructuring in Korea: Reforming the Chaebol*. Cambridge University Press, 2003.
- Hall, Peter A., and Kathleen Thelen. "Institutional change in varieties of capitalism." *Socio-economic review* (SASE) 7 (2009): 7-34.
- Hall, Peter A., and D. Soskice. *Varieties of capitalism: The institutional foundations of comparative advantage*. Oxford: Oxford University Press, 2001.
- Hollingsworth, J. Rogers. "Doing institutional analysis: implications for the study of innovations." *Review of international political economy* (Taylor & Francis) 7 (2000): 595-644.
- Hollingsworth, J. Rogers, and Robert Boyer. "Coordination of economic actors and social systems of production." In *Contemporary capitalism: the embeddedness of institutions*, 1-47. Cambridge University Press Cambridge, 1997.
- Hwang, Kelley K. "South Korea's bureaucracy and the informal politics of economic development." *Asian Survey* (University of California Press Journals) 36 (1996): 306-319.
- IMF. *Republic of Korea: 2016 Article IV Consultation? Staff Report and Public Information*. IMF Publishing, 2016.
- Jackson, Gregory, and Richard Deeg. "From comparing capitalisms to the politics of institutional change." *Review of international political economy* (Taylor & Francis) 15 (2008): 680-709.
- Johnson, Chalmers. *MITI and the Japanese miracle: the growth of industrial policy, 1925-1975*. Stanford, CA: Stanford University Press, 1982.
- Jones, Randall S., and Myungkyoo Kim. "Fostering a creative economy to drive Korean growth." *OECD Economics Department Working Papers* (OECD Publishing), 2014: 38.
- Kang, Hyein, and Jai S. Mah. "R&D Policy for Small and Medium-sized Enterprises in Korea." *Science Technology & Society* (SAGE Publications) 20 (2015): 1-20.
- Karo, Erkki, and Rainer Kattel. "Innovation and the State: Thinking of Government as 'Technology Maker' and Implications for Public Administration Research." *Administrative Culture* 17 (2016): 5-17.
- Karo, Erkki, and Rainer Kattel. "Innovation Bureaucracy: Does the organization of government matter when promoting innovation?" *Papers in Innovation Studies* (Lund University, CIRCLE-Center for Innovation, Research and Competences in the Learning Economy) 38 (2015).

- Karo, Erkki, and Rainer Kattel. "Public management, policy capacity, innovation and development." *Revista de Economia Política* (SciELO Brasil) 34 (2014): 80-102.
- Kettl, Donald F. "Public bureaucracies." Chap. 19 in *The Oxford handbook of political institutions*, edited by Rod A. W. Rhodes, Sarah A. Binder and Bert A. Rockman, 366-384. Oxford University Press, 2006.
- Kim, Hongbum, Dong-Hee Shin, and Deaho Lee. "A socio-technical analysis of software policy in Korea: Towards a central role for building ICT ecosystems." *Telecommunications Policy* (Elsevier) 39 (2015): 944-956.
- Kim, Linsu. "Building technological capability for industrialization: analytical frameworks and Korea's experience." *Industrial and corporate change* (Oxford University Press) 8 (1999): 111-136.
- Kim, Linsu. "National System of Industrial Innovation: Dynamic of capability Building in Korea." In *National innovation systems: a comparative analysis*, edited by Richard R. Nelson. Oxford university press, 1993.
- Kim, Linsu, and Carl J. Dahlman. "Technology policy for industrialization: An integrative framework and Korea's experience." *Research Policy* (Elsevier) 21 (1992): 357-452.
- Kim, Sung-Young. "The politics of technological upgrading in South Korea: how government and business challenged the might of qualcomm." *New Political Economy* (Taylor & Francis) 17 (2012): 293-312.
- Larson, James F., and Jaemin Park. "From developmental to network state: Government restructuring and ICT-led innovation in Korea." *Telecommunications Policy* (Elsevier) 38 (2014): 344-359.
- Lazonick, William, and Mariana Mazzucato. "The risk-reward nexus in the innovation-inequality relationship: who takes the risks? Who gets the rewards?" *Industrial and Corporate Change* (Oxford Univ Press) 22 (2013): 1093-1128.
- Lee, Hyungho, and Sang-Young Han. "The evolution of the national innovation system in the Korean mobile telecommunication industry." *Communications & Strategies* 48 (2002): 161-186.
- Lee, Kwang-Suk. "A final flowering of the developmental state: The IT policy experiment of the Korean Information Infrastructure, 1995-2005." *Government Information Quarterly* (Elsevier) 26 (2009): 567-576.
- Lee, Yong-Sook, Ying-Chian Tee, and Dong-wan Kim. "Endogenous versus exogenous development: a comparative study of biotechnology industry cluster policies in South Korea and Singapore." *Environment and Planning C: Government and Policy* (SAGE Publications) 27 (2009): 612-631.



- Lilischkis, Stefan. "Policies in support of high-growth innovative SMEs." *INNO-Grips Policy Brief 2* (2011).
- Luedde-Neurath, Richard. "State intervention and export-oriented development in South Korea." In *Developmental States in East Asia*, edited by Gordon White, 68-112. Springer, 1988.
- Lundvall, Bengt-Ake. "National systems of innovation: An analytical framework." *London: Pinter*, 1992.
- Mahoney, James, and Kathleen Thelen. "A theory of gradual institutional change." *Explaining institutional change: Ambiguity, agency, and power* 1 (2010).
- Mazzucato, Mariana. "A mission-oriented approach to building the entrepreneurial state." (Innovate UK) 2015.
- Mazzucato, Mariana. "The entrepreneurial state: Debunking the public vs. private myth in risk and innovation." *Anthem, London*, 2013.
- Minns, John. "Of miracles and models: the rise and decline of the developmental state in South Korea." *Third World Quarterly* (Taylor & Francis) 22 (2001): 1025-1043.
- Mintzberg, Henry. *Mintzberg on management: Inside our strange world of organizations*. Simon and Schuster, 1989.
- Morgan, Glenn, John Campbell, Colin Crouch, Ove Kaj Pedersen, and Richard Whitley. *The Oxford handbook of comparative institutional analysis*. Edited by Glenn Morgan, John Campbell, Colin Crouch, Ove Kaj Pedersen and Richard Whitley. OUP Oxford, 2010.
- Nelson, Richard R. *National innovation systems: a comparative analysis*. Oxford university press, 1993.
- OECD. "Korea- policy priorities for a dynamic, inclusive and creative economy." *Better Policies? Series* October (2015).
- . *Start-up Latin America: Promoting Innovation in the Region*. Paris: OECD Publishing, 2013.
- OECD-Entrepreneurship. *Entrepreneurship at a Glance 2016*. Paris: OECD Publishing, 2016.
- OECD-ES. *OECD Economic Surveys: Korea 2016*. Paris: OECD Publishing, 2016.
- OECD-STI. *OECD Science, Technology and Industry Outlook 2014*. Paris: OECD Publishing, 2014.
- Oh, Inha, Jeong-Dong Lee, Almas Heshmati, and Gyoung-Gyu Choi. "Evaluation of credit guarantee policy using propensity score matching." *Small Business Economics* (Springer) 33 (2009): 335-351.
- O'Riain, Sean. "Dominance and change in the global computer industry: military, bureaucratic, and network state developmentalisms." *Studies in Comparative International Development* (Springer) 41 (2006): 76-98.



- . *The politics of high tech growth: Developmental network states in the global economy*. Cambridge University Press, 2004.
- Park, Han Woo, and Loet Leydesdorff. "Longitudinal trends in networks of university--industry--government relations in South Korea: The role of programmatic incentives." *Research policy* (Elsevier) 39 (2010): 640-649.
- Park, Sam Ock. "Regional innovation strategies in the knowledge-based economy." *GeoJournal* (Springer) 53 (2001): 29-38.
- Park, Tae-Young. "How a latecomer succeeded in a complex product system industry: three case studies in the Korean telecommunication systems." *Industrial and corporate change* (Oxford University Press) 22 (2012): 363-396.
- Pirie, Iain. "Economic crisis and the construction of a neo-liberal regulatory regime in Korea." *Competition & Change* (Maney Publishing) 10 (2006): 49-71.
- . *The Korean developmental state: From dirigisme to neo-liberalism*. Routledge, 2008.
- Seong, Jieun, and Wichin Song. "Innovation policy and administration system in the era of post catch-up: The case of the Roh Moo-hyun administration's innovation policy." *Asian Journal of Technology Innovation* (Taylor & Francis) 16 (2008): 25-46.
- Shin, Jang-Sup, and Ha-Joon Chang. *Restructuring Korea Inc.: Financial Crisis, Corporate Reform, and Institutional Transition*. Routledge, 2003.
- Streeck, Wolfgang, and Kathleen Thelen. *Beyond continuity: Institutional change in advanced political economies*. Oxford University Press, 2005.
- Teece, David, and Gary Pisano. "The dynamic capabilities of firms: an introduction." *Industrial and corporate change* (Oxford University Press) 3 (1994): 537-556.
- Thurbon, Elizabeth. *Developmental Mindset: The Revival of Financial Activism in South Korea*. Cornell University Press, 2016.
- Thurbon, Elizabeth. "The resurgence of the Developmental State : a conceptual defence." *Critique Internationale* 63 (2014).
- Wade, Robert. *Governing the market*. Princeton, NJ: Princeton University Press, 1990.
- Winter, Sidney G. "Understanding dynamic capabilities." *Strategic Management Journal* (John Wiley & Sons, Ltd.) 24 (2003): 991-995.
- Wong, Joseph. "The adaptive developmental state in East Asia." *Journal of East Asian Studies* (Lynne Rienner Publishers) 4 (2004): 345-362.

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