

SCHOOL OF ECONOMICS AND MANAGEMENT

Industrial Policy and Inter-Industrial Upgrading:
A Flying Geese Perspective on South Korea's Manufacturing Transformation

by

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Abstract:
This paper explores South Korea's manufacturing transformation in the second half of the 20th century through the lens of the Flying Geese model, thereby investigating the role of industrial policy in guiding inter-industrial upgrading. Employing a historically contextualised descriptive analysis with detailed quantitative data, this paper aims to evaluate whether differential tariff and tax schemes influenced inter-industrial upgrading patterns from low-technology to high-technology manufacturing industries between 1972 and 1996. Results demonstrate a clear sequential shift from low- to high-technology manufacturing industries in alignment with the Flying Geese model. Industries receiving preferential policy treatment through lower tariff reductions and higher tax incentives consistently recorded higher growth rates. These findings contribute to broader debates on state-led economic development, suggesting that strategically and carefully designed government interventions can effectively foster structural upgrading in developing countries.

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1 Introduction

Over the course of the past years, the global consensus on the virtues of free trade and non-interventionist neoliberal economic policies that had defined economic agendas since the end of the Cold War has started to fracture. The most prominent manifestation of this shift can be found in the Trump administration's recently introduced tariff-led industrial strategy, which has driven a deep wedge into the consolidation of global markets. Aiming to reshore manufacturing and correct allegedly unfair trade imbalances, this return to state-led industrial policy (IP) reflects a broader revaluation of the decade-old neoliberal orthodoxy embodied in development agendas such as the Washington Consensus. This pervasive shock to the global economic order has brought IP and the East Asian 'developmental state' model back to the centre of attention among scholars and policymakers.

The exceptional economic transformation that East Asian nations experienced in the second half of the 20th century, popularly termed the 'East Asian Miracle' by the World Bank, provides an insightful counterpoint to the neoliberal development paradigm and has sparked countless academic debates about the underlying policy mechanisms (Birdsall et al., 1993; Juhász et al., 2024; Rodrik et al., 1995; Stiglitz, 1996; Wade, 2003). While proponents of neoliberal economic thinking emphasize free-market mechanisms and macroeconomic fundamentals, the East Asian Miracle economies and especially the Asian Tigers of South Korea, Taiwan, Hong Kong, and Singapore have managed to join the ranks of Western developed economies under the aegis of a broad set of strategic IP interventions. South Korea in particular, transitioned from a war-torn and impoverished economy in the 1950s to a global manufacturing powerhouse within just a few decades. The fact that South Korean policymakers heavily relied on IPs such as differential tariff schemes, sector-specific tax incentives, and preferential credits cannot be disputed (Chang, 1993; Choi & Levchenko, 2025; Choi & Shim, 2022; Kim, 1991; Kim et al., 2021; Lane, 2022; Lee et al., 2012; Rodrik et al., 1995; Yoo, 1993). Less consensus exists about the question whether these IP can be seen as the cause of South Korea's and the Asian Tigers' rapid economic transformation. Even though many neoliberal scholars refute the importance of IP for the East Asian Miracle, the emergence of novel quantitative methods has shifted government interventions in East Asia into a more favourable light (Choi & Levchenko, 2025; Juhász et al., 2024; Lane, 2022).

This paper aims to investigate South Korea's manufacturing transformation through the lens of the Flying Geese model of inter-industrial upgrading, initially proposed by Akamatsu (1962) and later adapted to explain industrial upgrading patterns in East Asia from a regional

perspective (Kojima, 2000; Kumagai, 2008). More specifically, this paper explores the following research question:

Did industrial policy play a role in guiding the process of inter-industrial upgrading in South Korea's manufacturing sector according to the dynamics of the Flying Geese model?

By employing a historically contextualised and data-informed descriptive analysis, this paper seeks to answer whether manufacturing industries receiving greater government support through preferential tariff and tax schemes experienced more rapid upgrading along the Flying Geese trajectory. The remainder of this paper is structured as follows: Section 2 briefly recapitulates the historical context behind South Korea's economic transformation in the 20th century. Section 3 reviews the theoretical and empirical literature on the Flying Geese model and industrial policy. Section 4 describes the methodology and data used in this paper. Section 5 presents the analysis as well as a discussion of the findings regarding the relationship between IP and inter-industrial upgrading. Finally, section 6 reflects on the main findings and discusses their broader implications in the light of the debate outlined above.

2 Historical Context

After 35 years of Japanese colonisation (1910-1945) and the Korean War (1950-1953), South Korea found itself in an economically devastated state. Domestic capital levels were low, infrastructure was largely destroyed, and an industrial base was largely non-existent (Chang, 1993; Kim, 1991; Lee et al., 2012). With the intention of creating a military, ideological, but most importantly, an economic counterweight to the Soviet-backed North Korea, the United States subsequently provided substantial amounts of military and economic support to the country (Wade, 2003). In 1962, one year after President Park came to power, South Korea's Economic Planning Board introduced the first five-year development plan (FYP), thereby placing economic development at the centre of state strategy (Lee et al., 2012). The first 5YP, which would be followed by many more, introduced IP focussing primarily on the pursuance of an import-substitution strategy and the promotion of light manufacturing industries (Lee et al., 2012; Rodrik et al., 1995). Economic growth began to pick up sharply and the government, recognising the need to accumulate foreign currency in order to import inputs necessary for further industrial expansion, transitioned to a strategy of export-oriented industrialisation with a focus on labour-intensive manufacturing goods (Lee et al., 2012; Rodrik et al., 1995). In this period, policymakers began to intensively employ IP measures such as tariffs and targeted

preferential credits in order to protect and promote newly emerging export industries (Lee et al., 2012; Rodrik et al., 1995). One year after the implementation of the third 5YP (1972-1976), the government launched the heavy and chemical industry (HCI) drive (Chang, 1993). The aim of this strategy was to shift from light to capital- and technology-intensive industries (Lee et al., 2012). Furthermore, the Nixon Doctrine and the increasing attrition of US military resources in the Vietnam War, resulted in high numbers of US troop withdrawals from South Korea until 1971. As a result, the HCI drive also came as a reaction to geopolitical concerns and aimed at strategically building up industries congruent with the increased demand for domestically produced military capabilities, inter alia, steel, shipbuilding, petrochemicals, and machinery (Lee et al., 2012). During this period, the state became increasingly involved in the direct control of large firms in the respective HCI sectors, thereby laying the groundwork for the later rise of chaebols (Lee et al., 2012). Despite the fact that the 1970s saw a number of macroeconomic strains on the global market, not least due to the two oil shocks in 1973 and 1979, the HCI drive catalysed technological upgrading in South Korea and paved the way for the emergence of globally competitive manufacturing industries (Lane, 2022). The combination of the former with the assassination of President Park in 1979 brought about a wave of political and economic uncertainty (Lee et al., 2012). This led to a shift in IP strategy with a retreat from broad sectoral intervention and a move towards efficiency and firm-level targeting (Kim et al., 2021; Lee et al., 2012). While this solidified the economic position of the chaebols, key industries continued to receive preferential policy treatments such as beneficial tax rates and tariff protection (Lee, 1996; Yoo, 1993). This changed throughout the latter half of the 1990s when South Korea became increasingly integrated into global markets and progressively adopted a more neoliberal economic policy stance (Lee et al., 2012). South Korea joined the WTO in 1995 and the Asian Financial Crisis, which led to a deep economic recession, triggered structural adjustment programs in accordance with IMF guidance (Wade, 2003). In the following decades, South Korea continued its path of economic and political liberalisation, thereby becoming an important player in technologically advanced industries such as electronics, automotives, and shipbuilding (Choi & Shim, 2022).

3 Theory and previous research

3.1 The Flying Geese model of economic development

3.1.1 Akamatsu's original Flying Geese framework

The Flying Geese (FG) model is a frequently reoccurring theme in academic debates about the mechanisms of the impressive post-war catch-up process of East Asian economies (Dowling & Cheang, 2000; Kasahara, 2019; Kojima, 2000; Kumagai, 2008; Widodo, 2008). However, what many of the recent articles within this field understand as the FG model, differs decisively from its theoretical origin. Therefore, this section will explore the theoretical cleavages of the FG model through an evolutionary lens. The roots of the FG model can be traced back to Akamatsu's early publications about industrial development in latecomer economies (Kumagai, 2008). These articles were originally published in Japanese, and Akamatsu's first English article about the FG model appeared in 1962 (Akamatsu, 1962). Akamatsu introduced the analogy of a 'wild-geese-flying pattern', *gankō keitai* in Japanese, to describe the process of industrial upgrading in relatively backward open economies over time. Even though this process depends on trade interactions with advanced economies, the original framework did not focus on the notion of regional transmission which is seen as characteristic for the FG model today (Kojima, 2000). It can therefore be labelled as the 'one-country' model (Kumagai, 2008). Furthermore, Akamatsu's (1962) FG theory contains two central elements (Kojima, 2000; Kumagai, 2008). The first describes the process of intra-industrial upgrading, i.e. the evolution of a single industry over time, the second the process of inter-industrial upgrading, i.e. the evolution of the economy-wide production structure along the spectrum of industry sophistication[1] (Akamatsu, 1962).

Figure 1 shows the first part of Akamatsu's framework, the process of intra-industrial upgrading.

[1] Here, the degree of sophistication refers to the technological complexity of an industry's respective output goods

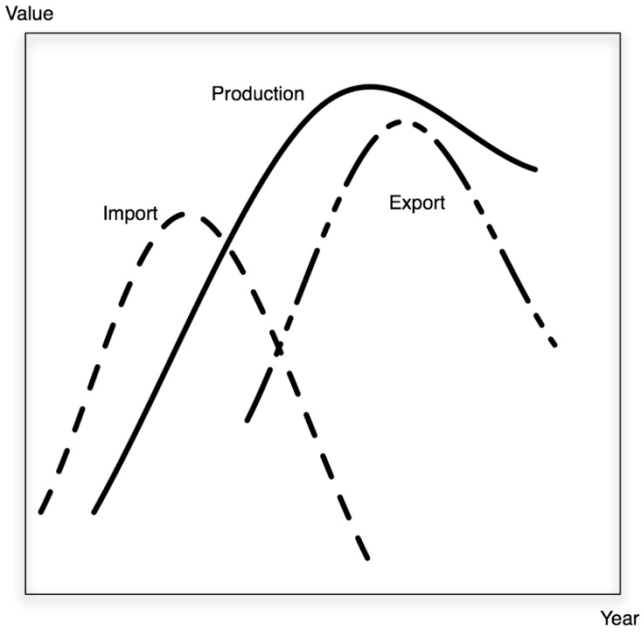


Figure 1: Intra-industrial upgrading according to Akamatsu's original framework
Source: Kumagai, 2008, p. 5

As figure 1 shows, the theory describes the evolution of imports (IM), production (Y), and exports (X) within a specific industry over time. For the purpose of simplification, one can think of it as the production of a single homogenous good. What this framework states is that, as an economically backward country (country A) opens up to trade, it will begin by importing a specific good (good A) which is relatively advanced for its existing production structure from a more advanced economy (country B). Then, as demand for the good increases and the country A advances its production structure, it will increase the production of good A until domestic production output is high enough to offset import demand. With production output increasing further, country A will subsequently be able to produce an amount of good A that exceeds domestic demand, thereby allowing it to export the surplus production output to international markets. The framework essentially describes country A's industry strategy moving from import-substitution to export-orientation. One can easily see how international trade flows are inherent to this model, one might even view them as the fundamental driver of this process, but it also becomes clear that the theory's explanatory power is far short from yielding macro-scale implications about the inter-regional transmission of industrial production. Furthermore, the 'wild-geese-flying pattern' analogy stems from the layout of the IM, Y, and X curves in figure 1. Akamatsu (1962, p. 11) notes that "wild geese fly in orderly ranks forming an inverse V", just as the curves describing the process of intra-industrial upgrading in latecomer economies do. IM, Y, and X develop in a set sequential order, thereby each following an inverse V-shaped path, even though timing and magnitude depend on the industry under consideration as well as

on country-specific idiosyncrasies. This is the FG model of intra-industrial development according to Akamatsu's original framework.

The second part of Akamatsu's FG framework concerns the increase in sophistication of output goods that a relatively backward country experiences as its economy advances (Akamatsu, 1962; Kojima, 2000; Kumagai, 2008). Figure 2 shows this development.

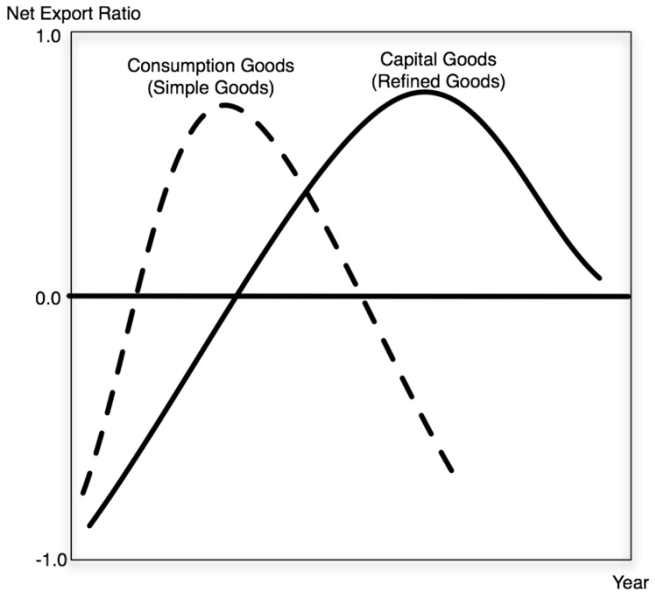


Figure 2: Inter-industrial upgrading according to Akamatsu's original framework
Source: Kumagai, 2008, p. 7

According to this process, as a latecomer country catches up with more advanced economies, it will experience a shift towards a higher degree of sophistication of its output goods. Due to the processes described in figure 1, country A moves towards a higher export ratio. Initially, the latter is confined to industries producing crude goods. As the economy of country A advances, the production of relatively simple goods decreases and gives way for industries producing more sophisticated goods, i.e. goods with a higher technological content or a more complex production process. Hence, and in combination with the mechanisms of intra-industrial upgrading, country A's export structure is moving from relatively simple industries towards relatively sophisticated industries over time. Akamatsu (1962) states that intra-industrial upgrading will first commence in industries producing crude goods and consumer goods before it expands to industries producing refined goods and capital goods when country A has reached a certain level of economic progress. Similar to the FG model of intra-industrial upgrading, the curves in figure 2 follow a sequential inverse V-shaped pattern, and hence, figure 2 describes the FG model of inter-industrial upgrading.

In the face of what is being understood as the FG model in most of the recent literature, this original dichotomous framework by Akamatsu requires a number of remarks. First, even though Akamatsu (1962) made use of numerous statistical examples from Japan's and economic development path, it should not be understood as a theory confined to Japan or the broader East Asian context. Even though most recent studies view the FG model as an attempt to explain the 'East Asian miracle', Akamatsu originally intended to develop a universal theory of the economic catch-up process in a Gerschenkronian manner. It also has to be mentioned that Akamatsu's publication preceded the economic transformation of the newly industrialised economies (NIES) of Hong Kong, South Korea, Singapore, and Taiwan. The economic catch-up of the NIEs after 1960 was in no way foreseeable at the time of the FG model's formulation in the 1930s, and its original intent therefore has to be seen as detached from the East Asian miracle. Second, and connected to the preceding observation, Akamatsu's (1962) early account of the FG model does not contain the FG framework of regional transmission that can be found in many of the more recent studies. Although Akamatsu's (1962) original framework proceeds from the assumption that the inter-industrial upgrading process depends on international trade flows and implicates that other developing countries make up for the fall in output of simple consumption goods as country A moves towards a more sophisticated production structure, these regional transmission mechanisms appear only as subordinate sidenotes and the emphasis clearly lies on the two theories outlined above.

3.1.2 The Flying Geese framework of regional transmission

In 1985, at a time when the catch-up growth of the NIE's was already well under way, Okita extended Akamatsu's FG framework in an attempt to explain the regional transmission of industrial development in the Asia Pacific region (Kojima, 2000; Kosai & van Tho, 1994; Okita, 1985). In this context, Okita (1985) notes that the success of the NIEs after 1960 can be traced back to a pattern of regional industry transmission in the Pacific region which had been pioneered by Japan's industrial emulation of the US and had later successfully been followed by the NIEs and progressively also by the ASEAN economies. Okita's framing of the FG model can be seen as the precursor to the modern perception of the FG paradigm in the Asia-Pacific context (Kojima, 2000; Kosai & van Tho, 1994). Figure 3 shows the process of regional industrial transmission in East Asia. As the 'leading goose' Japan progresses along the horizontal axis, i.e. along the spectrum of industrial sophistication from garments to steel, the 'follower geese' incrementally take up the respective output voids left behind by their predecessors.

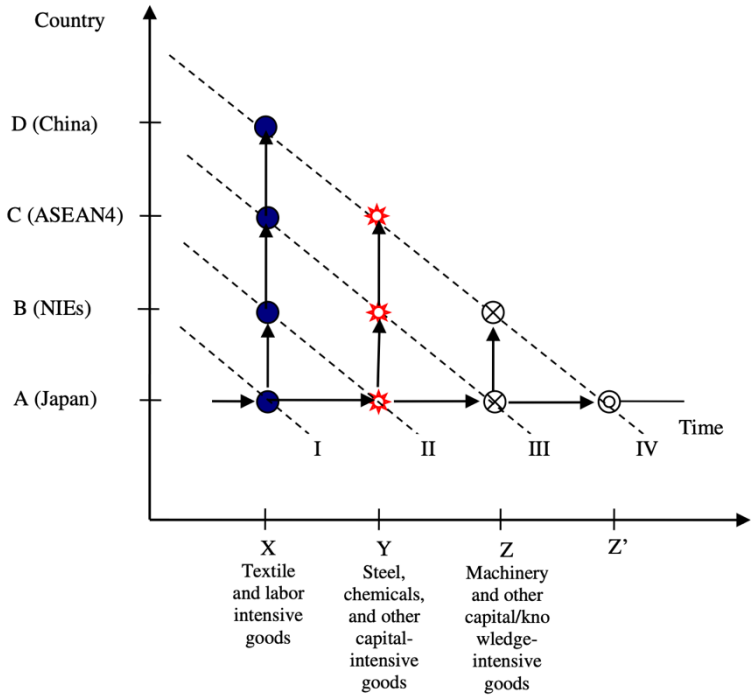


Figure 3: Flying Geese Framework of regional transmission in East Asia
Source: Tri, 2017, p. 11, adapted from (Kojima, 2000)

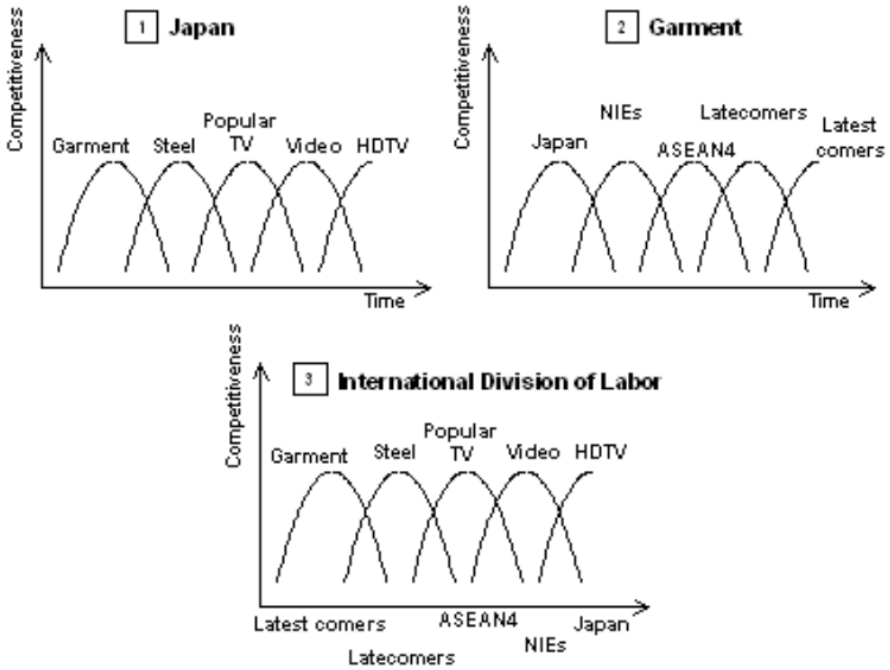


Figure 4: Intra-industrial and regional FG frameworks in East Asia
Source: Lin, 2011, p. 9, adapted from GRIPS Development Forum

Figure 4 depicts a more granular illustration of this dynamic. In a simplified manner, panel 1 shows the process of inter-industrial upgrading on the basis of the Japanese example, i.e. the horizontal move from X to Z in figure 3, panel 2 the regional transmission of the garment

industry in the East Asia region i.e. the vertical move from A to D for industry X in figure 3, and Panel 3 the process of inter-industrial upgrading from a multi-national perspective.

Statistical evidence clearly confirms the existence of an East Asian development dynamism in the form of a FG pattern of regional industrial transmission similar to the one depicted in figure 3 (e.g. Dowling & Cheang, 2000; Fukasaku, 1992; Rana, 1990). These studies were pioneered by Rana (1990) and Fukasaku (1992) who in the early 1990s introduced the empirical foundation on which many following studies would build upon (Kasahara, 2019). By estimating shifts in CAs across the East Asian region, they find statistical evidence for the regional catch-up growth in the form of a regional FG pattern (Fukasaku, 1992; Rana, 1990). For the period from 1965 to 1984, Rana (1990) finds that most of the NIE and ASEAN4 countries experienced significant shifts in their CA's, i.e. they underwent significant structural change, and that these shifts were largely consistent with the hypothesised FG pattern from Japan to the NIEs and from the NIEs to the ASEAN4s, whereas most of such regional shifts of CA's happened in the post-1973 period when the NIEs increasingly began to produce more complex goods. Fukasaku's (1992) study confirms this pattern, thereby finding significant evidence for CA shifts in manufacturing sectors from Japan to South Korea and Taiwan, and from the NIEs to Indonesia and Thailand during the 10 years from 1979-1988. Additionally, Fukasaku (1994) observes significant shifts from inter-industrial to intra-industrial trade patterns of manufacturing sectors in the region during the mid 1980s. The latter serves as evidence for the FG pattern in the form of intra-industrial upgrading. Since the publication of these studies, various authors have adopted and extended the Rana/Fukasaku framework to qualitatively assess the validity of the FG model of regional transmission. By extending the period under investigation and exploring regional CA shifts by industry or degree of good sophistication, the results of these studies act as profound empirical evidence for the existence of a regional FG model in the East Asian development context according to Okita's framework (Das, 1998; Dowling & Cheang, 2000; Ha, 2005; Hiratsuka, 2005; Kumagai, 2008; Widodo, 2008). While evidence for the transmission of industries from the ASEAN4s to subsequent followers is ambiguous, the catching up process of Japan, the NIEs, and the ASEAN4s clearly followed the regional FG pattern in the aforementioned order (Das, 1998; Dowling & Cheang, 2000; Fukasaku, 1992; Ha, 2005; Hiratsuka, 2005; Kumagai, 2008; Rana, 1990; Widodo, 2008). Therefrom, the remaining question is which mechanisms guided and perhaps continue the guide the remarkable FG-style catch-up growth of the East Asian region?

Scholarly opinions about this issue remain ambiguous (Kasahara, 2019). Kojima, the principal student of Akamatsu, asserts that the international transmission of industrial

production mainly proceeds through the foreign direct investment (FDI) channel (Kojima, 2000). This view is shared by numerous academics (Dowling & Cheang, 2000; Fukasaku, 1992; Kosai & van Tho, 1994). Thus, the regional transmission of industries in East Asia is often viewed to be the outcome of free market mechanisms.

However, while FDI can constitute a channel of cross-border industry transmission, i.e. it can be a proximate factor, it cannot be seen as the ultimate cause of the regional FG process, i.e. it cannot be a fundamental factor. In free markets, economic agents conduct outward-looking investments in the prospect of higher anticipated returns, and hence, the fundamental factors have to be sought in the incentives guiding the allocation of FDI. Therefore, the underlying economic dynamic of the regional FG model can be traced back to the concept of comparative advantage (CA), which in turn depends on a country's endowment with production inputs (Dowling & Cheang, 2000; Kojima, 2000; Lin, 2011; Rana, 1990). As the leading goose progresses economically, i.e., as it moves from being abundant in low-skilled labour towards being abundant in capital and high-skilled labour, its CA shifts from low-skill labour-intensive sectors (e.g. garments) to high-skill capital-intensive sectors (e.g. electronics) (Kojima, 2000). In the face of trade-openness, firms in the leading goose's low-skilled labour-intensive sectors find it profitable to move production to latecomer countries (follower geese), given that these countries now possess a CA in such sectors (Dowling & Cheang, 2000; Kojima, 2000). Through spillover effects, these FDI inflows then enable the follower geese to climb the industrial ladder themselves, thereby in turn shifting the CA to the next round of follower geese (Kojima, 2000). These determinants of these dynamic shifts in CAs can be seen from two perspectives.

On the one hand is the neoliberal perspective, which views free market mechanisms as the key factor guiding production and export specialisation according to CAs. As the leading goose progresses economically, its low-skilled labour-intensive sectors experience strong wage increases, which in turn diminish the country's CA in such sectors (Kojima, 2000). Because wage levels in low-skilled labour-intensive sectors in follower geese remain low, these countries gain a CA in such sectors. Profit-maximising firms then seek to outsource production to the follower geese via the FDI channel.

On the other hand is the policy-choice perspective, which views East Asia's FG-style catch-up growth as the outcome of deliberate and market-distorting government policies, which actively altered CAs in a way that allowed follower geese to skip certain stages of economic development through technological leapfrogging and thereby allowed them to rapidly catch up with the leading goose.

It is important to note that the two proposed explanations for East Asia's growth model are in no way mutually exclusive, but that both could have provided certain elements for East Asia's FG catch-up growth at the same time. The question that remains to be answered is whether free-market mechanisms or government interventions contributed greater to the East Asian miracle, and whether the latter would have been possible in the absence of one or the other.

3.2 Industrial policy and shifting comparative advantages in East Asia

3.2.1 What is industrial policy?

In order to conceptualise industrial policy (IP), this paper will adopt the following definition by Warwick (2013), which itself is an adaption of the definition provided by Pack & Saggi (2006):

> Industrial Policy is any type of intervention or government policy that attempts to improve the business environment or to alter the structure of economic activity toward sectors, technologies or tasks that are expected to offer better prospects for economic growth or societal welfare than would occur in the absence of such intervention (Warwick, 2013, p. 16).

In other words, IP can be seen as a set of deliberate government interventions which alter economic actors' incentives in a way that leads economic outcomes to diverge from free-market outcomes and that is consistent with the overarching economic objective of the policymaker. Furthermore, IP can work in a way that enhances free-market outcomes, i.e., it works in the same direction, but it can also work contrary to free-market outcomes, i.e., it works in the opposite direction. IP can take various forms, with some of the most utilised interventions being sector- or firm-specific subsidies, import protection measures such as tariffs or import restrictions, or financial repression (Juhász et al., 2024). The following table provides an overview of some of the most common IP measures.

IP measure	Description
Import protection (tariffs, import restrictions)	▪ Protection of selected domestic sectors by reducing external competition through tariffs or an outright prohibition of certain good imports
Subsidisation (direct subsidies, tax exemptions, targeted credits)	▪ Increases the competitiveness of selected domestic sectors by providing financial funding, tax exemptions, or subsidised loans for targeted sectors
Financial repression (repressed interest rates, capital controls, regulation of financial institutions)	▪ Generally, financial repression describes a fiscal structure in which interest rates are being artificially repressed, thereby providing incentives for firms to take out loans and invest at the cost of reduced returns on savings for private households ▪ Reduces the interest burden on government debt
State ownership	▪ Allows policymakers to directly control firm strategy, thereby influencing sectoral trends ▪ Frees state-owned enterprises from profit-maximising objective, thereby allowing for long-term strategic alignment
R&D incentives (subsidies, tax exemptions, targeted credits)	▪ Increases long-term industry competitiveness

Table 1: Description of selected conventional IP measures

3.2.2 Can industrial policy spur economic growth?

The question whether IP can be effective in spurring economic growth has long been a fundamental point of controversy in the realm of economic development (Criscuolo et al., 2022a; Harrison & Rodríguez-Clare, 2009; Juhász et al., 2024; Lane, 2020; Pack & Saggi, 2006; Warwick, 2013). The fact that this debate is inherently traversed by the foundational ideological cleavage between neoliberalism and interventionism additionally obstructs the inference of objective academic insights (Amsden, 1994; Birdsall et al., 1993; Wade, 2003). While credible quantitative evidence for the effectiveness of IP has been rather scarce up until the 2010s, not least because of issues regarding data availability and empirical identification strategies, the methodological progress in the field of econometrics over the past 15 years has allowed for more reliable academic assessments of IP outcomes, thereby gradually shifting scholarly opinion towards a more positive view on the matter (Juhász et al., 2024; Lane, 2020). As the focus of this paper lies on vertical IPs related to the process of inter-industrial upgrading, i.e. IP in the form of infant industry protection and sectoral IP, horizontal IPs aimed at alleviating environmental concerns, strategically altering supply chain structures, or improving digital infrastructure, are of subordinate relevance to this discussion. Nevertheless, it has to be mentioned that the latter set of IPs has climbed back to the forefront of political agendas in recent years, particularly in the wake of structural economic shifts after the COVID-19 era and the resurgence of geostrategic concerns in the wake of the seemingly imminent end to the

global peace order of the past three and a half decades (Criscuolo et al., 2022b). Regarding the former set of sector-specific IPs, recent quantitative research increasingly paints a positive picture regarding the long-term effectiveness of such policies (Choi & Levchenko, 2025; Hanlon, 2020; Juhász, 2018; Juhász et al., 2024; Kim et al., 2021; Lane, 2020; Liu, 2019). What is central to this assessment, is the fact that none of the prementioned authors claim any kind of universally positive relationship between sustainable economic growth and the use of sectoral IP. The list of unsuccessful IP examples is extensive. Rather, the specificities of policy design, the adaptability of policy measures, and the in-depth consideration of preexisting framework conditions are crucial for the successfulness of sector-specific IP (Criscuolo et al., 2022a; Lee et al., 2012; Stiglitz, 1996).

3.2.3 Industrial policy and the East Asian Miracle

Ever since the World Bank's 1993 report brought the growth mechanisms behind the postbellum catch-up growth of the East Asian miracle economies to the forefront of academic attention, the debate about IP as a possible facilitator of East Asia's unparalleled economic success has been one of the most debated issues in this realm (Birdsall et al., 1993). While this report largely lists neoliberal market fundamentals such as macroeconomic stability, market openness, high levels of private domestic savings, and rapid human capital growth as the key mechanisms of the East Asian Miracle, it concludes that the impact of interventionist policies should be viewed with care, thereby refraining from attributing positive economic outcomes to the use of IPs (Birdsall et al., 1993). While it recognises the large-scale deployment of a wide range of IPs, it concludes that the impact of interventionist policies should be viewed with great caution, thereby refraining from attributing positive economic outcomes to the use of IPs (Amsden, 1994; Birdsall et al., 1993).

Viewing the findings of the World Bank's policy report against the backdrop of the historical context in the countries under study, however, poses a number of questions. First, can the fact that most of the East Asian miracle economies, inter alia, South Korea and Taiwan, embarked on their path of economic success under authoritarian rule be reconciled with the imperatives of neoliberal economic governance, i.e., is it credible to assume a strict institutional dichotomy in the form of extractive political institutions and inclusive economic institutions? Second, is it plausible to assume that concrete *ex ante* accounts of strategical economic guidance such as South Korea's Five-Year-Plan which predetermined, inter alia, the level of industry-specific interest rate differentials and tariff rates, did only affect economic development through free market mechanisms, i.e., publicly announced IP measures did not

significantly contribute to economic outcomes in a positive way, even though their stated objectives have been reached (Lee et al., 2012)? Third, does it make sense to assume that market-distorting government interventions did not play a substantial role during the East Asian miracle although the East Asian region is essentially the only region that managed to systemically[2] catch up with the West since the second world war, i.e., can one assume that the East Asian miracle economies are the only economies which strictly adhered to the neoliberal principles preached by the Washington Consensus while every other developing region failed to do so?

Partly in light of these considerations, many scholars have refuted the assessment of the 1993 World Bank report and have argued for a more mixed explanation of the East Asian Miracle, which recognises the importance of neoliberal elements such as openness to trade or the compliance with macroeconomic fundamentals, while at the same time highlighting the importance of government interventions such as targeted investment subsidies and industry-specific preferential credits (Amsden, 1994; Rodrik et al., 1995; Stiglitz, 1996; Wade, 2018). In that manner, Rodrik (1995) argues that the economic transformation of the NIEs South Korea and Taiwan, despite from being aided by beneficial initial conditions such as high human capital and low economic inequality, was decisively facilitated by IPs such as credit subsidies and tax incentives. Stiglitz (1996) asserts that the high degree of government involvement in the identification of strategically important industries and their subsequent support through IPs such as the deliberate allocation of credit, financial repression, control over capital movements, and regulations which aimed to maximise technology transfers from FDI, all significantly contributed to the East Asian region's impressive economic success. Moreover, Wade (2018) recognises the undisputable significance of neoliberal market principles and access to the world market in the NIE's catch-up growth, but emphasises the economic contribution of coordination and adaptability advantages of East Asia's development state and IPs such as strategic trade quotas, targeted credit allocation, as well as infant industry protection.

What becomes clear from such considerations is that the complexity involved in the policymaking of the East Asian Miracle does not allow for simplified linear explanations. While it would be an irrefutable exaggeration to see IP and the development state as the sole cause of the East Asian Miracle, one has to acknowledge that ideology-driven ovations for neoliberalism and free market principles such as the 1993 World Bank report are far from

[2] That is, not just isolated countries, but all four of the NIEs and Japan achieved substantial and sustained convergence with Western levels of economic development

helpful for deriving empirically grounded policy recommendations for developing countries, and therefore, deny billions of people an inclusive path towards better living standards.

3.2.4 Industrial policy in the case of South Korea's economic transformation

Proceeding from that, and moving to the country under study in this paper, the use of IP during South Korea's economic catch-up process is well documented (Chang, 1993; Choi & Levchenko, 2025; Kim, 1991; Kim et al., 2021; Lane, 2020; Lee et al., 2012; Liu, 2019; Rodrik et al., 1995; Westphal, 1990; Westphal & Kim, 1977). As reliable empirical evidence for the efficiency of IP has been virtually non-existent up until the past decade, comprehensive quantitative proof for the case of South Korea is still confined to a relatively minor numbers of studies (Juhász et al., 2024). Nevertheless, the number of such accounts is increasing and there exist a handful of comprehensive and innovative studies in this realm.

Choi & Levchenko (2025) investigate the economic impact of the IP employed during South Korea's policy-induced heavy and chemical industry (HCI) drive from 1973 until 1979. More specifically, the authors study the impact of one of the Park administration's main IP tools, the selective allocation of foreign credit, on HCI firm's sales and on the economy on the macro level. Besides significant and positive short-term effects on firm's sales, they find that the selective allocation of foreign credit increased targeted firm's sales by 8.3 percent from 1982 until 2009. Moreover, these positive effects can be traced back to productivity gains, rather than to reduced competition through government interventions (Choi & Levchenko, 2025). Additionally, the authors utilise a general equilibrium heterogeneous firm model to estimate the long-term macroeconomic welfare effects of the policy. They find that the IP led to welfare gains of 3-4 percent over a period of 30 years, and that up to 75 percent of these gains can be explained through increases in total factor productivity (TFP). Therefore, South Korea's active control of foreign credit eligibility did not only significantly contribute to the economic performance of firms in the HCI sector but also brought about a significant and sustainable macroeconomic output expansion, thereby contributing substantially to South Korea's process of economic catch-up (Choi & Levchenko, 2025).

These findings are being complemented by Lane's (2022) highly elaborate study of the relationship between IP and industrial development during South Korea's HCI drive. By using the HCI drive as a natural experiment and employing a dynamic difference-in-difference identification strategy, the author studies performance differences in targeted versus non-targeted manufacturing industries in order to quantitatively assess the economic effect of infant industry protection policies. Similar to the results from Choi & Levchenko (2025), the author

finds that output growth in targeted HCI industries was more than double than that observed in non-targeted manufacturing industries, with productivity growth contributing significantly to this trend (Lane, 2022). Moreover, this positive IP effect in targeted HCI industries had durable performance effects even after the cessation of the policies in 1979 and significantly improved targeted sectors' CA compared to non-targeted industries as well as in a global comparison (Lane, 2022). Hence, Lane's (2022) findings not only confirm the effectiveness of IP with aid of state-of-the-art empirical identification strategies, but provides evidence on the efficacy of IP in the context of policy-induced alterations to the CA structure. The latter hints towards the importance of IP for South Korea's intra-industry upgrading process in a FG framework.

Similarly, Kim et al. (2021) draw on a difference-in-difference estimation strategy in order to explore the effect of IPs during the HCI drive, thereby comparing targeted versus non-targeted industry-region pairs. The authors explain the use of industry-region pairs with the fact that HCI IPs did not only aim to provide growth stimuli to selected industries through, inter alia, through differential tax rates and access to foreign credit, but also by funding industrial plants and complementary infrastructure in predetermined industrial regions, especially in the south-east of the country. While output and labour productivity experienced significantly larger increases in targeted industry-region pairs, the authors assert that plant-level productivity increases were entirely offset by efficiency losses due to resource misallocation on the industry-region level (Kim et al., 2021). Therefore, and in contrast to the two aforementioned studies, the authors also highlight the potential negative effects of market-distorting IP measures, without, however, denying the effectiveness of IP in accelerating industrial development.

Choi & Shim (2022), with the aid of a dynamic spatial general equilibrium model with heterogenous firm's technology adoption decisions, explore the lasting economic effects of the HCI drive IP of selective subsidies for foreign technology adoptions. The authors find that targeted HCI firms experienced sales and TFP increases of up to 50 percent, that the IP measure had significant regional spillover effects on the firm level and that the discussed government subsidies contributed significantly to South Korea's process of industrialisation, thereby increasing the GDP share of manufacturing by 15 percent and macroeconomic output by 10 percent in the longue durée (Choi & Shim, 2022).

In light of these empirical assessments, in can be concluded that IP did sustainably contribute to the economic transformation and industrial expansion of South Korea. While the findings of these studies differ in their proposed mechanisms and in the magnitude of the

estimated IP effects, they align with the assertion that IPs significantly altered industrial structures and CAs during South Korea's economic transformation.

4 Methodology and Data

4.1 Methodology

This paper employs a historically conceptualised and data-informed descriptive analysis in order to assess the relationship between IP and South Korea's process of inter-industrial upgrading in the manufacturing sector from the 1970s to the mid-1990s. Even though this analysis is based on detailed quantitative data, an econometrically grounded evaluation of causal effects is not intended. Rather, this paper seeks to derive insightful patterns in the data, thereby interpreting structural trends in the broader context of the relationship between the design of interventionist policies and the East Asian Miracle.

The entire analytical framework is being assessed against the backdrop of the aforementioned FG model of sequential inter-industrial upgrading along the spectrum of technological sophistication. Hence, this paper aims at evaluating whether South Korea's manufacturing transformation can be described by such a trajectory and whether IP served as a guiding state-led framework for steering it. This relationship is being assessed descriptively on the basis of graphical analyses of comparative growth metrics.

4.2 Data

The data utilised in this paper has been compiled from various sources. The primary dataset for this analysis consists of non-adjusted manufacturing value added figures in billion KRW at chained 2020 prices and covers the years 1953-2024. This core dataset decomposes total manufacturing value added data into 13 manufacturing industries for every year from 1970 onwards. The dataset has been obtained from the Korean Statistical Information Service (KOSIS) (KOSIS, 2025). To examine IP instruments, additional tariff and tax data is being implemented throughout the analysis. Tariff data comes from Yoo (1993) and tax data from Lee (1996). Description of the respective datasets is being provided throughout the following section.

5 Discussion: Industrial policy and inter-industrial upgrading

5.1 South Korea's path of inter-industrial upgrading

To investigate South Korea's process of inter-industrial upgrading, this section analyses trends in sectoral value-added figures using a dataset from the South Korean statistical office (KOSIS, 2025). In line with Eurostat's classification scheme, the 13 subordinate manufacturing industries have been categorised following the NACE Rev. 2 3-digit structure (Eurostat, 2025). An overview of the industries and the related technology classification can be found in table 2. Proceeding from that, figure 5 shows South Korea's process of inter-industrial upgrading from 1972, the year of the implementation of the third Five-Year-Plan which accompanied the HCI drive that started in the following year, until 1996, the year between South Korea's accession to the WTO in 1995 and the onset of the Asian Financial Crisis (AFC) in 1996. Taken together, the latter two events can be seen as a decisive turning point in the role of the South Korean government as a development state. While the WTO accession meant that South Korea suddenly had to adhere to neoliberal trade policies, the AFC and the following IMF bailouts resulted in ever-increasing international pressure to massively decrease government interventions and to liberalise economic structures (Choe, 2012; Lee et al., 2012; Wade, 2003). The horizontal axis of figure 5 displays a respective manufacturing industry's degree of technological sophistication according to the classification listed in table 2. The vertical axis shows an industry's growth rate in value added over the period under consideration. Each blue bubble corresponds to one of the 13 subordinate manufacturing industries from table 2, whereby bubble sizes indicate an industry's share of total manufacturing value added in the final year of the observed period. Several notable insights protrude from figure 5. First, South Korea's structural change in the form of inter-industrial upgrading is clearly visible. Growth rates of more technologically sophisticated manufacturing industries have been indisputably higher than manufacturing industries producing more rudimentary goods and this trend, especially when taking into account industry shares, holds across all four categories of technological complexity. While low-technology industries barely registered growth in relative terms, medium-low- and medium-high-technology industries grew significantly more, and the highly technologically complex computer and electronics industry registered the highest value added growth. This shows that over time, South Korea's economic structure transformed from being reliant on the production of crude goods such as textiles or manufactured foodstuffs, to

Subordinate manufacturing industry	Technological classification
1. Food, beverages products 2. Textile & leather products 3. Wood & paper products, printing & reproduction of recorded media	*Low-technology (1)*
4. Coke & refined petroleum products 5. Non-metallic mineral products 6. Basic metals 7. Fabricated metal products 8. Other Manufacturing, repair and installation of machinery & equipment	*Medium-low-technology (2)*
9. Chemicals & chemical products 10. Electrical Equipment 11. Machinery & equipment 12. Transportation equipment	*Medium-high-technology (3)*
13. Computer, electronic & optical products	*High-technology (4)*

Table 2: List of the 13 subordinate manufacturing industries and their respective technological classification

one producing highly specialised products such as technologically advanced computer and electronic equipment. Second, the extent and speed of South Korea's structural change in the last third of the 20th century is striking. When taking into account the fact that figure 5 covers observations from a timespan of merely 25 years, industry growth rates of more than 9.000 percent, such as in the 'computer, electronic and optical product' industry and in the 'electrical equipment' industry, are highly impressive. Nevertheless, one has to acknowledge that these industries started to grow from relatively low base levels in 1972, both at around 100 billion KRW, which means that their growth potential, inter alia, due to higher marginal returns of capital in these sectors, was significantly higher in comparison to sectors which already produced significant shares of manufacturing output at that time. In conclusion, while figure 5 does not allow for any inferences about the sequence of inter-industrial upgrading in a FG context, it does show that South Korea experienced significant inter-industrial upgrading towards more technologically sophisticated industries in its manufacturing sector in the latter half of the 20th century.

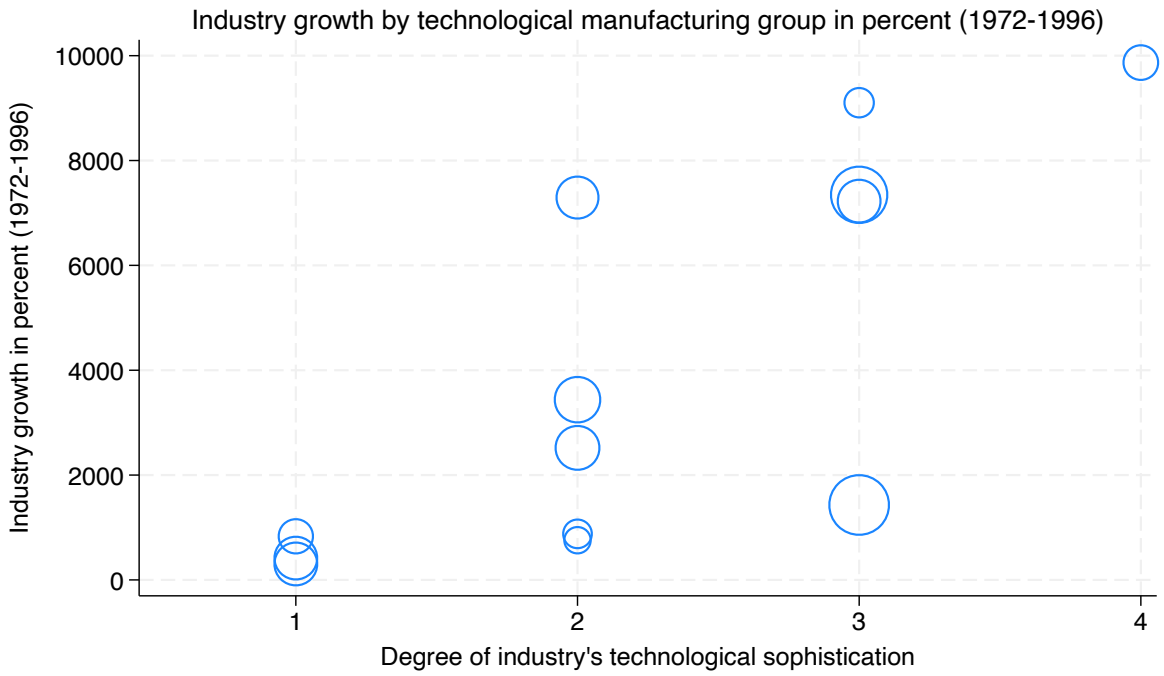


Figure 5: Industry growth by technological manufacturing group in percent (1972-1996), South Korea
Source: own analysis, data from KOSIS (2025)

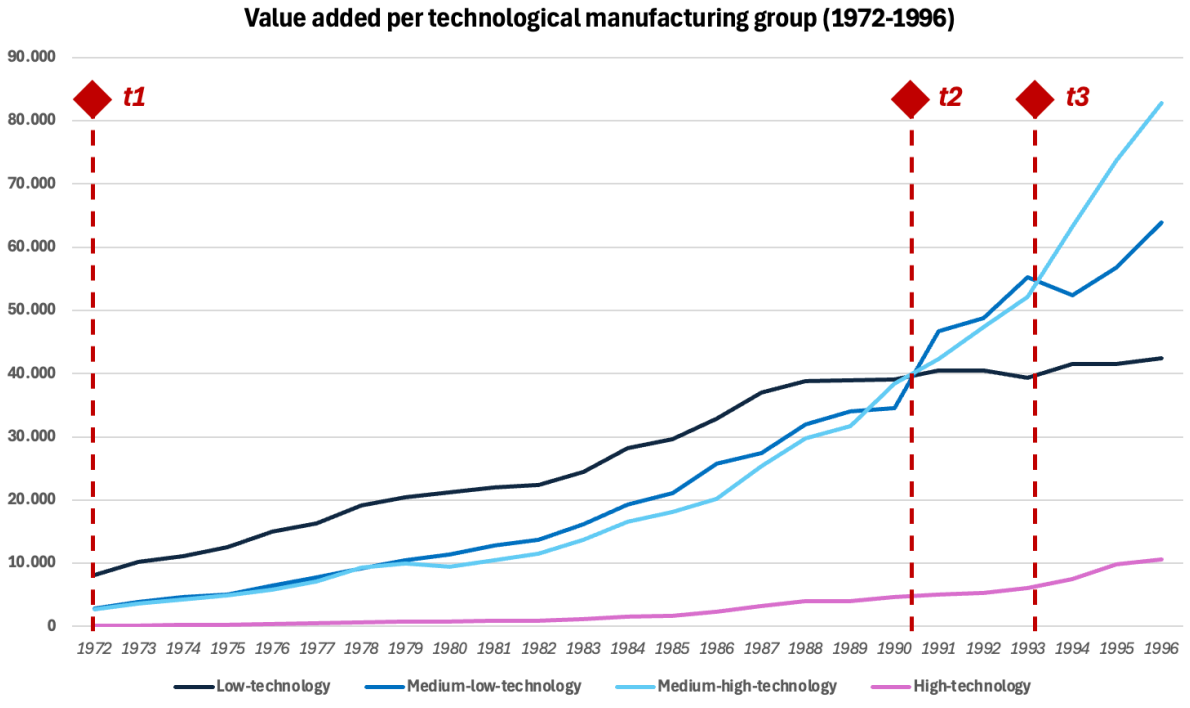


Figure 6: Value added per technological manufacturing group (1972-1996)
Source: own analysis, data from KOSIS (2025)

Building on that, figure 6 shows the evolution of total value added in billion KRW for the four technological manufacturing groups over time. Here, the FG pattern of inter-industrial upgrading becomes apparent. In period 1, denoted as *t1*, low-technology industries dominated

the structure of South Korea's manufacturing industries. While medium-low- and medium-high-technology industries initially recorded growth rates similar to low-technology industries, the high-technology industry did not experience significant growth rates. Then, in the 1980s, the growth rates of industries in both medium-technology groups picked up and surpassed growth in low-technology industries, while the latter entered a lasting period of stagnation. The high-technology industry, too, began to experience substantial growth towards the end of the 1980s. This trend continued and the value added of the medium-technology industry groups exceeded value added of the low-technology group in 1991. This marks the start of period 2, denoted as *t2*, in which industries of the medium-low-technology group contributed the most to manufacturing value added. At the same time, medium-high-technology industries continued to grow rapidly, thereby producing more value-added than low-technology industries. Finally, in 1994 which marks the beginning of period 3, denoted as *t3*, medium-high-technology industries overtook the medium-low-technology industries in value added, a trend that significantly amplified in the following years. Regarding the growth of the high-technology industry, it has to be noted that, while it is far from reaching the value added levels of the other three technology groups, its growth rate over the entire period has nonetheless been impressive. Whereas figure 6 does not do justice to this growth performance, figure 5 clearly shows that the 'Computer, electronic & optical product' industry recorded the highest growth rate from 1972 to 1996. Taken together, these trends correspond with the FG pattern of inter-industrial upgrading as shown paradigmatically in panel 1 of figure 4. Over the course of South Korea's economic catch-up growth, its manufacturing structure sequentially moved from being dominated by the production of low-technology goods towards primarily producing medium-low-technology goods, and finally medium-high-technology goods. The rise of South-Korea's high-technology industry is visible, even if it was still trailing the two medium-technology industry groups in 1996. Over the course of the past three decades, however, the high-technology industry has shot ahead of the medium-low-technology industries and currently accounts for 80 percent of the value added generated by medium-high-technology industries (see Appendix, Figure A1). Upon continuation of this trend, the high-technology industry group is set to become the largest contributor to cumulative value added, which means that South Korea's FG-style inter-industrial upgrading would be complete in the context of the industry classification proposed in table 2.

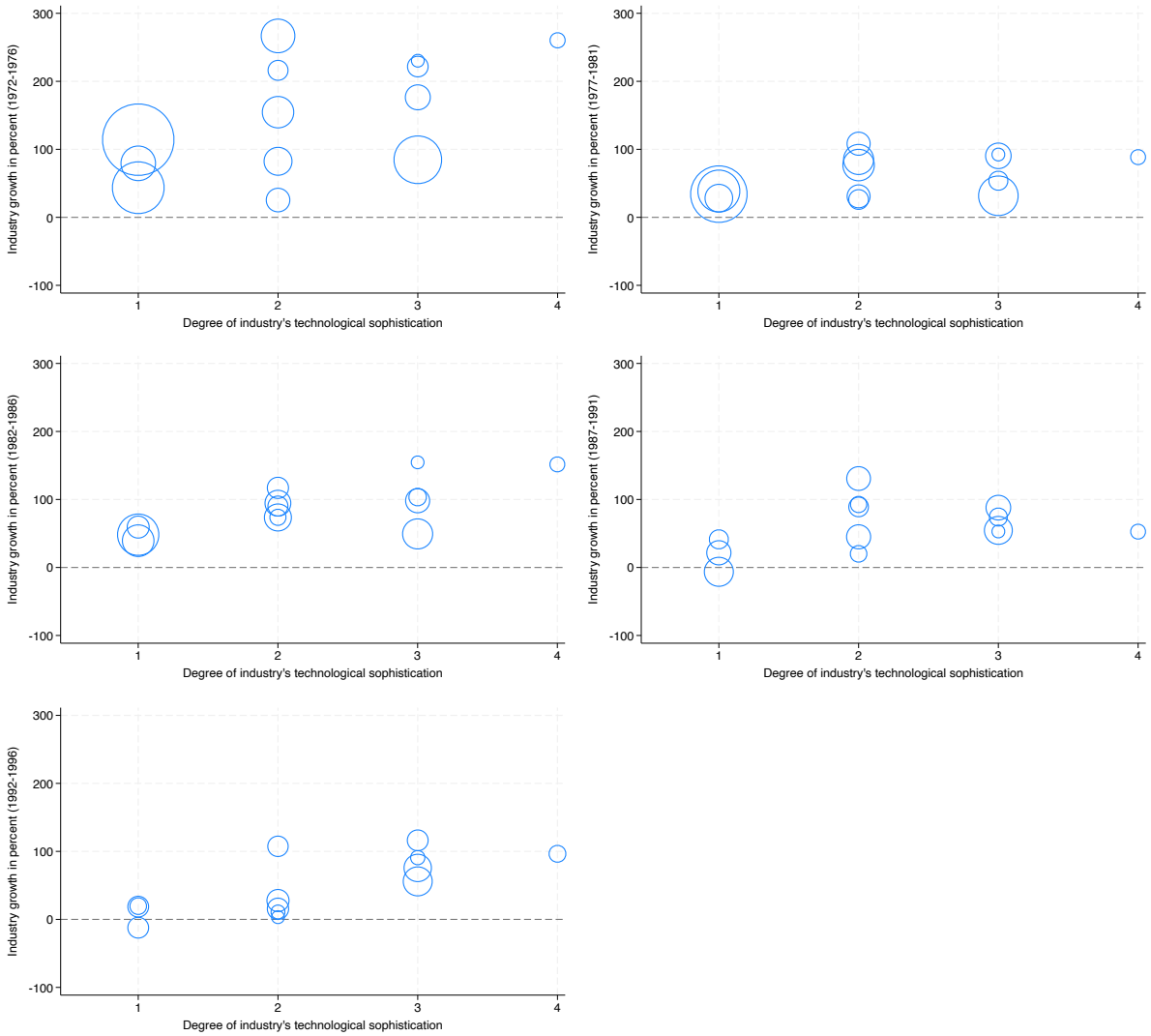


Figure 7: Growth rates of manufacturing industry technology groups per Five-Year-Plan period
Source: own analysis, data from KOSIS (2025)

Additionally, figure 7 provides a breakdown of manufacturing industry growth rates subject to the five 5YP periods between 1972 and 1996. Each of the five panels shows the same analysis as figure 5 for the five-year periods during the respective 5YPs, thereby providing additional insights into South Korea's temporal path of inter-industrial upgrading.

5.2 Industrial policy and inter-industrial upgrading

5.2.1 Tariffs

Tariffs are one of the most prominent IP tools (Juhász et al., 2024; Warwick, 2013). In the case of differential tariff schemes, tariff rates differ according to industry, and can therefore, if implemented selectively and considered, provide significant infant industry protection by reducing competition from world markets and incentivising the consumption of domestically

produced goods (Harrison & Rodríguez-Clare, 2009; Lane, 2022; Warwick, 2013). In the case of South Korea's catch-up growth, differential tariff schemes, inter alia, for the manufacturing sector, were widely deployed and contributed to the rapidity of its economic success (Chang, 1993; Kim, 1991). On the one hand, tariffs contributed to the rise of infant industries behind protective barriers, on the hand, they also played a vital role in the process of phasing out industries that policymakers viewed as obsolete (Chang, 1993; Kim, 1991; Lee et al., 2012). From the policymakers' perspective, differential tariff rates constituted a relatively simple measure to guide South Korea's production structure in the desired direction by filtering out partly unforeseeable and antagonising trends in world market prices. The remaining question is whether South Korea's differential tariff scheme only lifted growth rates of the manufacturing sector in a cumulative manner, or if it was indeed conducive to the process of inter-industrial upgrading in a FG framework on a more granular industry level. To answer this question, this section draws on historical tariff data from Yoo (1993), who compiled tariff data per manufacturing subsector for the years 1978, 1982, and 1988 from Input-output table estimations of the Bank of Korea. This analysis utilises actual tariff rates (ATR) instead of nominal tariff rates. The ATR is being calculated according to the following equation:

$$ATR_i = \frac{Tariff\ revenue_i}{(Total\ Imports_i - Imports\ for\ export\ production_i)} \quad (1)$$

, where *i* denotes manufacturing industries. The subtraction of imports for export production from the denominator is necessitated by the fact that South Korean policymakers exempted such imports from tariffs in order to incentivise exports of manufacturing goods (Yoo, 1993). The ATR entails a number of advantages over statutory tariff rates. First, it provides a far more accurate measure of the effectively realised tariff rate since it captures de facto tariff collection which can diverge from nominal rates due to legal waivers or ad hoc policy alterations. Second, it excludes goods which are imported for the purpose of re-exportation, thereby only focussing on goods competing in the domestic market. Third, the ATR adjusts for the composition of imports and thereby avoids overstating the realised rate of protection for industries which are highly dependent on the importation of intermediary goods. Therefore, the ATR provides a more realistic measure for the degree of protection of domestic industries. Moreover, tariff data from Yoo (1993) is being presented for 27 subcategories of the manufacturing sector. In accordance with the NACE Rev. 2 *n-2* rank methodology, these subsectors have been mapped to the 13 manufacturing industries listed in the KOSIS database (Eurostat, 2008). Subsequently,

the ATRs for these industries have been calculated by taking the average of the matched subcategories from Yoo (1993).

Figure 8 shows the relationship between tariffs and manufacturing subsector growth from 1978 until 1988. Hence, and despite observing the role of IP in a FG context, this analysis also differs from many statistical accounts (e.g. Choi & Shim, 2022, 2022; Kim et al., 2021; Lane, 2022) in the way that it regards the decade following the HCI drive instead of the HCI period itself. The vertical axis shows total growth of value added per manufacturing sector in percent, while the horizontal axis shows total ATR reduction per manufacturing sector in percentage points. Each blue dot in the scatterplot presents one of the 13 manufacturing industries listed in table 2 and the dashed red line is the regression line fitted to the 13 observations. Figure 8 shows a clear positive relationship between value added growth rates and smaller tariff reductions. Accordingly, manufacturing industries which experienced bigger decreases in ATRs over the eleven years between 1978 and 1988, experienced lower growth rates in the same time span. It has to be noted that the period under observation can generally be seen as a period in which South Korean policymakers scaled back economy- and industry-wide IP measures and instead began to rely more heavily on highly targeted interventions on the firm level (Lee et al., 2012). In addition, the second oil shock and the assassination of President Park in 1979 set an abrupt end to the HCI drive (Lee et al., 2012). Reduced demand for South Korea's HCI products in the early 1980s led the government to an IP strategy that was increasingly focused on maximising economic efficiency, inter alia, through phasing out strategically irrelevant manufacturing industries (Lee et al., 2012). Taken together, this can explain the broader trend of declining tariff rates across all manufacturing industries. Even though the sample size is rather small and therefore does not allow for causal inferences, this serves as an obvious indication for the beneficial economic effects that tariff-induced industry protection could have had in South Korea. While figure 8 provides insights into the role of tariffs for South Korea's economic transformation, it does not yield any clues regarding the inter-industrial upgrading process. Therefore, figure 9 offers a graphical breakdown of the relationship between tariffs and growth rates by the degree of manufacturing industries'

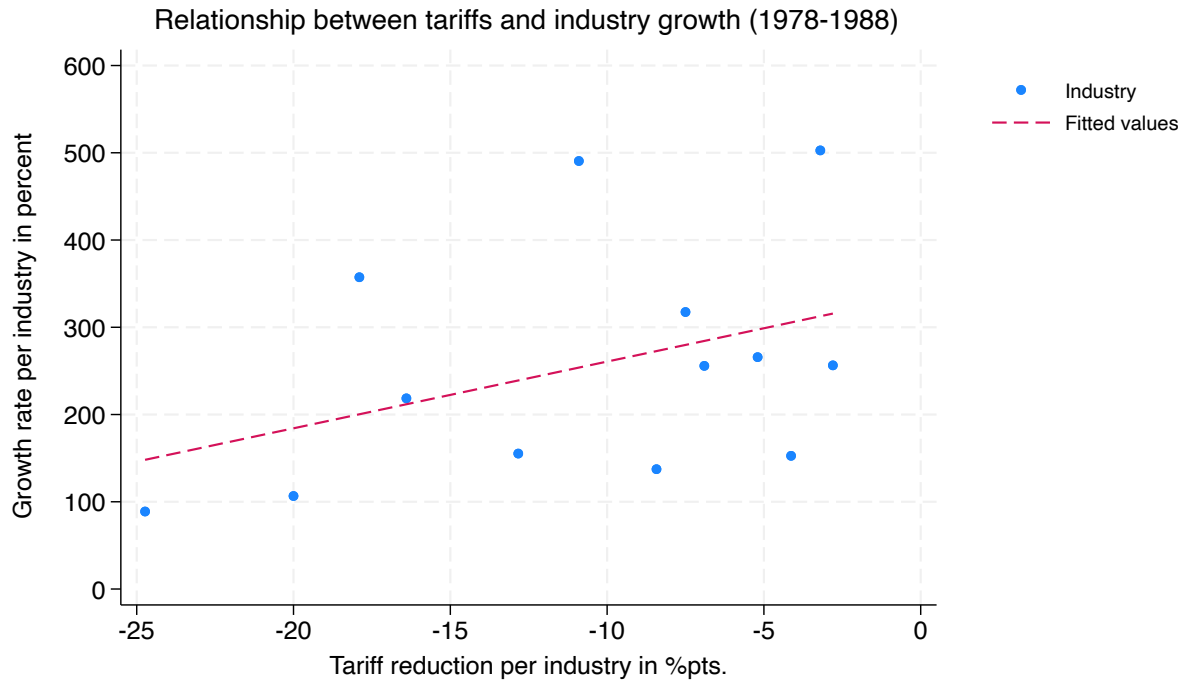


Figure 8: The relationship between tariffs and manufacturing industry growth rates (1978-1988)
Source: own analysis, data from KOSIS (2025) and Yoo (1993)

technological sophistication according to table 2. Panel 1 shows the average ATR decreases per technological manufacturing industry group in the 1978-1988 period and panel 2 shows the relationship between cumulative valued added growth rates and average ATR reductions by technological manufacturing industry groups for the same period. In panel 2, the technology group is being indicated by the respective labels next to the blue dots. From panel 1, one can see that tariff reductions in low-technology manufacturing industries were far higher than tariff reductions in the remaining technology groups. In combination with the insight from panel 2 that higher technology groups experienced lower reductions of average ATRs as well as higher growth rates of value added, this suggests that South Korea's differential tariff scheme contributed substantially to its process of FG inter-industrial upgrading. On top of that, the technology industry groups which were subject to the lowest reductions of ATRs are the same groups that experienced the highest growth rates, i.e. medium-high-technology industries grew the most while they underwent the smallest average tariff reduction and the same holds for the

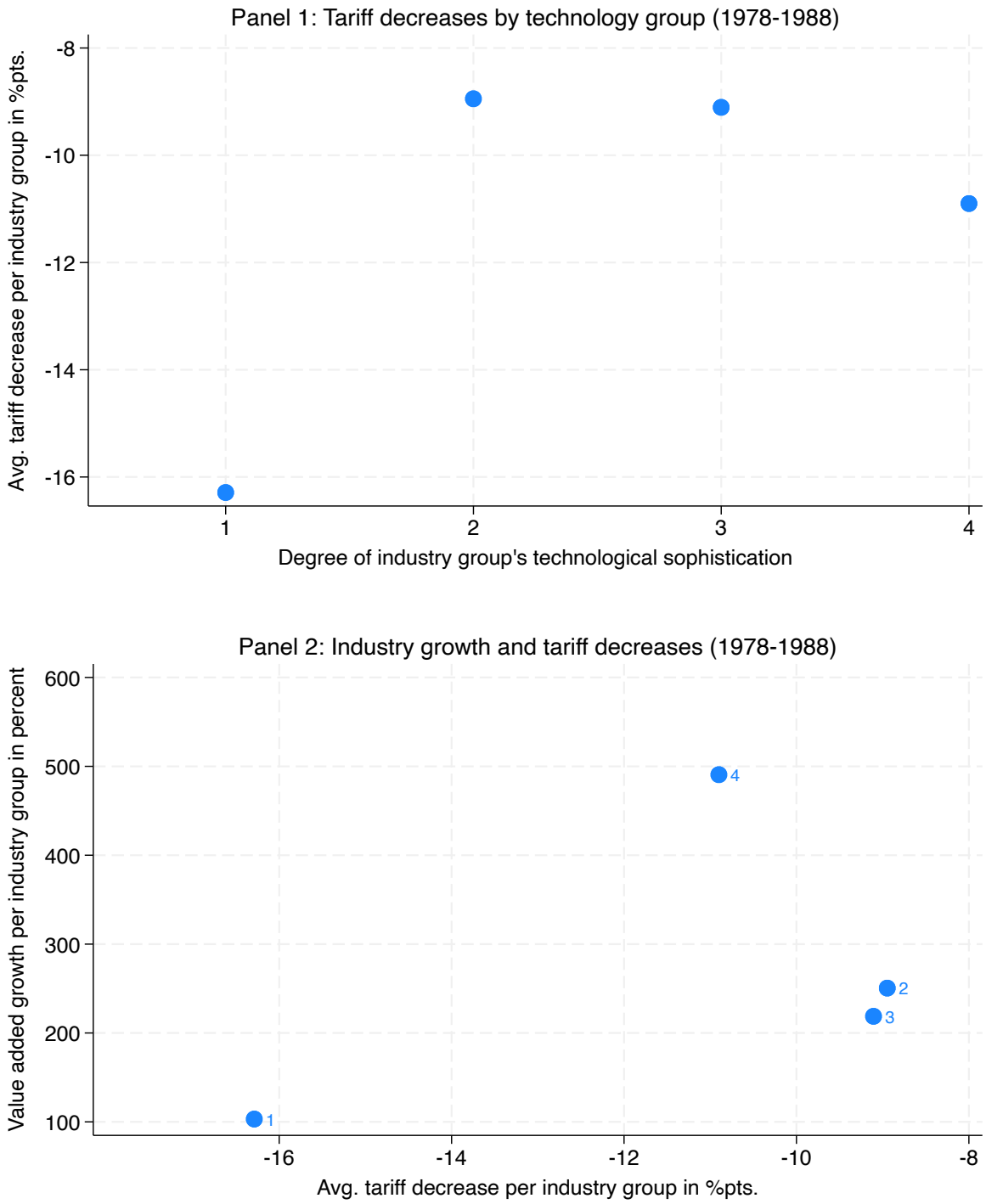


Figure 9: The relationship between tariffs and growth by technological manufacturing group (1978-1988)
Source: own analysis, data from KOSIS (2025) and Yoo (1993)

remaining technology groups. Moreover, when considering the panels of figure 7 which correspond to the time period studied in figures 8 and 9, i.e., panels 2 and 3, this pattern becomes even more apparent. This observation confirms the aforementioned supposition that South Korea's FG-style inter-industrial upgrading path can at least partly be explained by active government interventions such as differential tariffs.

5.2.2 Tax incentives

Besides tariffs, tax incentivisation also counts as one of the most used IP interventions (Juhász et al., 2024). This IP tool, too, has been widely employed in the case of South Korea's economic catch-up growth (Chang, 1993; Lee et al., 2012; Lee, 1996). More specifically, South Korea utilised a differential tax scheme under which tax rates differed between manufacturing industries, thereby strategically favouring selected industries (Lee et al., 2012; Lee, 1996). Such preferential tax schemes spanned a wide range of specific tax alleviations, inter alia, reduced taxes on intermediate input goods, reduced corporate tax rates, increased scope for depreciation deductions, investment tax credits, and tax allowances for export sales (Lee, 1996). Again, the question arises whether tax incentivisation contributed to South Korea's path of inter-industrial upgrading in a FG context. To answer this question, this analysis draws on tax data from Lee (1996), who calculates tax incentives by manufacturing industry from effective marginal tax rate (EMTR) data obtained by Kwack (1985). Hence, the tax incentive rates (TIRs) per manufacturing industry are being calculated according to the following equation:

$$TIR_i = Marginal\ statutory\ rate_i - \left(\frac{Pretax\ returns_i - Posttax\ returns_i}{Pretax\ returns_i}\right) \qquad (2)$$

, where *i* denotes manufacturing industries. For each manufacturing industry, the EMTR, the term in parentheses in equation 2, is being subtracted from the marginal statutory corporate tax rate in order to arrive at the effectively realised corporate tax rate. Furthermore, tariff exemptions on imported goods are excluded from these calculations (Lee, 1996). Thereby, the choice of data minimises the risk of tautological analyses in the face of the results obtained from figures 8 and 9. The original data is being presented for a set of nine manufacturing supergroups and for five time periods between 1960 and 1982 (see Appendix A2). As this analysis is concerned with datapoints from 1972 onwards, three periods (1960-1962, 1963-1967, and 1968-1972) have been dropped and the two relevant periods span the years 1973-1977 and 1978-1982. The data has been disaggregated to match the manufacturing industries listed in table A3 (see Appendix), which is also being provided by Lee (1996). This yields tax incentive rates for 38 manufacturing subcategories. In line with the NACE Rev. 2 structure, these 38 KSIC categories have then then been matched to the 13 manufacturing industries from

table 2 (Eurostat, 2008). Therefrom, average tax incentive data for the 13 manufacturing industries have been calculated by taking the subcategory averages in line with the described mapping.

Figure 10 shows the relationship between tax incentives and manufacturing industry growth rates between 1973 and 1982. The horizontal axis shows average tax incentive rates in percent, and the vertical axis shows value added growth rates in percent. Each of the blue dots represents one of the 13 manufacturing industries from table 2. The dashed red line is the regression line fitted to the industry observations. Panel 1 shows this relationship for the first period, the five years from 1973 to 1977, and panel 2 for the second period, the five years from 1978 to 1982. Furthermore, both panels show an unambiguously positive relationship between tax incentives and value added growth by industry. Manufacturing industries which enjoyed higher tax incentives grew distinctively faster over both five-year timespans. This indicates that IPs in the form of tax incentives were an effective tool by South Korean policymakers to spur growth in manufacturing industries. What is more, overall growth rates of manufacturing industries appear significantly higher in the first time period. However, and as mentioned before, the second period was coined by the end of the HCI drive and a recession in 1980 which resulted from suppressed demand after the second oil crisis in 1979 (Lee et al., 2012). Therefore, it does not come as a surprise that industry growth rates in the manufacturing sectors experienced a sharp drop in comparison to the first period. Notwithstanding, the positive relationship holds in both periods and emerges even stronger in the latter. What cannot be derived from figure 10 is the impact of tax incentives on the process of inter-industrial upgrading.

In order to draw conclusions about the relationship between inter-industrial upgrading and tax incentives, further analysis of the data is necessary. The results are being shown in figure 11. Similar to the graphical evaluation of the tariff impact in figure 9, figure 11 portrays the relationship between tax incentives on the technology group level and value added growth rates. For this purpose, the respective averages of the manufacturing industries belonging to the four technology groups have been calculated. In contrast to figure 10, both periods have been merged, and tariff incentive rates for the decade between 1973 and 1982 have been

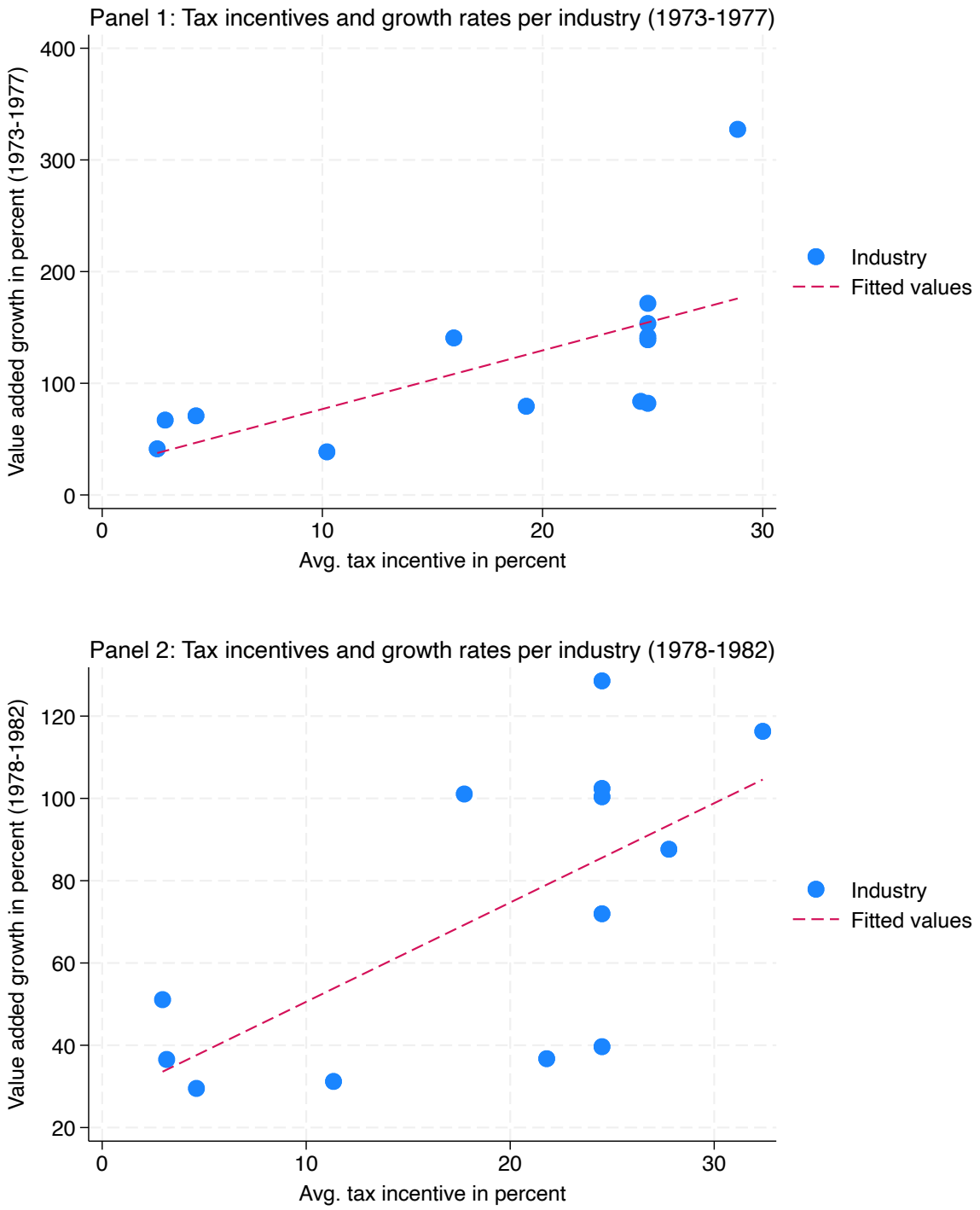


Figure 10: The relationship between tax incentives and growth per industry (1973-1982)
Source: own analysis, data from KOSIS (2025) and Lee (1996)

calculated by taking the respective arithmetic means for the entire period. Panel 1 of figure 11 shows the relationship between average tax incentives and industry groups' degree of technological sophistication, while panel 2 shows the relationship between value added growth and average tax incentives by technological manufacturing group. The observation labels in panel 2 indicate the technology ranking of manufacturing groups according to table 2. The

pattern observed from panel 1 shows a linear differential of tax incentives between industry technology groups. During the 1973-1982 period, tax incentives have been the lowest for low-technology manufacturing industries and highest for high-technology industry groups. This itself servers as evidence for the fact that the South Korean government designed IP in a way

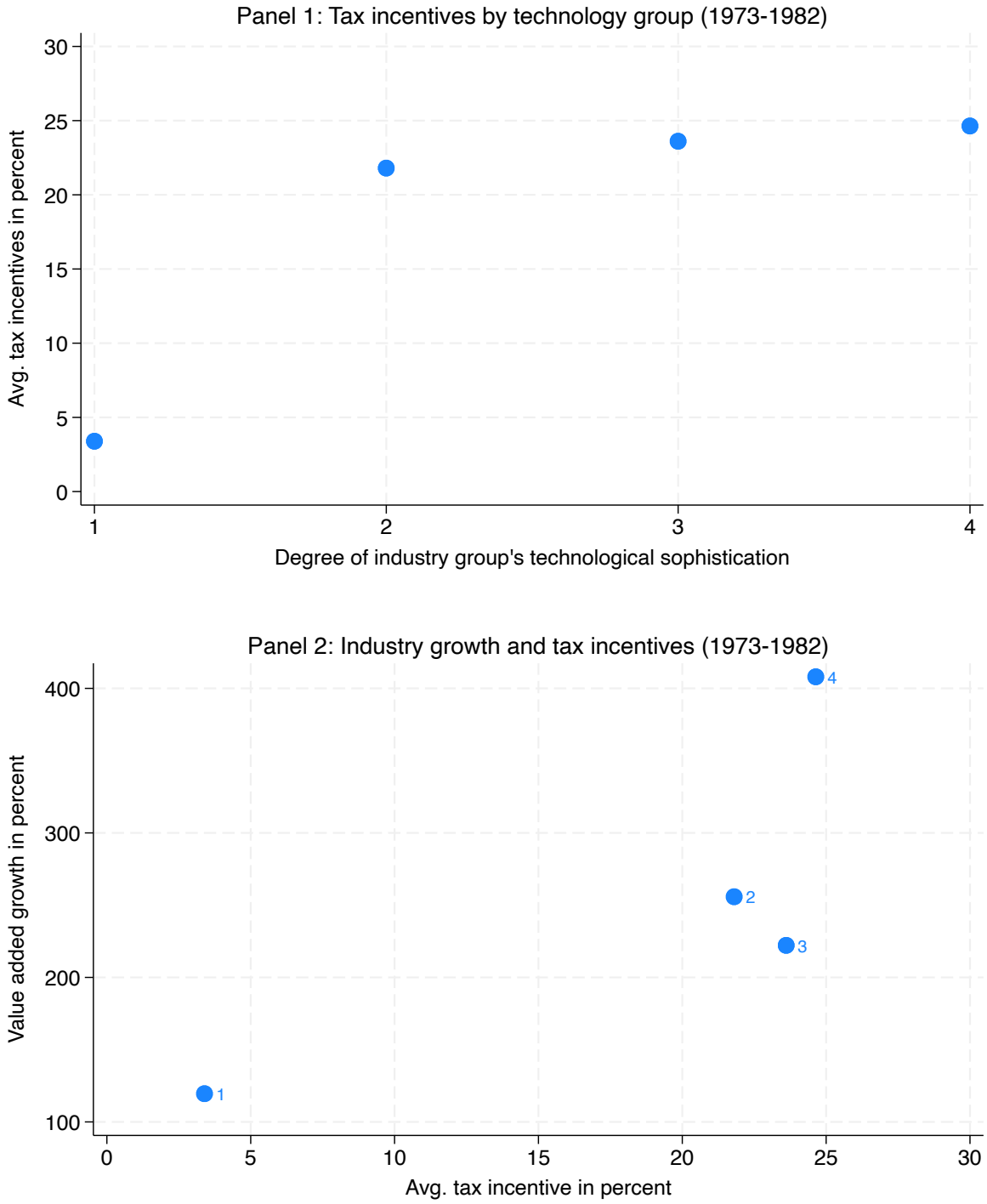


Figure 11: The relationship between tax incentives and growth by technological manufacturing group (1973-1982)
Source: own analysis, data from KOSIS (2025) and Lee (1996)

that was congruent with a sequential inter-industrial upgrading path from low-technology to high-technology sectors in the 1980s. At the same time, panel 2 offers insights about the effectiveness of this distortionary differential tax scheme. It shows that the industry groups with a higher degree of technological sophistication, and therefore with a more preferential tax treatment, enjoyed higher growth rates of value added over the observed timespan. Growth rates of medium-low-technology industries marginally exceeded growth rates of medium-high-technology industries despite the circumstance that tax incentives for the latter group were slightly more preferential than tax incentives for the former group. Nevertheless, the difference in both variables, tax incentives and growth rates, is negligible and therefore does not distort the generally observed pattern. Thus, the consistency of tax incentive policy design and realised economic outcomes which can be observed from figure 11 once again contributes to the broader notion that South Korea's targeted implementation of IP guided vertical inter-industrial upgrading according to a FG framework.

5.3 Findings

The analyses conducted in the preceding sections suggest two key takeaways. First, South Korea followed a sequential path of inter-industrial upgrading from low-technology to high-technology manufacturing sectors in the last third of the 20th century. Not only did manufacturing industries with a higher degree of technological sophistication grow significantly faster than industries producing less technologically complex outputs, but this pattern also resulted in a sequential upgrading pattern of technological industry groups. While South Korea's economic structure had been dominated by the production of low-technology outputs in the initial decades after the Korea war, this began to change in the 1980s when medium-low- and medium-high-technology industries grew rapidly and eventually surpassed output of low-technology industries after 1990. Additionally, the high-technology manufacturing group has recorded impressive growth rates over the entire period and is set to become the dominating industry group in the coming decades. Second, the IP employed by South Korean policymakers was highly congruent with a pattern of inter-industrial upgrading in a FG context. Differential tariff and tax schemes very likely contributed to the speed and structure of South Korea's inter-industrial upgrading process. While the analysis conducted in this paper does not permit any causal conclusions and does not capture the magnitude of the IP effects, the relationship between IP design and realised economic outcomes in the manufacturing sector strongly hints towards the notion that the inter-industrial upgrading

process followed, at least to some extent, the general guidelines set by the government's actively implemented policy framework. Industry protection through tariffs, as well as subsidisation in the form of tax incentives, both would have predicted the direction of South Korea's inter-industrial upgrading path *ex ante*. That is not to say that IP could or should be seen as the sole reason for South Korea's rapid economic transformation towards a technologically sophisticated manufacturing production structure, but rather suggests that IP can be effective in aiding vertical technological upgrading under certain circumstances.

6 Conclusion

This paper has investigated the relationship between government interventions in the form of IP and South Korea's impressive manufacturing transformation in the second half of the 20th century through the lens of the FG model. The analysis of South Korea's manufacturing sector from the 1970s through the mid-1990s clearly illustrates a sequential upgrading path from low- to high-technology industries. Crucially, the analysis has shown that South Korean policymakers employed industrial policy in the form of differential tariff and tax schemes in order to strategically support and accelerate this inter-industrial upgrading process. Manufacturing industries with a higher degree of technological sophistication benefitted from more preferential policy treatments, while they consistently experienced higher growth rates at the same time. This strongly aligns with the FG model of inter-industrial upgrading.

The implications of these findings are significant. This holds especially true for developing countries facing the dual pressure of increased competition through economic globalisation and vital domestic development needs. This paper highlights the importance of strategic government interventions, suggesting that carefully designed IPs can effectively contribute to progressive structural transformation. In contrast to the neoliberal Washington Consensus, which has long advocated for minimal government intervention and unconditional market liberalisation, the case of South Korea demonstrates how flexible and targeted IPs can effectively guide economic development. Strict adherence to neoliberal policies could hence come at the cost of denying developing economies the path towards rapid economic growth that has characterised the East Asian Miracle.

Recent shifts in global economic policy, most notably the tariff-led reindustrialisation strategy of the Trump administration confirm the relevance of the issue studied in this paper. However, it has to be said that aiming to reverse long-term trends of deindustrialisation and correct seemingly unfair trade imbalances risks undermining the very competitiveness it seeks to protect. As the South Korean development experience shows, effective IP involves far more

than protective trade barriers. It requires coherent long-term strategies that move in line with comparative advantages on global markets, rather than a mere insulation of inefficient sectors from global competition. In neglecting such insights, the US tariff policy risks damaging its economic structure by misallocating resources and decelerating innovation, thereby potentially exacerbating rather than reversing declining rates of economic growth.

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Appendix

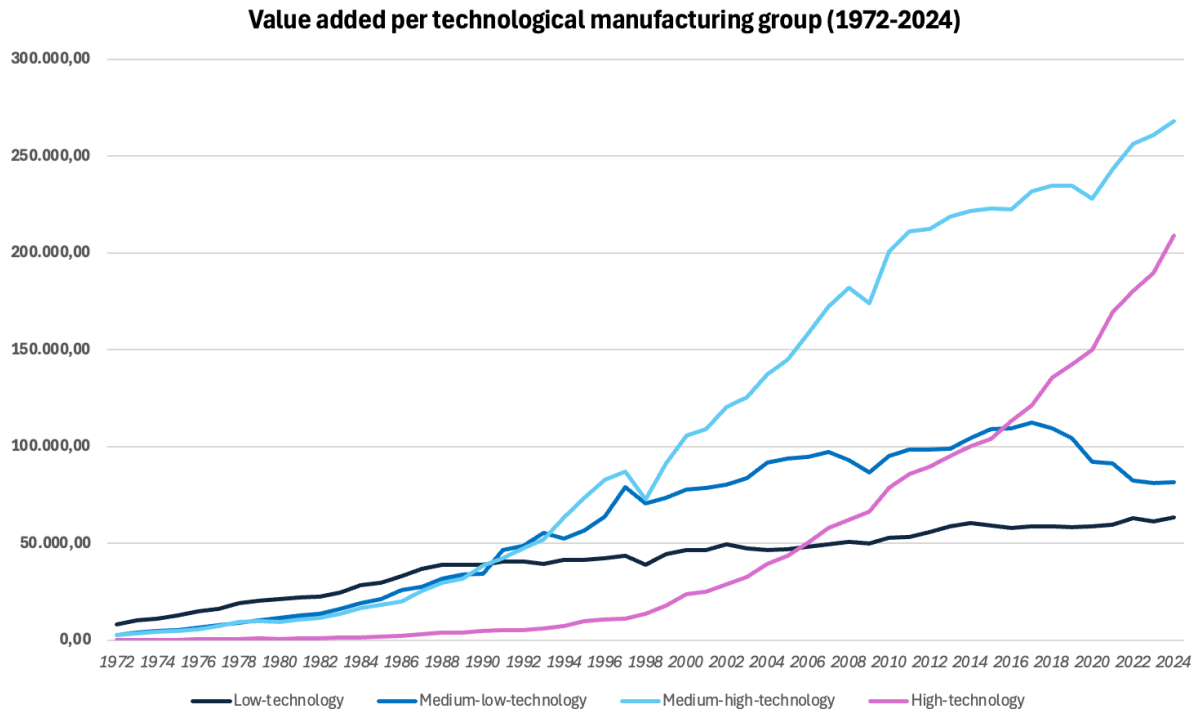


Figure A1: Value added per technological manufacturing group (1972-2024)
Source: own analysis, data from KOSIS (2025)

Sector[b]	1960–1962	1963–1967	1968–1972	1973–1977	1978–1982
Light industry:					
1–3	0.0034	0.0156	0.0772	0.0250	0.0296
4–9	0.0008	0.0200	0.1094	0.0426	0.0462
10–11	0.0048	0.0166	0.0968	0.0330	0.0320
12–13	0.0012	0.0104	0.0746	0.0242	0.0312
38	0.0162	0.0776	0.1670	0.0366	0.0382
Heavy and chemical industry:					
14–19	0.0594	0.1802	0.1064	0.2446	0.2778
20–22	0.0438	0.0246	0.0782	0.0308	0.0312
23–24	0.1058	0.2468	0.1060	0.2886	0.3238
25–37	0.0572	0.1362	0.0924	0.2478	0.2450

Figure A2: Tax incentive rates in the manufacturing industry
Source: Lee (1996, p. 395)

Code[a]	KSIC Code[b]	Industry Name
1	311, 312	Food
2	313	Beverages
3	314	Tobacco products
4	3211–3213	Fiber yarn, textile fabrics
5	3215	Fabric products
6	3214, 3216–3219	Other fabricated textiles
7	322	Wearing apparel
8	323	Leather and leather products
9	324	Footwear(leather)
10	331	Wood and cork
11	332	Furniture and fixtures
12	341	Paper and paper products
13	342	Printing and publishing
14	351	Industrial chemicals
15	352	Other chemicals
16	353	Petroleum refineries
17	354	Petroleum and coal products
18	355	Rubber products
19	356	Plastic products
20	361	Ceramics
21	362	Glass and glass products
22	369	Other nonmetal mineral products(cements)
23	371	Iron and steel
24	372	Nonferrous metal
25	381	Fabricated metal
26	3821, 38411	Power generating machinery
27	3822–3824	Metalworking and industrial machinery
28	3825–3826, 3829	Office and other general machinery
29	3831	Electrical industrial apparatus
30	3832, 3834	Electronic and communication equipment
31	3833	Household electrical appliances
32	3839	Other electrical equipment
33	3841 (−38411)	Shipbuilding and repairing
34	3842	Railroad vehicles
35	3843	Motor vehicles
36	3844–3845, 3849	Aircraft and other transport equipment
37	385	Measuring, medical and optical instruments
38	390	Miscellaneous manufacturing

Figure A3: Sector classification in the South Korean manufacturing industry
Source: Lee (1996, p. 405)

Statement on the use of AI-based tools

For this paper, I have relied on AI-based tools in the following instances:

1. Improvement of language in the abstract
2. Improvement of language in the conclusion
3. Transferring the tariff data from Yoo (1993) from source tables to Excel spreadsheets
4. Transferring the tax incentive data from Lee (1996) from source tables to Excel spreadsheets

Furthermore, all analysis, interpretation, and writing reflect my own original work.