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TARGETED INDUSTRIAL POLICY AND GOVERNMENT FAILURES: INSIGHTS FROM THE
SOUTH KOREAN EXPERIENCE

Targeted industrial policy and government failures: insights from the South Korean experience

Targeted
industrial policy
and government
failures

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Abstract

Purpose – The purpose of this paper is to reflect on the efficiency and effectiveness of industrial policies by focusing on the peculiar experience of South Korea. It analyzes Korean structural change from a historical and empirical standpoint, highlighting industrial policy interventions involved in this process. The analysis presented offers important insights to inform the debate on the contemporary industrial policy, identifying specific elements and circumstances that can contribute to mitigate government failures and to improve the effectiveness of public action.

Design/methodology/approach – The paper adopts a historical and empirical perspective. Concerning the empirical analysis, a composite indicator to assess the process of structural change of economies is presented. This methodology provides annual rankings based on the different economic relevance of the manufacturing sectors over the period 1963–2012.

Findings – The paper shows that industrial policy has been extensively involved in South Korean structural development but public intervention interacted with several other factors, including gradual markets liberalization, education, societal and cultural characteristics and low level of income inequalities. As a result, economic development is conceived as systemic process, namely as the outcome of a balance in the roles played by government, markets and civil society. In this framework, government failures, as inability of the government to respond effectively and efficiently to the general interest of the society, are intimately inherent to the mechanisms that rule the relevant relationships within the system.

Originality/value – In the post-crisis debate, very little attention has been devoted in academic and political debate to the ways to mitigate government failures. By analyzing the historical and recent Korean experience with industrial policy, the paper addresses an issue insufficiently analyzed offering an innovative contribution.

Keywords South Korea, Composite indicator, Industrial policy, Industrial development, Government failures

Paper type Research paper

1. Introduction

One of the effects of the 2008 Global Crisis has been to re-open at political and academic level the debate on the role of the government in contemporary economies. After an epoch of liberalizations, privatizations and reduction of the government's role in economic dynamics, a rejuvenation of industrial policies (Stiglitz and Lin, 2013) has characterized public action in many industrialized and emerging countries in an attempt to address short-term and structural problems raised by the recession (Bianchi and Labory, 2011; Cowling and Tomlinson, 2011; Lin, 2012; Mazzucato, 2013; Stiglitz and Lin, 2013; Di Tommaso and Schweitzer, 2013;



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Tassinari *et al.*, 2018; Tassinari, 2019). In this context, however, very little attention has been devoted to new ways to mitigate severe government failures.

The government failures' literature, emerged during the last 40 years, highlights the weaknesses of the public action and shows circumstances in which costs of industrial policy can be higher than its benefits. On the one hand, the risk that selective industrial policy responds to particular interests, and not to more general public interest, is extremely high. Stimulus to rent-seeking activities, corruption and nepotism are just some of the points stressed at theoretical level to exclude industrial policy from the political agenda. On the other hand, industrial policy risks failing simply because of a lack of information on the targets. For example, possible inability of governments to "pick the winners" capable of competing in markets and protection given to inefficient firms can generate enormous waste of public money with poor long-term benefit for the society (Krueger 1990; Chang 1994; Lerner, 2009; Di Tommaso and Schweitzer, 2013; Schuck, 2014).

In this context, industrial policy continues to be implemented as an answer to economic and social problems in many countries whereas its supporting theory appears often inadequate to explain how, why and when such intervention could be desirable or not. Very little space has been left to rigorous analysis of industrial practices around the world, with the aim of genuinely understanding source of success and failure of the public intervention in different economic, historical and cultural contexts.

This paper focuses on the development experience of South Korea in order to inform the current debate on industrial policy. Indeed, the Korean case has attracted huge attention from academic and political observers (see, e.g. Woo, 1991; Lie, 1998; Mo and Weingast, 2013; Unger and Chan, 2015; Oh and Jun, 2016). From agricultural economy in 1950s, a "big push" is occurred in 1960s and 1970s which has led South Korea to be one of the most competitive industrialized economies of the world. This impressive structural development has been interpreted in various ways in academic literature, and it seems clear that there is not unanimity about the factors that have contributed to the economic development of the country. While the dispute lays mainly on the ancient antagonism "State vs Market," this paper aims at going beyond a dichotomist approach by analyzing Korean industrial development as outcome of the relationship between government, markets and civil society, in a systemic process interacting with peculiar economic and historical circumstances, founding the success or failure of development actions. The historical and empirical analysis presented in the work offers insights to inform the debate on the contemporary industrial policy, identifying specific elements and conditions that can contribute to mitigate government failures and to improve the effectiveness of the public action.

The paper is structured as follows. The next section outlines the main theories on South Korean industrial development. The neoclassical view, the developmental state approach and the culturalist view are considered as the main competing theories. Section 3 provides a historical overview of the Korean industrialization, from the period of the dictatorship that ruled the country in 1960s and 1970s up to the Crisis of 2008. Section 4 analyzes the recent industrial strategy and the new paradigm of the Creative Economy, which is generally defined as an economic system based on creative products, where people's creativity is the main source of economic value (Howkins, 2001). Section 5 aims at assessing empirically the process of South Korea's structural change. It presents the construction of a composite indicator, in order to empirically analyze the industrial evolution of the Korean economy over time. Section 6 provides concluding remarks focusing on the possible sources of success and failures of government action in South Korean industrial development.

2. Competing theories on South Korean industrialization: an overview

The South Korean economic development has been interpreted in various ways in academic literature. This section aims to briefly present the main theories explaining the factors that

have contributed to the economic development of the country. In particular, we highlight the essential features of three interpretations: the neoclassical approach, the developmental state approach and the culturalist approach.

The neoclassical approach focuses on the functioning of market mechanism and argues that the Korean development might be explained using the traditional catch-up theory. According to this approach, Korea's development experience is essentially based on the mobilization of inputs and trade liberalizations, which generate an increase in exports and investments. In this framework, Krugman (1994) and Young (1995) use the neoclassical model of "growth accounting" to explain the sources of economic development in South Korea, Hong Kong, Singapore and Taiwan. In this model, capital stock, amount of work and technology are the determinants of growth, while the effects of government industrial policies should be substantiated by improvements in technology and efficiency, namely in increments of so-called total factor productivity (TFP). The authors come to similar conclusions: the growth of the "Asian tigers" has nothing extraordinary, given that it is largely due to a huge increase in capital and labor factors. The role of the public policy was, moreover, marginal given the low growth of TFP, indicating a modest technological progress. Young (1995) in particular argues that "neoclassical growth theory [...] can explain most of the difference between the performance of the newly industrializing countries (NICs) and that of other postwar economies" (p. 175). In this context, in line with the neoclassical approach, the market-friendly view emphasizes that the reliance on exports was the key of success of South Korean industrialization, and that the economic growth got started only when Korean firms were able to compete on international markets (Balassa, 1988; Krueger, 1990). According to this interpretation, the process of internationalization led to higher levels of efficiency for Korean firms and to the reallocations of productive factors in sectors characterized by comparative advantage. In this framework, the most important assignment for the state was to remove tariffs and other constraints to trade. As for the internal affairs, the state ought to restrict its action to correcting situations of market failure. In other words, public policies were fundamental as far as they keep a good investment climate (Stiglitz, 1996). In this context, the government's role would be limited to providing adequate infrastructure, maintaining macroeconomic stability and promoting investment in physical and human capital. Other measures to promote specific industrial sectors, such as support for heavy industries in Korea, would have been ineffective both from the point of view of the evolution of the industrial structure and from the point of view of technical progress (Krueger, 1990, p. 110; World Bank, 1993, p. 312). Holcombe (2013) is even clearer in his judgment on the role of the state, stating that the government incentives have not only been ineffective, but should have been avoided. This is because public resources have gone to the business realities that in the past had proven innovative and competitive but, in the long run, this type of industrial policy would hold back economic growth, preventing those who kept innovating from competing with the incumbents on equal conditions. In this sense, the merits of the miracle are related to the great abundance of workforce and to the low level of labor costs at the beginning of the 1960s. Like other developing countries, South Korea could take advantage of its low level of capital accumulation combined with the decreasing returns to scale of the capital in order to catch up rapidly on advanced economies. Evidence for this hypothesis would be the fact that the economic growth decelerated as the process of convergence went on. In this context, the role of the state, which implemented measures of import substitution and export promotion, has been totally ineffective (or even counterproductive according to some scholars).

On the contrary, the developmental state approach emphasizes the role of industrial policies. It asserts that without government intervention it would not have been possible for Korean firms to face the competition on international markets (Chang, 1994; Di Maio, 2009). The developmental state can be defined as a complex organization, featured by the

collaboration between an expert bureaucratic apparatus and the private sector, which aims to achieve pre-established economic and social development objectives (Amsden, 2001; Doner *et al.*, 2005). In this context, public incentives and subsidies were necessary to allow firms to acquire and use advanced technologies from industrialized countries. A mechanism of reciprocal control between the private sector and the bureaucracy was set to give to the bureaucratic agencies control over the economic performances of firms, which in turn received subsidies of different nature (e.g. fiscal benefits, preferential loans, support by public funding programs). These kinds of subsidies were granted on condition that firms managed to achieve specific prearranged standards (Amsden, 2001).

Finally, some other researchers have also studied the relationship between economic development and specific characteristics of the Korean society, related to the solid Confucian tradition, high quality of education and exceptionally low levels of income and wealth inequality. Specifically, this so-called culturalist approach emphasizes the relevance of the Confucian doctrine in Korean economic development, which promoted meritocracy, morality, honesty and competence in the bureaucratic body and civil society, encouraging investments in education, equality and hard work in economic life as social values (see, e.g. Bertoldi, 1996).

3. The historical evolution of South Korean industrial policies

3.1 The Korean economy during the Japanese domination and the military rule

Korean peninsula had been part of the Japanese empire since the first decades of the twentieth century. Under the Japanese colonial government, Korea moved its first steps toward industrialization. Despite agriculture remained the main economic activity of the country, which still had a medieval organization, some factories were built, along with some transport, financial and commercial infrastructure (Amsden, 1989; Kim and Koh, 2010). Other relevant changes of this period were the introduction of a judicial system and of an education system.

When the USA took control of the southern part of the country after the Second World War, establishing the modern state of South Korea, agricultural land reform was its first concern. The reform enhanced the distribution of lands and incomes laying the bases for the rise of the entrepreneurial middle class that would have been crucial for the future economic development (Amsden, 1989; Suh and Chen, 2007). Indeed, increasing equality in income distribution and in general level of education since the Japanese domination were creating a system founding on a civil society ready to actively participate to the economic and political life of the country. In this setting the development trajectory of the country could have been defined starting from a convergence of interests within the Korean society toward industrial development, as a rather homogeneous collective goal to pursue.

Despite the US influence that was promoting markets liberalization, the first republican government led by Syngman Rhee intervened in favor of light industries, by introducing protectionist measures against competitive imports. But it was with the General Park Chung-hee's military rule that South Korea started a radical process of industrialization. A student revolution in 1960 overthrowing the previous Syngman Rhee's (corrupt) government and the subsequent Park's military coup of 1961 placed economic modernization at the top of the Korean political agenda (see, e.g. Lim, 2012). Indeed, the popular pressures of that time were forceful in constraining any new government to create new institutions and implement a development strategy for the country.

Park administration's strategy for economic growth envisaged a fundamental role for large enterprises. Essentially, the role of the government was aimed to foster the growth of large industrial groups by defining economic plans through which it could coordinate investments and check results reached by the private economic agents. In this context, the government began to implement import substitution and export promotion measures by

allocating important public resources to long-term investment plans, incentives and subsidies for manufacturing companies (sacrificing short-term social spending) (Amsden, 1989). Indeed, the government's main aim was to make South Korea an independent economy by substituting foreign goods with national productions (Chang, 1994).

However, at the beginning of 1960s, the Korean industrial structure was mainly characterized by light industries (and in particular textile sector) that were the most important source of value added (see Table I). On the one hand, these sectors were an important springboard for economic development and started initially to be foster by the government, since they required less expensive investments and labor force compared to the heavy industries. On the other hand, in order to upgrade light industries, South Korea needed to import capital goods, machineries and technology from abroad that were lacking in the national economy (Colman and Nixon, 1994). Therefore, technology was purchased from industrialized countries, even if in many cases South Korea did not have the necessary skills to apply it. In this framework government's subsidies were crucial to cover the costs of acquiring this "social capital" (as Abramovitz (1986) called all these competences) that could also be higher than the benefits deriving from having advanced low-cost production methods (Khan and Blankenburg, 2009).

Indeed, the presence of public subsidies for promoting the acquisition of technology was typical in any of the NICs. In these countries, technology and capital goods came from industrialized countries and, in many cases, firms faced the lack of competence to employ them. Public resources and the concession of subsidies represented a way to reduce the cost of using advanced technology and eventually promoted its acquisition (Khan and Blankenburg, 2009). Nevertheless, despite several countries experienced the use of government's subsidies to private companies in order to upgrade technology and industrial capacities, only few of them were able to get effective results avoiding dramatic waste of public money and government failures. In South Korea, one of the elements deemed necessary for a virtuous relationship between government and private companies was a mechanism of reciprocity (Di Maio, 2009). This mechanism consisted in an exchange between public institutions and companies whereby public institutions gave the subsidies while the companies had to report periodically their economic performance. This disclosure was necessary to verify the achievement of the arranged targets; if that was not the case, the transfer of public resource had to be suspended. In general, the amount of exports, the number of foreign markets served, the share of local content in goods produced are examples of standards used in this mechanism. This mechanism structured the government–industry relationship in a way to avoid potential establishment of permanent rent positions for private companies (which is one of the most common source of government failures).

	1950	1960	1970	1980	1990	2009
<i>Light industries</i>	78.9	76.6	56.5	38.7	26.7	13.8
Food, beverage and tobacco	–	–	19.6	10.8	7.2	5.1
Textile, leather	–	–	28.0	23.3	13.3	4.1
Other (paper, wood)	–	–	8.9	4.6	6.2	4.6
<i>Heavy industries</i>	21.1	23.4	39.8	58.4	70.0	84.9
Machinery	–	–	8.1	16.6	23.5	33.9
Transport equipment	–	–	8.5	5.2	11.7	17.5
Chemicals and plastics	–	–	14.2	19.9	14.4	25.5
Other (metal, mineral)	–	–	9.0	16.7	20.4	18.0
Manufacturing n.e.c.	–	–	3.7	2.9	3.3	1.3

Source: Authors' elaboration on data from Bank of Korea (2015) and OECD (2014)

Table I.
Manufacturing value
added (share on
total manufacture,
selected years)

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Moreover, along with measures for import substitution with domestic goods, during these years South Korean industrialization was sustained by various measures aimed at promoting exports. On the one hand, good export performance of the country was due to the external context that was favorable to Korea's export ambition: transport costs were decreasing, as well as tariff barriers in advanced economies. In addition, the increase of skilled labor force in developed countries made Korean labor-intensive goods attractive in international trade flows (Wade, 1992). On the other hand, some authors underline that government's policies had a role during this period. In particular, they refer to the provision of adequate infrastructure, the maintenance of macroeconomic stability and the promotion of investments in physical and human capital (Krueger, 1990, p. 110; World Bank, 1993, p. 312). Lee *et al.* (2010) state that the government actively influenced the outward-looking development strategy also through credit guarantees and tax benefits for exporters. In this context, Korean Trade Promotion Agency was created with the aim to support and sustain exports.

Foreign trade gradually became one of the main sources of economic development in South Korea. Lee *et al.* (2010) show that in 20 years from 1950s to the early 1970s, the amount of Korean exports grew by a factor of 20. The kind of exported goods also changed from agricultural commodities and raw materials to labor-intensive goods (see Table II).

The Economic Planning Board (EPB) played a leading role throughout the first decades of industrial development of South Korea. It was a state agency under the coordination of the Ministry of Strategy and Finance (MOSF), with tasks such as the planning of industrial strategy, the preparation of governmental budget, the allocation of public resources to the investment projects, the collection of data and statistics, the coordination and evaluation of policies. Kim and Leipziger (1993) and Chang (1994) described it as a "super-ministry." In addition, the relevance of this body is testified by the fact that the head of the EPB was deputy prime minister *de jure*.

In the 1970s, upgrading the industrial structure became the primary goal of the government. The South Korea "big push" of those years was characterized by a fast growth of heavy and high-value-added industries, such as chemicals, steel and basic metal industries, shipbuilding, manufacture of machinery and electrical equipment (Lim, 2012). In these sectors government's investments were performed in order to renovate industrial plants, sustain total exports and reach economies of scale. During this decade, heavy industries overcame light ones in terms of value added (see Table I).

Several measures implemented by the government and the EPB were aimed to foster the shift from light sectors to heavy and chemical industries. They ranged from the concession of low-cost credit and tax incentives to firms operating in target sectors, the direct participation of the National Investment Fund in risky projects, the protection against

Table II.
Exported goods
(share on total
exports, selected
years, SITC Rev. 1)

	1962	1970	1975	1980	1985	1990	1995	2000	2005	2013
Food and live animals	38.6	7.8	11.9	6.6	3.7	3.1	2.2	1.4	0.9	0.9
Beverages and tobacco	0.2	1.7	1.3	0.7	0.3	0.2	0.1	0.1	0.2	0.2
Crude materials. inedible, except fuels	37.6	12.0	3.0	1.9	1.0	1.4	1.5	1.1	1.0	1.2
Mineral fuels, lubricants	4.9	1.0	2.1	0.2	3.1	2.1	2.0	5.5	6.3	9.5
Animals and vegetable oils and fats	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Chemicals	1.7	1.4	1.5	4.5	3.3	4.5	7.3	8.1	9.8	11.8
Manufact. goods classified by material	10.9	26.4	29.2	35.7	23.3	22.7	22.6	17.9	14.5	12.9
Machinery and transport equip.	2.6	7.4	13.8	19.7	36.4	39.4	51.5	57.0	58.7	54.7
Miscellaneous man. articles	3.4	42.2	37.1	30.3	28.8	26.8	12.8	9.0	8.6	8.6
Commod. and transacts. Other not class.	0.0	0.0	0.2	0.4	0.1	0.1	0.0	0.0	0.0	0.1

Source: Authors' elaboration on data from UN Comtrade

competitive imports in certain goods, the erection of entry barriers in specific markets (see Amsden, 1989; Rodrik, 1995, for details). In this process, foreign direct investments (FDIs) remained irrelevant since the governments tried to keep the economic system as independent as possible from foreign hands. When foreign investments were involved in national industrial programs, the government imposed that technology transfer took place through the purchase of ready-to-use plants or through agreements for which foreign customers provided everything needed to start production, from design to projects and quality control systems. In the heavy industries the most common tools for technology transfer were the acquisition of foreign patents, reverse engineering and the importation of machinery and plants with related technical assistance, in particular from Japan (Amsden, 1989; Suh and Chen, 2007).

Government intervention during this decade was strongly selective targeting the industries and companies deemed as strategic. For example, subsidized credit was disbursed on a discretionary basis, by granting long-term loans exclusively to companies operating in industrial sectors defined by the government as priorities (Amsden, 1989; Rodrik, 1995). Through this mechanism, the government favored companies such as Ssangyong in the cement sector, POSCO (already publicly owned) in the steel industry, Hyundai in shipbuilding, Hyundai, Samsung and Daewoo in construction.

At the end of Park's era and after 20 years of public policies, the Korean economy had changed profoundly: agriculture became less and less important whereas the manufacture generated the vast majority of the wealth (Table III).

3.2 *The industrial policies in the 1980s*

The situation described so far underwent huge transformations in the 1980s. Park's death in 1979 paved the way for the transition to a fully democratic form of government. In the economy, the competition coming from China and other Southeast Asian economies was stronger and stronger in particular in steel industry, shipbuilding and car industry, as those countries benefited from lower costs of labor (Cumings, 1984).

The new government led by Chun Doo Hwan attempted to reduce the macroeconomic instability and to internationalize Korean enterprises with the 1982 Comprehensive Economic Stabilization Program. Moreover, as it was happening in the major industrialized economies, the South Korean economy started to be more open to international flows through participation to GATT and Uruguay Round (Lee *et al.*, 2010). Tariff and non-tariff barriers to trade started to decrease and constraints to FDIs were removed. The Fair Trade Commission was created in 1980 with the aim to manage the liberalization processes and

Year	Agriculture	Mining and quarrying	Manufacturing	Energy and construction	Services
1953	47.3	1.1	9.0	2.6	40.0
1960	36.8	2.1	13.8	4.1	43.2
1965	38.0	2.0	18.0	4.8	37.2
1970	26.9	1.5	20.9	7.1	43.6
1975	26.9	1.5	22.2	5.7	43.7
1980	16.0	1.4	24.6	10.0	48.0
1985	13.3	1.3	26.7	9.7	49.0
1990	8.7	0.8	26.6	12.4	51.5
1995	6.2	0.5	26.7	12.0	54.6
2000	4.6	0.3	28.3	9.5	57.3
2005	3.3	0.3	27.5	9.9	59.0
2012	2.6	0.2	31.1	7.9	58.2

Source: Authors' elaboration on data from Bank of Korea (2015)

Table III.
Value added for
economic activity
(share on total GDP,
selected years)

competition (Lim, 2012). The public strategy for science and technology (S&T) also changed. Up until then, the technological progress simply came from the acquisition of foreign technology. With the 1982 National R&D Program, public policies were focused on the development of domestic technologies. Through this program the government, supported by universities and private companies, targeted the research projects to be promoted were selected. R&D activity was largely supported through private investments. Private companies, especially the larger ones, had adequate financial resources to undertake even risky research projects and had a well-educated workforce suitable for research activities. The R&D department was gradually becoming one of the most important for economic performance of private companies, which could no longer exploit the cost advantages in order to compete on international markets. In this framework involvement of private actors and university in targeting S&T projects allowed the government to get access to information extremely relevant for the decision-making processes related to industrial policy. Indeed, as argued by the literature on the topic (see, e.g. Hausmann and Rodrik, 2002), a systemic approach to industrial policy, involving all the relevant actors, appeared as way to bridge the informative gap between government and targets of intervention, mitigating possible government failures.

Apparently, during the 1980s South Korea experienced a discontinuity in the industrial strategy of the government, probably also in light of a new international context, where Washington Consensus was suggesting a drastic reduction of the public role in economic dynamics. In this context some observers argued that industrial policies implemented in the 1960s and 1970s were the cause of important problems of overcapacity in Korean heavy industries, which led to strong macroeconomic imbalances in 1980s (Park, 2005). Accordingly, during this period the emphasis shifted from growth-first policies to the consolidation of growth with stability and from a government-led economy to a private-led one (Koh, 2010).

However, according to some others (see, e.g. Lim, 2012) this shift was more formal than substantial and the state kept an important power in the economy. Indeed, during the 1980s the government approved some other selective industrial policies, such as anti-competitive measures aiming at rationalizing and restructuring the industrial sectors that were suffering from overcapacity (i.e. energy sectors, automotive and machinery industry). Along with the introduction of tax benefits for companies operating in these sectors, the government supported the erection of barriers to entry in specific markets and imposed some mergers and acquisitions. This ultimately generated an increase in market concentration and size of industrial groups (the so-called *chaebol*), which *de facto* were the only entities with the necessary resources to acquire businesses in crisis. The reorganization was generally conducted according to the principle that there would be a *chaebol* for each industrial sector (Cumings, 1984). These measures were extended to many more sectors in the second half of the decade, with relevant impact on the ability of South Korea to compete in international markets.

As a conclusion, the “big push” of the 1960s and 1970s, where the government had assumed a sharp interventionist role in the economy, had led in the 1980s to completely different industrial structure and ability to compete in international markets. The upgrade of the Korean economy was *per se* enough to justify a change in industrial approach that start to rely more on market dynamics, but with modalities that allowed the government to keep control on competition through R&D policies and markets concentration.

3.3 The period until the 2008 crisis

Liberalization trends continued during Roh Tae-woo and Kim Young-sam’s administrations, in office during the 1990s. The government approved the measures contained in the 1993 Five-Year Plan as agreement with the private sector, after a bottom-up decision-making process. The plan indicated the will of the public entity to reduce its direct presence in the

economy and to favor private economic initiative. Furthermore, the EPB was suppressed and its tasks were transferred to the new MOSF in 1994.

The financial crisis that burst in 1997 in Southeast Asia contributed to further change the role of the state in the economy. Important interventions in this period refer to rescue packages approved in favor of the financial sector, consisting in bailing out the two largest banks of the country, tightening the regulation for financial institutions and creating the Financial Supervisory Commission (Suh and Chen, 2007; Koh, 2010). Moreover, to obtain from IMF the necessary loan to cope with the crisis, South Korea accepted to implement IMF's structural adjustment programs, which demanded public interventions for macroeconomic stability, rigorous monetary policies, markets liberalization, privatization of public companies and fiscal austerity (Koh, 2010).

Nevertheless, although apparently the government was shrinking its role in the South Korean economy during these years, at the end of the 1990s emerged clearly a new important public function related to foster technological innovation. In 1999 the Korea Knowledge-Based Economy Master Plan opened a new phase in government's innovation-oriented measures. Suh and Chen (2007) assert that the main goal of the government was to strengthen the innovative and research capacities, in particular in ICTs. High investments in physical infrastructure and actions to promote competition were implemented in ICTs and related sectors. These investments were also a way to respond to the 1997 crisis that had generated rising unemployment and decreasing GDP.

In 1999 the country recovered from the crisis and started to grow again (see Table IV). In this context, South Korean exports in international markets acquired new vigor, within an institutional framework where the establishment of trade agreements with foreign economies was one of the government's priorities. During the 2000s, numerous bilateral agreements were signed with several important trade partners, including the USA and European Union (MOTIE, 2014a). The positive economic framework of early 2000s continued until the 2007 global financial crisis.

At the beginning of 2008 the rise in prices of oil and raw materials was worsening the Korean balance of payment. When 2007 financial crisis impacted the global economy the situation got further worse. The fall in global demand hit Korean exports and the GDP fell by 3.3 percent in the last quarter of 2008 (Moon, 2009). Nevertheless, recovery from the 2008 crisis was as fast as in 1997. Lee Myung-bak's government implemented expansionary monetary and fiscal policies to cope with the crisis. Following the depreciation of the won and the renewed stability of raw material prices, Korean exports were re-launched and, in 2010, the annual growth rate returned at 6.5 percent (Moon, 2010).

4. The Korean economy today: the "creative economy" strategy

With the government in office at the end of 2012, led by Park Geun-hye, daughter of General Park, there seems to have a new change of perspective in politics for industrial development

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	1996	1997	1998	1999	2000	2004
GDP per capita (\$)	12,197	11,176	7,355	9,438	10,841	15,898
GDP real growth (%)	7.2	5.8	-5.7	10.7	8.8	4.9
Net exports (\$)	-16.7	-6.2	39.5	25.3	15.6	39.3
Exports	124.4	132.4	127.5	136.0	169.5	256.0
Imports	141.1	138.6	88.0	110.8	153.9	216.8
Gross investment ratio (%)	38.1	35.6	25.2	29.1	30.7	32.3
Gross saving ratio (%)	34.8	34.6	36.6	34.6	33.0	35.5
Unemployment rate (%)	—	2.6	7.0	6.3	4.1	3.5

Source: Adapted from Bank of Korea (2014)

Table IV.
Main economic
indicators (1996–2004,
selected years)

in South Korea. With the liberalizations of the 1980s and 1990s, the Korean Government had certainly moved to some extent toward reducing its role in influencing the direction of economic development. In the aftermath of the global financial crisis, however, government programs seem to openly reveal the return to a strategic role of public administration in industrial dynamics.

In this context, the Three-Year Plan for Economic Innovation (2014–2017) has been one of the most relevant action promoted by the government (MOSF, 2014a). On the one hand, the interventions included in the plan are of “horizontal” nature, aiming to foster efficiency and effectiveness of public administration and regulate the labor market and the welfare system. On the other hand, the Plan draws a specific trajectory for the future development of the Korean economy, focusing on innovation and the promotion of a “creative economy” (Howkins, 2001; Tassinari *et al.*, 2015). As described in the MOSF (2013), the main goal is to make South Korea an economy in which “creativity and imagination will be combined with science, technology and ICT to create new industries and markets, and to make existing industries stronger and thus create good jobs.” Specifically, the reference to “good jobs” appears to be connected to the social concerns about skill mismatch and over-education, emerged in recent years. Indeed, latest statistics show a relevant share of workers with high educational levels (58 percent in 2016 of the workforce) coupled with rising youth unemployment rates (constantly increasing in 2012–2016 period) (Lee, 2017; Lee *et al.*, 2018).

Following this general goal, the Plan identifies six main strategic lines of intervention (see Table V).

In this context, one of the most important aspects of the plan is the relevance conferred to small and medium enterprises (SMEs) and to venture capital. Indeed, a well-known characteristic of the Korean industrial structure is that it is dominated by the so-called *chaebols* (namely huge corporations), which are often under the control of a single family that operates in several diversified sectors. However, the Korean economy is also characterized by a huge number of small or medium enterprises that coexist with these concentrations of economic power. In this scenario tackling SME’s problems could be essential to reach key industrial objectives. Specifically, the most critical issues affecting the SMEs are, on the one hand, the hard competition suffered from Asian manufactures (and in particular from the Chinese one) and, on the other hand, the dependence on supply contracts with larger companies (Eichengreen *et al.*, 2015). This latter point directly refers to the need for a better “economic democracy.” With this expression, the government supports the idea that a higher level of equality within the Korean industrial system and a greater cooperation between SMEs and *chaebols* are fundamental for future economic development and in particular for bridging the gap existing in economic performance between SMEs and large enterprises (see Table V, number 2). For instance, productivity of the small firms is only the 28 percent of big firms’ productivity (OECD, 2014).

In this framework, the upgrading process of SMEs is foster by the government through the promotion of innovation and creativity. The development of creative capacities is specifically targeted by the government as a driver of rising economic performances in manufacturing industries characterized by products with high level of creativity. In this perspective public support aims at removing financial constraints to technological development by granting public funding and state guarantees on private loans (Doh and Kim, 2014).

Along with general measures supporting SMEs, government attention is focused on specific industries deemed of strategic relevance for the South Korean economy. Shipbuilding, machinery manufacturing, chemicals and automotive industry are the traditional sectors monitored by the government as a fundamental part of the national industrial system (Lee *et al.*, 2013). However, several advanced industries are increasing enormously their relevance and are object of particular attention from the government.

Targeted industrial policy and government failures

Creative economy action plan and measure to establish a creative economic ecosystem	
<i>(1) Compensate creativity and create an ecosystem that promotes the creation of startups</i>	
Venture capital and startups	Institutionalization of crowd funding; creation of the Future Creation Fund (500bn won)
Patents	Country Patent Strategy Blueprint: ease and promote the patenting of creative ideas; incentivize companies that introduce inventions of their employees
<i>(2) Strengthen the role of SMEs and startups and facilitating the access in foreign markets</i>	
New products	Support through public procurement system
Investments in ventures and SMEs	Measure for a Venture-Startup Funding Ecosystem: financial support and promotion for mergers and acquisitions and for listing in stock markets for innovative SMEs
Startups: accessing foreign markets	Support for internationalization from public consulting centers in Korea and foreign countries (Global Startup Support Center)
Cooperation between small, medium and large enterprises	Promote cooperation projects and outcome sharing systems between SMEs and <i>chaebol</i>
Training and human resource shortages	Cooperation between SMEs, local governments and training centers to improve the matching between human resource demand and supply
<i>(3) Promote new markets and new industries</i>	
Competitiveness and productivity in existing sectors	Promote the introduction of IT management systems and the development of green innovations. Public investments in transport infrastructures (LTE network, smart driving)
Software industry	Improve software education and internet security. Development of cloud computing and of Big Data analysis. Creation of Korea Digital Contents Fund (400bn won) digital contents industry (music, games, movies)
Biomedical, nano-technology, green industries	Support for the development of strategic industries through public funds
<i>(4) Foster global creative talent</i>	
Education system	Improve school and university systems to eliminate unnecessary specializations. After-school projects can help spreading entrepreneurial culture (technology startup camp and one-to-one mentoring)
Domestic inflow of creative talent	Creation of a "Startup Visa" for foreign young entrepreneurs who start new businesses in Korea
<i>(5) Strengthen the innovation capacity of science, technology and ICTs</i>	
Research activity and commercialization of research outcomes	40 percent increase in public funds for basic research; support for young people with creative ideas
Innovation capacity and ICTs	Investments in new generation communication technologies (5G, next-generation Wi-Fi, realistic media)
Regional innovation of universities	Creation of regional organizations for technology planning and management
<i>(6) Create a creative economic culture</i>	
Creative culture	Encourage the development of new ideas; creation of "Creative Korea" online portal with information about creative economy strategy
Fusing creative ideas with public resources	Open access of government data for private citizens (Public Information Supply and Use Stimulation Act)
Innovating government working methods	New communication methods between administrative agencies to improve cooperation; use of comprehensive analyses of Big Data for policy decisions
Notes: Strategies are in numbered rows; for each strategy, tasks are in the left column, action plans in the right column	
Source: Authors' elaboration from MOSF (2013)	

Table V.
Strategies and tasks
in the Three-Year
Plan for economic
innovation

In this context ICTs and related industries (such as the production of office equipment, semiconductors and communication devices, except the software industry) have shown very high performance in recent years (Eichengreen *et al.*, 2015). Moreover, specific support is given to 13 new key sectors, among which nanotechnologies, biotechnologies, robotics, bio-artificial devices, autonomous vehicles and green industries (MOTIE, 2014b).

In this context green economy occupies certainly a special place in government plans. The National Strategy for Green Growth 2009–2050 and the 2009 Five-Year Plan for Green Growth prove the efforts of the country in this direction. Large amounts of resources (108bn allocated in five years) have been made available for green projects, like R&D for eco-innovations and the renovation of old polluting plants (Jones and Yoo, 2011).

Along with manufacturing, the phenomenon of the tertiarization of the economy is more and more evident in South Korea. In 2005, the 59 percent of the Korean value added was created in service sectors (see Table I), although the level of productivity of these sectors remains below the level reached in manufacture (OECD, 2014). The government is pushing forward the so-called knowledge-based services in order to promote a more balanced and sustained growth of the whole economy and increase productivity in the tertiary sector (Lee, 2016). Specifically, the Three-Year Plan for Economic Innovation (2014–2017) has identified health care, finance and logistics as three key areas to focus on (MOSF, 2014b). In this context particularly important are medical assistance and personal services, given the rapid aging of Korean population. Although Korean health system is generally considered to be of good quality (Eichengreen *et al.*, 2015), the challenge in this area is to succeed in attracting more patients and investors from abroad and further increase the sector performance. Among the measures implemented to this goal, there is for instance the possibility for high-quality and specialized foreign hospitals to open branches in Korean Free Economic Zones (MOSF, 2014b). In this framework, the Jeju Free International City Development Center is a project to make the island of Jeju, in the south of the peninsula, the reference medical center for East Asia (Goldstein, 2013, p. 67).

5. A picture of South Korean structural change

5.1 Data and methodology

After the historical overview of South Korean industrial policy, this section aims at empirically analyzing the structural adjustment of the country. The idea is not to assert a direct causal relation between policy actions and structural development of the economy. As we discussed in the beginning of the paper (and as we will focus again on this topic in final remarks), there are many factors that have pushed Korean industrial development and government intervention is just one element of the framework acting in complementarity with others. Thus, this section wants to capture how the Korean system, as a whole, historically performed regarding industrial change.

To this goal, methodologically we build a composite indicator – the Economic Performance Index (EPI) – which ranks the South Korean manufacturing sectors according to their economic performance (Di Tommaso *et al.*, 2017; Barbieri *et al.*, 2015). Sectoral performance is synthesized in a composite indicator by considering five variables describing the main economic record achieved by the different industries:

- (1) value added;
- (2) employment;
- (3) gross fixed capital formation;
- (4) labor productivity; and
- (5) exports.

As for the methodology used for the construction of the indicator, we refer to the handbook of the OECD (2008). In particular, since we have variables with different measurement units, the first step requires the normalization of the dataset, to make them comparable. The method used is the min–max (OECD, 2008, p. 85) that is useful to give common benchmarks of economic performances internally the Korean economy:

$$z_{s,t} = \frac{x_{s,t} - \min_t \{x_s\} + 1/n}{\max_t \{x_s\} - \min_t \{x_s\} + 2/n},$$

where $x_{s,t}$ is the value of the variable x for the sector s at time t , $\max_t \{x_s\}$ e $\min_t \{x_s\}$ are, respectively, the maximum and the minimum value of the same variable and n is the total number of sectors. After the normalization step, all the variables present data included in the range (0; 1). We obtain in this way one matrix of variables per year. In the aggregation step of the analysis, where the different variables are synthesized in a single value, we use the Fisher combining function, which statistically assigns high performance to those sectors that achieve high performance in one or more variables (this is useful to emphasize on the analysis of the role of sectors with very high performances). The formula of the EPI is specified as follows:

$$EPI_{s,t} = - \sum_{i=1}^5 w_i \cdot \log(1 - z_{s,t}),$$

where $EPI_{s,t}$ is the value of the EPI for the sector s at time t . We choose to assign the same weight w_i to each variable i ; since we have five variables, w_i in the last equation is equal to 0.2.

The last step is the normalization of the EPI, using the min–max method:

$$EPI_{s,t}^{norm} = \frac{SSI_{s,t} - \min_t \{SSI_s\}}{\max_t \{SSI_s\} - \min_t \{SSI_s\}}.$$

The higher the EPI, the higher the sectors' economic performance.

We elaborate data from UNIDO's database and, for export data, from UN Comtrade's database, both classified by the International Standard Industrial Classification (ISIC Rev. 3). We compile annual rankings of sectors on the basis of their economic performance. This exercise is performed twice. For the first application we use data for 15 industrial sectors defined at two-digit level of detail, for the period 1963–2012. In the second application we collect more detailed data (at three-digit level of detail) and obtain rankings of 56 sectors for 2011 and 2012.

5.2 Results

The figures show the position in ranking of selected sectors: Figure 1 refers to three labor-intensive (or light) sectors, while Figure 2 refers to three capital-intensive (or heavy) sectors. Starting with the light industries, the loss of strategic value over time is evident for the industries of food and tobacco (ISIC 15–16), for the textile sector (ISIC 17) and for the manufacturing of wearing apparel and leather products (ISIC 18–19). All these sectors are high in the rankings between the 1960s and 1970s, as shown in Figure 1. The decline starts in 1980s for food industry and textile and only in the 1990s for the production of wearing apparel, thanks to excellent performance in terms of exports.

Figure 2 shows the performance of heavy industries, with a specular pattern compared to the light ones. Despite some fluctuations in the trend, the constant rise of capital-intensive sectors is clear from the 1970s, especially for the manufacturing of petroleum products

Figure 1.
Positions in ranking
of selected light
sectors (1963–2012)

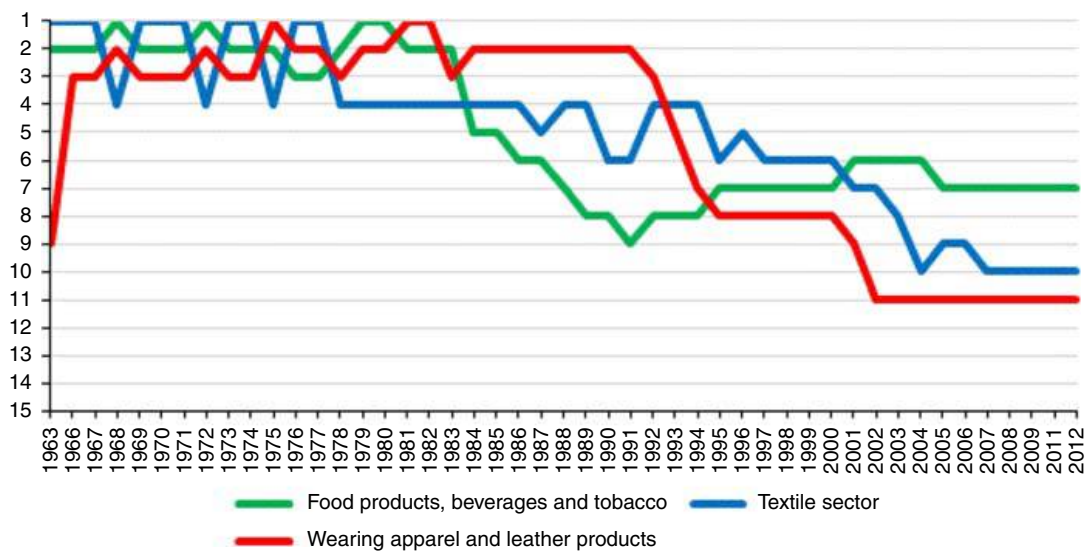
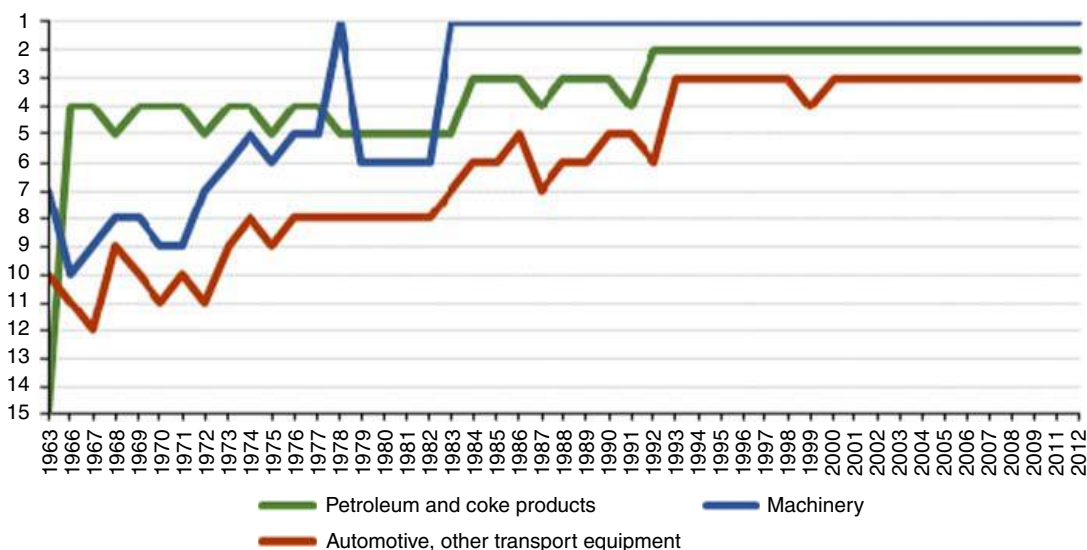


Figure 2.
Positions in ranking
of selected heavy
sectors (1963–2012)



(ISIC 23), for the machinery industry (ISIC 30–33) and for the automotive industry (ISIC 34–35). At the end of our time series, in 2012 these three industries occupy the first three positions in the ranking (Figure 2).

To sum up, the results of this first application show a gradual rise of capital-intensive industries over time and, at the opposite, the continuous loss of economic performance for labor-intensive industries. In general, we can state that this is consistent with the trends highlighted in the historical analysis, namely the initial prevalence of light industries and then the emergence of heavy and chemical ones in the Korean industrial structure.

With the second application, we look at the rankings in more detail. Our purpose now is to identify economic performance of sub-sectors. Table VI exhibits the final results in terms of the first ten and the last three positions in 2011 and 2012. The results show that the rankings relative to the two years are very similar. Consistent with historical trends, at the first places of the rankings we find some sub-sectors related to chemical industries. For instance, biotechnology, which has been recently targeted by the Korean Government as

Pos. 2011		2012	Targeted industrial policy and government failures
1	242 Manufacture of other chemical products	232 Manufacture of refined petroleum products	
2	351 Building and repairing of ships and boats	242 Manufacture of other chemical products	
3	232 Manufacture of refined petroleum products	271 Manufacture of basic iron and steel	
4	361 Manufacture of furniture	361 Manufacture of furniture	
5	271 Manufacture of basic iron and steel	341 Manufacture of motor vehicles	
6	341 Manufacture of motor vehicles	241 Manufacture of basic chemicals	
7	241 Manufacture of basic chemicals	319 Manufacture of other electrical equipment n.e.c.	
8	319 Manufacture of other electrical equipment n.e.c.	321 Manufacture of electronic valves and tubes and other electronic components	
9	321 Manufacture of electronic valves and tubes and other electronic components	323 Manufacture of television and radio receivers, sound or video recording or reproducing apparatus	
10	323 Manufacture of television and radio receivers, sound or video recording or reproducing apparatus	289 Manufacture of other fabricated metal products; metal working service activities	
...	
54	182 Dressing and dyeing of fur; manufacture of articles of fur	221 Publishing	
55	201 Sawmilling and planning of wood	333 Manufacture of watches and clocks	
56	231 Manufacture of coke oven products	231 Manufacture of coke oven products	

Table VI.
Results of the
second application
(56 sub-sectors, ISIC
3-digit, 2011 and 2012)

one of the key sectors for future economic development, is included in manufacture of basic chemicals. Very high economic performance is also shown by other key industries, such as motor vehicles, electrical equipment and shipbuilding. Specifically, the sub-sectors related to the manufacture of electronic components, general and special machinery and office equipment occupy positions between the 8th and the 19th. Regarding sub-sectors important for environmental issues, the results indicate good performance for automotive (5th position) and manufacture of electric motors and generators (13th), but lower performance is shown by processing of nuclear fuel (22nd) and manufacture of batteries and electric accumulators (39th). Finally, despite “health industry” has more recently attracted considerable attention in the Korean economic development, medical instruments and appliances have reached a quite low performance (32nd position in the ranking). Generally this more detailed analysis shows a rather heterogeneous picture of the Korean economy, where the government is targeting (according to the recent Plans) both industries with very high performances and sectors with low economic records (but endowed with high potential in terms of meta-economic value, including health security and environmental quality).

6. Concluding remarks: government failures in a systemic view

This paper has considered South Korean historical structural change, from a historical and empirical point of view, as a peculiar case to analyze the role of government in economic development. Starting with a rather interventionist and selective approach during the 1960s and 1970s, economic policies changed during the 1980s and 1990s fostering markets liberalization, privatizations and a less intrusive role of the government in the economy. Observing this historical trend, many interpretations have been proposed in literature about the drivers of South Korea’s industrialization and it is clear that still there is no unanimity about the factors that have contributed to the economic development of the country. Some views attribute to the market a prominent role in industrialization process, while others recognize in a “developmental state” the source of South Korean economic progress. At a general level this dispute can be referred to a more broad and ancient debate “State vs Market,” as competing ways to promote economic development. Following this line of reasoning, prevailing in academic literature, the fundamental question that leads the debate is: did the Korean economy develop thanks or despite government intervention?

Even though this question could sound as a pragmatic and effective way to frame research lines interested in finding effective models to promote industrial development, the analysis conducted in the previous pages on the Korean case seems to suggest a different view. Indeed, a dichotomous manner to interpret economic dynamics appears to be rather misleading. Views in favor of the market and those in favor of an interventionist role of the government, both tend to neglect that economic development could be to a large extent interpreted as a systemic process, which is the result of historical interactions between many factors and actors, including government, markets and civil society. In this perspective all the actors involved in the development process interact by enforcing (converging or competing) interests, creating a balance of forces founding a particular approach to economic and industrial development. In this systemic framework, markets and government seem to interact by influencing each other, creating complementarities and sometime synergies, so that it is rather difficult to assign a prevailing role to a particular factor of development (e.g. to imagine well-performing markets without a good-supervising government). Thus, the way for development has to be sought in virtuous relationships between different actors and historical circumstances, which lead the trajectory of the system as a whole. This seems to be the “secret recipe” of South Korean industrial development.

In South Korea, industry–government relationship and the role played by public administration in governing the markets are historically evolved under the pressures of different interest groups, changes in national economic structure, economic crisis, international constraints and so forth. In this framework, the case for a possible government’s ability to respond effectively and efficiently to the general interest of the society (by mitigating government failures) has to be searched in the peculiar mechanisms founding the relationship between government, industry and civil society. Specifically, some important features of this relationship deserve to be briefly recalled.

First, the Korean experience reveals how important was to have a rather homogeneous pool of interests in the society. The equal distribution of land and wealth at the beginning of the industrialization process was essential to define a collective interest around the goals of industrialization and economic growth and to share benefits of development. In particular it was the civil society and a student revolution to create the popular pressures that constrained the new government to create institutions and strategies for economic development. In this context the general level of education of the population (Rodrik, 1995; Booth, 1999), since the Japanese domination was creating people ready to actively participate to the economic and political life of the country, binding in a fundamental way industrial processes and government’s actions to the supervision of civil society.

Second, concerning the mechanisms of policy implementation, public investments in strategic industries were not provided in an “aseptic” contest, regardless the historical circumstances and of different interests at stake. On the contrary, industrial policy was implemented in a peculiar (formal and informal) institutional framework involving the relationship between public bureaucracy and private sector. Indeed, South Korea has been characterized by a reciprocal control mechanism that has worked through the concession of different incentives to the private sector on the bases of the achievement of certain performance defined by the government (Amsden, 2001). The presence of this reciprocal control mechanism was an essential element to control for the effectiveness of the industrial policies, mitigating potential sources of government failures. Indeed, what is typical of this mechanism is that it works only if the bureaucracy is independent enough to resist external pressures. In this context, the rent-seekers (i.e. private subjects that try to influence decision-making processes) cannot succeed in distorting public actions toward particular interest. In the Korean industrialization, few powerful *chaebols* were not interested in participating in rent contests and there were no other interest groups with sufficient power

to influence governmental decisions (Chang, 1994). Moreover, concerning cultural characteristics, Confucianism promoted meritocracy, morality and honesty, in particular, for employing in public offices (Bertoldi, 1996), since they perceived their role as directly involving in the collective well-being. All these aspects contributed to the strength of the Korean Government, described as a “Bureaucratic-Authoritarian Industrializing Regime [...] ubiquitous in economy and society: penetrating, comprehensive, highly articulated, and relatively autonomous of particular groups and classes” (Cumings, 1984, p. 28).

To note that a systemic approach to industrial policy, involving all the relevant actors of the system, continued also after the 1980s, when apparently South Korea experienced a shift in industrial strategy, with a reduction of the public role in economic dynamics in favor of freer markets. Indeed, markets liberalization occurred through a bottom-up decision-making process, where industries were “ready” for a more competitive context and granted their consent to the government. This strict relationship between government and national industry could further contribute to mitigate government failures by helping to bridge the informative gap between government and targets of intervention.

Third, all the domestic conditions mentioned above intertwined with an international context particularly favorable to South Korean economic growth. Indeed, good export performances were essential to Korean industrialization and these were facilitated by a reduction in barriers to trade in advanced economies and decreasing international transport costs.

To conclude, there was not one single element at the base of Korean industrialization, as instead academic literature often tends to emphasize. Rather, peculiar systemic conditions have to be considered. Elements of success are not merely related to political techniques or economic prescriptions, but they are related to the structure of the society as a whole and the interests it express in different historical stages. This could explain why South Korean model of development is not easy to replicate successfully. From this point of view, the study of the Korean experience can be useful, not because it is a model to reproduce everywhere, but because it is a valid source of suggestions on the crucial elements on which the debate on how to mitigate government failures could be re-open in the name of the public interest.

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