



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

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

### ABSTRACT

#### **Purpose**

This paper reflects on the efficiency and effectiveness of industrial policies by focusing on the peculiar experience of South Korea. It analyses Korean structural change from an 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.

#### **Methodology**

The paper adopts an 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 rules the relevant relationships within the system.

#### **Originality**

In the post crisis debate, very few attention has been devoted in academic and political debate to the ways to mitigate *government failures*. By analysing the historical and recent Korean experience with industrial policy, the paper addresses an issue insufficiently analysed offering an innovative contribute.

**Keywords:** Industrial development, Industrial policy, Composite indicator, South Korea

*JEL classifications:* L50, L60, O14, M00

## 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). In this context, however, very few attention has been devoted to new ways to mitigate severe *government failures*.

The *government failures*' literature, emerged during the last forty 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 whilst its supporting theory appears often inadequate to explain how, why and when such intervention could be desirable or not. Very few 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

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4 industrial policy, identifying specific elements and conditions that can contribute to  
5 mitigate government failures and to improve the effectiveness of the public action.  
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7 The paper is structured as follows. The next section outlines the main theories on  
8 South Korean industrial development. The neoclassical view, the developmental state  
9 approach and the culturalist view are considered as the main competing theories. Section 3  
10 provides an historical overview of the Korean industrialization, from the period of the  
11 dictatorship that ruled the country in 1960s and 1970s up to the Crisis of 2008. Section 4  
12 analyses the recent industrial strategy and the new paradigm of the *Creative Economy*,  
13 which is generally defined as an economic system based on creative products, where  
14 people's creativity is the main source of economic value (Howkins, 2001). Section 5 aims  
15 at assessing empirically the process of South Korea's structural change. It presents the  
16 construction of a composite indicator, in order to empirically analyze the industrial  
17 evolution of the Korean economy over time. Section 6 provides concluding remarks  
18 focusing on the possible sources of success and failures of government action in South  
19 Korean industrial development.  
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## 22 **2. Competing theories on South Korean industrialization: an overview**

  
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25 The South Korean economic development has been interpreted in various ways in academic  
26 literature. This section aims to briefly present the main theories explaining the factors that  
27 have contributed to the economic development of the country. In particular, we highlight  
28 the essential features of three interpretations: the neoclassical approach, the developmental  
29 state approach and the culturalist approach.  
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31 The *neoclassical approach* focuses on the functioning of market mechanism and  
32 argues that the Korean development might be explained using the traditional catch-up  
33 theory. According to this approach, Korea's development experience is essentially based on  
34 the mobilization of inputs and trade liberalizations, which generate an increase in exports  
35 and investments. In this framework, Krugman (1994) and Young (1995) use the  
36 neoclassical model of "growth accounting" to explain the sources of economic  
37 development in South Korea, Hong Kong, Singapore and Taiwan. In this model, capital  
38 stock, amount of work and technology are the determinants of growth, while the effects of  
39 government industrial policies should be substantiated by improvements in technology and  
40 efficiency, namely in increments of so-called total factor productivity (TFP). The authors  
41 come to similar conclusions: the growth of the "Asian tigers" has nothing extraordinary,  
42 given that it is largely due to a huge increase in capital and labor factors. The role of the  
43 public policy was, moreover, marginal given the low growth of TFP, indicating a modest  
44 technological progress. Young (1995) in particular argues that "neoclassical growth theory  
45 [...] can explain most of the difference between the performance of the NICs and that of  
46 other postwar economies" (Young, 1995, p. 175). In this context, in line with the  
47 neoclassical approach, the *market-friendly view* emphasizes that the reliance on exports was  
48 the key of success of South Korean industrialization, and that the economic growth got  
49 started only when Korean firms were able to compete on international markets (Balassa,  
50 1988; Krueger, 1990). According to this interpretation, the process of internationalization  
51 led to higher levels of efficiency for Korean firms and to the reallocations of productive  
52 factors in sectors characterized by comparative advantage. In this framework, the most  
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4 important assignment for the state was to remove tariffs and other constraints to trade. As  
5 for the internal affairs, the state ought to restrict its action to correcting situations of market  
6 failure. In other words, public policies were fundamental as far as they keep a good  
7 investment climate (Stiglitz, 1996). In this context, the government's role would be limited  
8 to providing adequate infrastructure, maintaining macroeconomic stability and promoting  
9 investment in physical and human capital. Other measures to promote specific industrial  
10 sectors, such as support for heavy industries in Korea, would have been ineffective both  
11 from the point of view of the evolution of the industrial structure and from the point of  
12 view of technical progress (Krueger, 1990, p. 110; World Bank, 1993, p. 312). Holcombe  
13 (2013) is even clearer in his judgment on the role of the state, stating that the government  
14 incentives have not only been ineffective, but should have been avoided. This is because  
15 public resources have gone to the business realities that in the past had proven innovative  
16 and competitive but, in the long run, this type of industrial policy would hold back  
17 economic growth, preventing those who kept innovating from competing with the  
18 incumbents on equal conditions. In this sense, the merits of the *miracle* are related to the  
19 great abundance of work force and to the low level of labor costs at the beginning of the  
20 1960s. Like other developing countries, South Korea could take advantage of its low level  
21 of capital accumulation combined with the decreasing returns to scale of the capital in order  
22 to catch up rapidly on advanced economies. Evidence for this hypothesis would be the fact  
23 that the economic growth decelerated as the process of convergence went on. In this  
24 context, the role of the state, which implemented measures of import substitution and  
25 export promotion, has been totally ineffective (or even counterproductive according to  
26 some scholars).

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31 On the contrary, the *developmental state approach* emphasizes the role of industrial  
32 policies. It asserts that without government intervention it would not have been possible for  
33 Korean firms to face the competition on international markets (Chang, 1994, Di Maio,  
34 2009). The *developmental state* can be defined as a complex organization, featured by the  
35 collaboration between an expert bureaucratic apparatus and the private sector, which aims  
36 to achieve pre-established economic and social development objectives (Amsden, 2001;  
37 Doner *et al.*, 2005). In this context, public incentives and subsidies were necessary to allow  
38 firms to acquire and use advanced technologies from industrialized countries. A mechanism  
39 of *reciprocal control* between the private sector and the bureaucracy was set to give to the  
40 bureaucratic agencies control over the economic performances of firms, which in turn  
41 received subsidies of different nature (e.g. fiscal benefits, preferential loans, support by  
42 public funding programs). This kind of subsidies were granted on condition that firms  
43 managed to achieve specific prearranged standards (Amsden, 2001).

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46 Finally, some other researchers have also studied the relationship between economic  
47 development and specific characteristics of the Korean society, related to the solid  
48 Confucian tradition, high quality of education and exceptionally low levels of income and  
49 wealth inequality. Specifically, this so-called *culturalist approach* emphasizes the  
50 relevance of the Confucian doctrine in Korean economic development, which promoted  
51 meritocracy, morality, honesty and competence in the bureaucratic body and civil society,  
52 encouraging investments in education, equality and hard work in economic life as social  
53 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 20<sup>th</sup> 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 United States took control of the southern part of the country after World War II, 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, 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, 2013). 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 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 1). 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 e 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 Newly Industrializing Countries (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 Korean 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*).

#### [TABLE 1]

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 (KOTRA) was created with the aim to support and sustain exports.

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4 Foreign trade gradually became one of the main source of economic development in  
5 South Korea. Lee *et al.* (2010) show that in 20 years from 1950s to the early 1970s, the  
6 amount of Korean exports grew by a factor of 20. The kind of exported goods also changed  
7 from agricultural commodities and raw materials to labor-intensive goods (see Table 2).  
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10 [TABLE 2]  
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13 The Economic Planning Board (EPB) played a leading role throughout the first  
14 decades of industrial development of South Korea. It was a state agency under the  
15 coordination of the Ministry of Strategy and Finance (MOSF), with tasks such as the  
16 planning of industrial strategy, the preparation of governmental budget, the allocation of  
17 public resources to the investment projects, the collection of data and statistics, the  
18 coordination and evaluation of policies. Kim and Leipziger (1993) and Chang (1994)  
19 described it as a «super-Ministry». In addition, the relevance of this body is testified by the  
20 fact that the Head of the EPB was Deputy Prime Minister *de jure*.  
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23 In the 1970s, upgrading the industrial structure became the primary goal of the  
24 government. The South Korea «Big Push» of those years was characterized by a fast  
25 growth of heavy and high-value added industries, such as chemicals, steel and basic metal  
26 industries, shipbuilding, manufacture of machinery and electrical equipment (Lim, 2012).  
27 In these sectors government's investments were performed in order to renovate industrial  
28 plants, sustain total exports and reach economies of scale. During this decade, heavy  
29 industries overcame light ones in terms of value added (see Table 1).  
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31 Several measures implemented by the government and the EPB were aimed to foster  
32 the shift from light sectors to heavy and chemical industries (HCIs). They ranged from the  
33 concession of low-cost credit and tax incentives to firms operating in target sectors, the  
34 direct participation of the National Investment Fund in risky projects, the protection against  
35 competitive imports in certain goods, the erection of entry barriers in specific markets (see  
36 Amsden, 1989, and Rodrik, 1995, for details). In this process, foreign direct investments  
37 remained irrelevant since the governments tried to keep the economic system as  
38 independent as possible from foreign hands. When foreign investments were involved in  
39 national industrial programs, the government imposed that technology transfer took place  
40 through the purchase of ready-to-use plants or through agreements for which foreign  
41 customers provided everything needed to start production, from design to projects and  
42 quality control systems. In the heavy industries the most common tools for technology  
43 transfer were the acquisition of foreign patents, reverse engineering and the importation of  
44 machinery and plants with related technical assistance, in particular from Japan (Amsden,  
45 1989, Chung and Suh, 2007).  
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48 Government intervention during this decade was strongly selective targeting the  
49 industries and companies deemed as strategic. For example, subsidized credit was  
50 disbursed on a discretionary basis, by granting long-term loans exclusively to companies  
51 operating in industrial sectors defined by the government as priorities (Amsden, 1989;  
52 Rodrik, 1995). Through this mechanism, the government favored companies such  
53 Ssangyong in the cement sector, POSCO (already publicly owned) in the steel industry,  
54 Hyundai in shipbuilding, Hyundai, Samsung and Daewoo in construction.  
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4 At the end of Park's era and after twenty years of public policies, Korean economy  
5 had changed profoundly: agriculture became less and less important whereas the  
6 manufacture generated the vast majority of the wealth (Table 3).  
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9 [TABLE 3]

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12 3.2 *The industrial policies in the 1980s*  
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15 The situation described so far underwent huge transformations in the 1980s. Park's death in  
16 1979 paved the way for the transition to a fully democratic form of government. In the  
17 economy, the competition coming from China and other South-East Asian economies was  
18 stronger and stronger in particular in steel industry, shipbuilding and car industry, as those  
19 countries benefited from lower costs of labor (Cuming, 1984).  
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21 The new government led by Chun Doo Hwan attempted to reduce the  
22 macroeconomic instability and to internationalize Korean enterprises with the 1982  
23 Comprehensive Economic Stabilization Program. Moreover, as it was happening in the  
24 major industrialized economies, South Korean economy started to be more open to  
25 international flows through participation to GATT and Uruguay Round (Lee *et al.*, 2010).  
26 Tariff and non-tariff barriers to trade started to decrease and constraints to foreign direct  
27 investments (FDIs) were removed. The Fair Trade Commission was created in 1980 with  
28 the aim to manage the liberalization processes and competition (Lim, 2012). The public  
29 strategy for science and technology (S&T) also changed. Up until then, the technological  
30 progress simply came from the acquisition of foreign technology. With the 1982 National  
31 R&D Program, public policies were focused on the development of domestic technologies.  
32 Through this program the government, supported by universities and private companies,  
33 targeted the research projects to be promoted were selected. R&D activity was largely  
34 supported through private investments. Private companies, especially the larger ones, had  
35 adequate financial resources to undertake even risky research projects and had a well-  
36 educated workforce suitable for research activities. The R&D department was gradually  
37 becoming one of the most important for economic performance of private companies,  
38 which could no longer exploit the cost advantages in order to compete on international  
39 markets. In this framework involvement of private actors and university in targeting S&T  
40 projects allowed the government to get access to information extremely relevant for the  
41 decision-making processes related to industrial policy. Indeed, as argued by the literature  
42 on the topic (see, e.g., Hausmann and Rodrik, 2002), a systemic approach to industrial  
43 policy, involving all the relevant actors, appeared as way to bridge the informative gap  
44 between government and targets of intervention, mitigating possible *government failures*.  
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48 Apparently, during the 1980s South Korea experienced a discontinuity in the  
49 industrial strategy of the government, probably also in light of a new international context,  
50 where Washington Consensus was suggesting a drastic reduction of the public role in  
51 economic dynamics. In this context some observers argued that industrial policies  
52 implemented in the 1960s and 1970s were the cause of important problems of overcapacity  
53 in Korean heavy industries, which led to strong macroeconomic imbalances in 1980s (Park,  
54 2005). Accordingly, during this period the emphasis shifted from growth-first policies to  
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4 the consolidation of growth with stability and from a government-led economy to a private-  
5 led one (Koh, 2010).

6 However, according to some others (see, e.g., Lim, 2012) this shift was more formal  
7 than substantial and the state kept an important power in the economy. Indeed, during the  
8 1980s the government approved some other selective industrial policies, such as anti-  
9 competitive measures aiming at rationalizing and restructuring the industrial sectors that  
10 were suffering from overcapacity (i.e. energy sectors, automotive and machinery industry).  
11 Along with the introduction of tax benefits for companies operating in these sectors, the  
12 government supported the erection of barriers to entry in specific markets and imposed  
13 some mergers and acquisitions. This ultimately generated an increasing in market  
14 concentration and size of industrial groups (the so-called *chaebol*), which *de facto* were the  
15 only entities with the necessary resources to acquire businesses in crisis. The reorganization  
16 was generally conducted according to the principle that there would be a *chaebol* for each  
17 industrial sector (Cumings, 1984). These measures were extended to many more sectors in  
18 the second half of the decade, with relevant impact on the ability of South Korea to  
19 compete in international markets.  
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23 As a conclusion, the “big push” of the 1960s and 1970s, where the government had  
24 assumed a sharply interventionist role in the economy, had led in the 1980s to completely  
25 different industrial structure and ability to compete in international markets. The upgrade of  
26 the Korean economy was *per se* enough to justify a change in industrial approach that start  
27 to rely more on market dynamics, but with modalities that allowed the government to keep  
28 control on competition through R&D policies and markets concentration.  
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### 31 3.3 The period until the 2008 crisis

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33 Liberalization trends continued during Roh Tae-woo and Kim Youg-sam’s  
34 administrations, in office during the 1990s. The government approved the measures  
35 contained in the 1993 Five-Year Plan as agreement with the private sector, after a *bottom-*  
36 *up* decision-making process. The plan indicated the will of the public entity to reduce its  
37 direct presence in the economy and to favor private economic initiative. Furthermore, the  
38 Economic Planning Board was suppressed and its tasks were transferred to the new  
39 Ministry of Strategy and Finance in 1994.  
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41 The financial crisis that burst in 1997 in Southeast Asia contributed to further change  
42 the role of the state in the economy. Important interventions in this period refer to rescue  
43 packages approved in favor of the financial sector, consisting in bailing out the two largest  
44 banks of the country, tightening the regulation for financial institutions and creating the  
45 Financial Supervisory Commission (Lee *et al.*, 2007; Koh, 2010). Moreover, to obtain from  
46 IMF the necessary loan to cope with the crisis, South Korea accepted to implement IMF’s  
47 structural adjustment programs, which demanded public interventions for macroeconomic  
48 stability, rigorous monetary policies, markets liberalization, privatization of public  
49 companies, and fiscal austerity (Koh, 2010).  
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51 Nevertheless, whilst apparently the government was shrinking its role in South  
52 Korean economy during these years, at the end of the 1990s emerged clearly a new  
53 important public function related to foster technological innovation. In 1999 the Korea  
54 Knowledge-Based Economy Master Plan opened a new phase in government’s innovation-  
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oriented measures. Hong *et al.* (2007) and Woo and Suh (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 4). 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 partner, including the United States 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 per cent 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).

#### [TABLE 4]

#### 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 been a new change of perspective in politics for industrial development in South Korea. With the liberalizations of the 1980s and 1990s, the Korean government had certainly moved to some extent towards 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, 2014). 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

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4 about skill mismatch and over-education, emerged in recent years. Indeed, latest statistics  
5 show a relevant share of workers with high educational levels (58 per cent in 2016 of the  
6 workforce) coupled with rising youth unemployment rates (constantly increasing in 2012-  
7 2016 period) (Lee, 2017; Lee *et al.* 2018).

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9 Following this general goal, the Plan identifies six main strategic lines of intervention  
10 (see Table 5).

### 11 [TABLE 5]

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16 In this context, one of the most important aspect of the plan is the relevance conferred  
17 to small and medium enterprises (SMEs) and to venture capital. Indeed, a well-known  
18 characteristic of the Korean industrial structure is that it is dominated by the so-called  
19 *chaebols* (namely huge corporations), which are often under the control of a single family  
20 that operates in several diversified sectors. However, Korean economy is also characterized  
21 by a huge number of a small or medium enterprises that coexist with these concentrations  
22 of economic power. In this scenario tackling SME's problems could be essential to reach  
23 key industrial objectives. Specifically, the most critical issues affecting the SMEs are, on  
24 the one hand, the hard competition suffered from Asian manufactures (and in particular  
25 from the Chinese one) and, on the other hand, the dependence on supply contracts with  
26 larger companies (Eichengreen *et al.*, 2015). This latter point directly refers to the need for  
27 a better «economic democracy». With this expression, the government supports the idea  
28 that a higher level of equality within the Korean industrial system and a greater cooperation  
29 between SMEs and *chaebols* are fundamental for future economic development and in  
30 particular for bridging the gap existing in economic performance between SMEs and large  
31 enterprises (see Table 5, number 2). For instance, productivity of the small firms is only the  
32 28 percent of big firms' productivity (OECD, 2014).

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

42  
43 Along with general measures supporting SMEs, government attention is focused on  
44 specific industries deemed of strategic relevance for South Korean economy. Shipbuilding,  
45 machinery manufacturing, chemicals and automotive industry are the traditional sectors  
46 monitored by the government as a fundamental part of the national industrial system (Lee *et*  
47 *al.*, 2013). However, several advanced industries are increasing enormously their relevance  
48 and are object of particular attention from the government. In this context ICTs and related  
49 industries (such as the production of office equipment, semiconductors and communication  
50 devices, except the software industry) have shown very high performance in recent years  
51 (Eichengreen *et al.*, 2015). Moreover, specific support is given to thirteen new key sectors,  
52 among which nanotechnologies, biotechnologies, robotics, bio-artificial devices,  
53 autonomous vehicles and green industries (MOTIE, 2014).

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4 In this context green economy occupies certainly a special place in government plans.  
5 The National Strategy for Green Growth 2009-2050 and the 2009 Five-Year Plan for Green  
6 Growth prove the efforts of the country in this direction. Large amounts of resources (108  
7 billion allocated in five years) have been made available for green projects, like R&D for  
8 eco-innovations and the renovation of old polluting plants (Jones and Yoo, 2011).  
9

10 Along with manufacturing, the phenomenon of the *tertiarization* of the economy is  
11 more and more evident in South Korea. In 2005 the 59 percent of the Korean value added  
12 was created in service sectors (see Table 1), although the level of productivity of these  
13 sectors remains below the level reached in manufacture (OECD, 2014). The government is  
14 pushing forward the so-called *knowledge-based* services in order to promote a more  
15 balanced and sustained growth of the whole economy and increase productivity in the  
16 tertiary sector (Lee, 2016). Specifically, the Three-year Plan for Economic Innovation  
17 (2014-2017) has identified health care, finance and logistics as three key areas to focus on  
18 (MOSF, 2014c). In this context particularly important are medical assistance and personal  
19 services, given the rapid aging of Korean population. Although Korean health system is  
20 generally considered to be of good quality (Eichengreen et al., 2015), the challenge in this  
21 area is to succeed in attracting more patients and investors from abroad and further increase  
22 the sector performance. Among the measures implemented to this goal, there is for instance  
23 the possibility for high-quality and specialized foreign hospitals to open branches in Korean  
24 Free Economic Zones (MOSF, 2014c). In this framework, the Jeju Free International City  
25 Development Center is a project to make the island of Jeju, in the south of the peninsula,  
26 the reference medical center for East Asia (Goldstein, 2013, p. 67).  
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## 31 **5. A picture of South Korean structural change**

### 32 *5.1 Data and methodology*

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35 After the historical overview of South Korean industrial policy, this section aims at  
36 empirically analyzing the structural adjustment of the country. The idea is not to assert a  
37 direct causal relation between policy actions and structural development of the economy.  
38 As we discussed at the beginning of the paper (and as we will focus again on this topic in  
39 final remarks), there are *many* factors that have pushed Korean industrial development and  
40 government intervention is just one element of the framework acting in complementarity  
41 with others. Thus, this section wants to capture how the Korean *system*, as a whole,  
42 historically performed regard to industrial change.  
43

44 To this goal, methodologically we build a composite indicator – the Economic Performance  
45 Index (EPI) – which ranks the South Korean manufacturing sectors according to their  
46 economic performance. Sectoral performance is synthesized in a composite indicator by  
47 considering five variables describing the main economic record achieved by the different  
48 industries:  
49  
50

- 51 1. value added
  - 52 2. employment
  - 53 3. gross fixed capital formation
  - 54 4. labor productivity
- 55  
56  
57

## 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 an high performance to those sectors that achieve high performance in one or more variables (this is useful to emphasize in the analysis the role of sectors with very high performances). The formula of the Economic Performance Index (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 Economic Performance Index 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 base of their economic performance. This exercise is performed twice. For the first application we use data for 15 industrial sectors defined at 2-digit level of detail, for the period 1963-2012. In the second application we collect more detailed data (at 3-digit level of detail) and obtain rankings of 56 sectors for 2011 and 2012.

### 5.2 Results

The graphs below 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

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4 evident for the industries of food and tobacco (ISIC 15-16), for the textile sector (ISIC 17),  
5 and for the manufacturing of wearing apparel and leather products (ISIC 18-19). All these  
6 sectors are high in the rankings between the 1960s and 1970s, as shown in Figure 1. The  
7 decline starts in 1980s for food industry and textile and only in the 1990s for the production  
8 of wearing apparel, thanks to excellent performance in terms of exports.  
9

#### 10 11 [FIGURE 1]

12  
13 Figure 2 show the performance of heavy industries, with a specular pattern compared  
14 to the light ones. Despite some fluctuations in the trend, the constant rise of capital-  
15 intensive sectors is clear from the 1970s, especially for the manufacturing of petroleum  
16 products (ISIC 23), for the machinery industry (ISIC 30-33) and for the automotive  
17 industry (ISIC 34-35). At the end of our time series, in the 2012 these three industries  
18 occupy the first three position in the ranking (Figure 2).  
19  
20

#### 21 22 [FIGURE 2]

23  
24 To sum up, the results of this first application show a gradual rise of capital-intensive  
25 industries over time and, at the opposite, the continuous loss of economic performance for  
26 labor-intensive industries. In general, we can state that this is consistent with the trends  
27 highlighted in the historical analysis, namely the initial prevalence of light industries and  
28 then the emergence of heavy and chemical ones in the Korean industrial structure.  
29

30 With the second application, we look at the rankings in more detail. Our purpose now  
31 is to identify economic performance of *sub-sectors*. Table 6 exhibits the final results in  
32 terms of the first ten and the last three positions in 2011 and 2012. The results show that the  
33 rankings relative to the two years are very similar. Consistently with historical trends, at the  
34 first places of the rankings we find some sub-sectors related to chemical industries. For  
35 instance, biotechnology, which has been recently targeted by the Korean government as one  
36 of the key sectors for future economic development, is included in Manufacture of basic  
37 chemicals. Very high economic performance is also shown by other key industries, such as  
38 motor vehicles, electrical equipments and shipbuilding. Specifically, the sub-sectors related  
39 to the manufacture of electronic components, general and special machinery, and office  
40 equipment occupy positions between the 8<sup>th</sup> and the 19<sup>th</sup>. Regarding sub-sectors important  
41 for environmental issues, the results indicate good performance for automotive (5<sup>th</sup>  
42 position) and manufacture of electric motors and generators (13<sup>th</sup>), but lower performance  
43 is shown by processing of nuclear fuel (22<sup>nd</sup>) and manufacture of batteries and electric  
44 accumulators (39<sup>th</sup>). Finally, despite “health industry” has more recently attracted  
45 considerable attention in the Korean economic development, medical instruments and  
46 appliances have reached a quite low performance (32<sup>nd</sup> position in ranking). Generally this  
47 more detailed analysis shows a rather heterogeneous picture of the Korean economy, where  
48 the government is targeting (according to the recent Plans) both industries with very high  
49 performances and sectors with low economic records (but endowed with high potential in  
50 terms of *meta-economic* value, including health security and environmental quality).  
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[TABLE 6]

**6. Concluding remarks: government failures in a systemic view.**

This paper has considered South Korean historical structural change, from an 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 seems 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.



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4 First, the Korean experience reveals how important was to have a rather  
5 homogeneous pool of interests in the society. The equal distribution of land and wealth at  
6 the beginning of the industrialization process was essential to define a collective interest  
7 around the goals of industrialization and economic growth and to share benefits of  
8 development. In particular it was the civil society and a student revolution to create the  
9 popular pressures that constrained the new government to create institutions and strategies  
10 for economic development. In this context the general level of education of the population  
11 (Rodrik, 1995; Booth, 1999), since the Japanese domination, was creating people ready to  
12 actively participate to the economic and political life of the country, binding in a  
13 fundamental way industrial processes and government's actions to the supervision of civil  
14 society.  
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16  
17 Second, concerning the mechanisms of policy implementation, public investments in  
18 strategic industries were not provided in an "aseptic" contest, regardless the historical  
19 circumstances and of different interests at stake. On the contrary, industrial policy was  
20 implemented in a peculiar (formal and informal) institutional framework involving the  
21 relationship between public bureaucracy and private sector. Indeed, South Korea has been  
22 characterized by a *reciprocal control mechanism* that has worked through the concession of  
23 different incentives to the private sector on the bases of the achievement of certain  
24 performance defined by the government (Amsden, 2001). The presence of this *reciprocal*  
25 *control mechanism* was an essential element to control for the effectiveness of the industrial  
26 policies, mitigating potential sources of government failures. Indeed, what is typical of this  
27 mechanism is that it works only if the bureaucracy is independent enough to resist external  
28 pressures. In this context, the rent-seekers (i.e. private subjects that try to influence  
29 decision-making processes), cannot succeed in distorting public actions toward particular  
30 interest. In the Korean industrialization, few powerful *chaebols* were not interested in  
31 participating in rent contests and there were no other interest groups with sufficient power  
32 to influence governmental decisions (Chang, 1994). Moreover, concerning cultural  
33 characteristics, Confucianism promoted meritocracy, morality and honesty, in particular for  
34 employed in public offices (Bertoldi, 1996), since they perceived their role as direct involve  
35 in the collective wellbeing. All these aspects contributed to the strength of Korean  
36 government, described as a «Bureaucratic-Authoritarian Industrializing Regime [...] ubiquitous  
37 in economy and society: penetrating, comprehensive, highly articulated, and  
38 relatively autonomous of particular groups and classes» (Cumings, 1984, p. 28).  
39

40  
41 To note that a *systemic* approach to industrial policy, involving all the relevant actors  
42 of the system, continued also after the 1980s, when apparently South Korea experienced a  
43 shift in industrial strategy, with a reduction of the public role in economic dynamics in  
44 favor of freer markets. Indeed, markets liberalization occurred through a *bottom-up* decision-  
45 making process, where industries were "ready" for a more competitive context and granted  
46 their consent to the government. This strict relationship between government and national  
47 industry could further contribute to mitigate government failures by helping to bridge the  
48 informative gap between government and targets of intervention.  
49

50  
51 Third, all the domestic conditions mentioned above intertwined with an international  
52 context particularly favorable to South Korean economic growth. Indeed, good export  
53 performances were essential to Korean industrialization and these were facilitated by a  
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reduction in barriers to trade in advanced economies and decreasing international transport costs.

To conclude, there were 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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*Table 1. Manufacturing value added (share on total manufacture, selected years).*

	1950	1960	1970	1980	1990	2009
Light industries:	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
Heavy industries:	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 and OECD.*

*Table 2. 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. & 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.*

Table 3. Value added for economic activity (share on total GDP, selected years).

Year	Agriculture	Mining and quarring	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.

Table 4. Main economic indicators (1996-2004, selected years).

	1996	1997	1998	1999	2000	2004
GDP per capita (US\$)	12197	11176	7355	9438	10841	15898
GDP real growth (%)	7.2	5.8	-5.7	10.7	8.8	4.9
Net exports (US\$)	-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 5. Strategies and tasks in the Three-Year Plan for Economic Innovation.

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>	
a) Venture capital and startups	Institutionalization of <i>crowd funding</i> ; creation of the Future Creation Fund (500 billion won)
b) 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>	
a) New products	Support through <i>public procurement</i> system
b) 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
c) Startups: accessing foreign markets	Support for internationalization from public consulting centres in Korea and foreign countries (Global Startup Support Centre)
d) Cooperation between small, medium and large enterprises	Promote cooperation projects and outcome sharing systems between SMEs and <i>chaebol</i>
e) Training and human resource shortages	Cooperation between SMEs, local governments and training centres to improve the matching between human resource demand and supply
<i>3. Promote new markets and new industries</i>	
a) 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)
b) Software industry	Improve software education and internet security. Development of cloud computing and of Big Data analysis. Creation of Korea Digital Contents Fund (400 billion won) digital contents industry (music, games, movies)
c) Biomedical, Nano-Technology, Green Industries	Support for the development of strategic industries through public funds
<i>4. Foster global creative talent</i>	
a) 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)
b) Domestic inflow of creative talent	Creation of a "Startup Visa" for foreign young entrepreneurs that start new businesses in Korea
<i>5. Strengthen the innovation capacity of science, technology and ICTs</i>	
a) Research activity and commercialization of research outcomes	40 per cent increase in public funds for basic research; support for young people with creative ideas
b) Innovation capacity and ICTs	Investments in new generation communication technologies (5G, next-generation Wi-Fi, realistic media)
c) Regional innovation of Universities	Creation of regional organizations for technology planning and management

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6. Create a creative economic culture

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a) Creative culture	Encourage the development of new ideas; creation of “Creative Korea” online portal with information about <i>creative economy</i> strategy
b) Fusing creative ideas with public resources	Open access of government data for private citizens (Public Information Supply and Use Stimulation Act)
c) Innovating government working methods	New communication methods between administrative agencies to improve cooperation; use of comprehensive analyses of big data for policy decisions

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*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)*

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

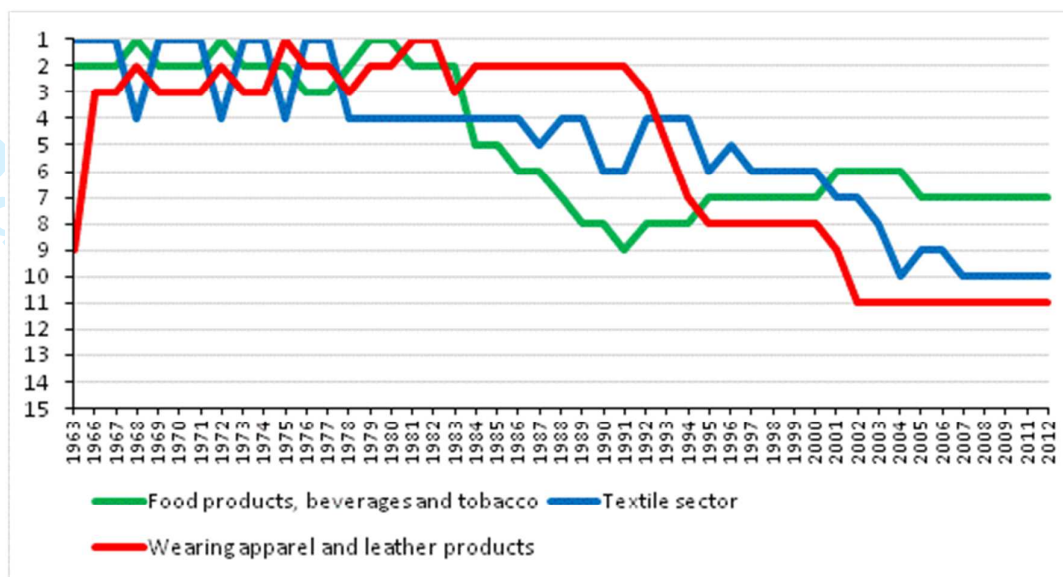


Figure 2. Positions in ranking of selected heavy sectors (1963-2012).

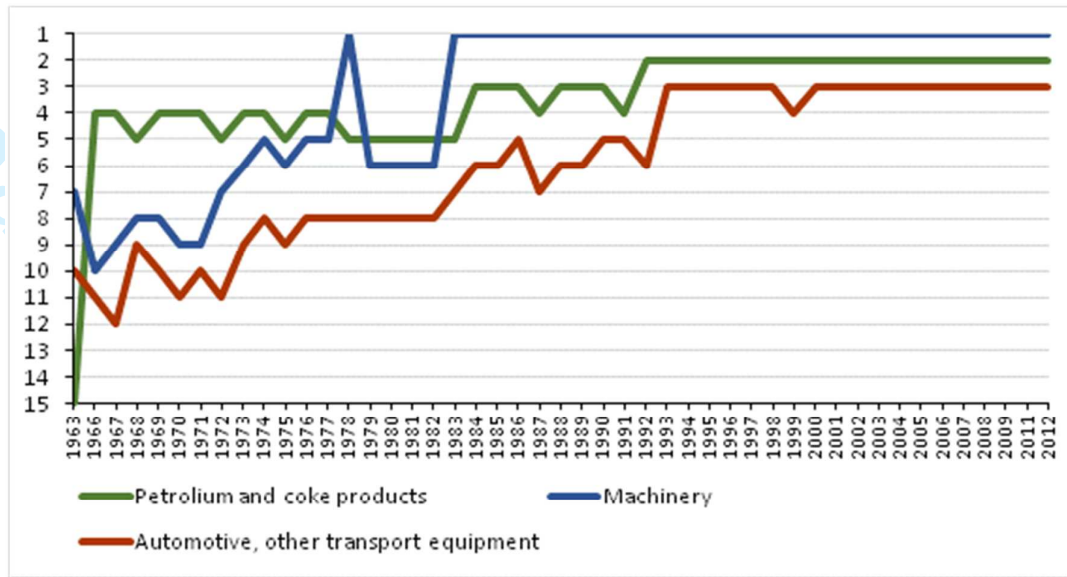


Table 6. Results of the second application (56 sub-sectors, ISIC 3-digit, 2011 and 2012).

Pos.	2011	2012
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 planing of wood	333 Manufacture of watches and clocks
56	231 Manufacture of coke oven products	231 Manufacture of coke oven products