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State Industrial Policy and Local Industrial Coalition: Evidence from the Pharmaceutical Industry in Incheon, South Korea

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State Industrial Policy and Local Industrial Coalition: Evidence from the Pharmaceutical industry in Incheon, South Korea

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The developmental state theory which has been the dominant concept in explaining East Asia's industrial development over the last three decades is largely based on the national level. It emphasises the role of central state bureaucrats and big businesses. We identify a missing piece of the puzzle in the political economy debate on industrial policy – namely, the linkage between national policy and local development politics. Compared to the central government, local government and subnational developmental strategies have received less scholarly attention while national development needs region-based resources and, thus, involves local-level societal interactions. This paper seeks to address questions such as: What interaction occurs between stakeholders at the local level, and how does it affect the central government's industrial policy? We do so by examining the local pharmaceutical coalition in Incheon, South Korea based on empirical evidence.

Today, a giant-scale pharmaceutical industrial cluster is operating in Incheon following roughly two decades of sectoral promotion by the Korean government. The present in-depth case study, however, unveils that the success has not only relied on the central state's plan. It is a result of interaction between the large Incheon-based pharmaceutical firms and the metropolitan government that shared mutual interests in global production and domestic competition over the central government's support. Also, big businesses led the coalition building by aligning local SME suppliers for efficient supply chains and political leverage towards their local government counterparts. The coalition eventually included non-business stakeholders such as research institutes, universities and even residential communities to support for the pharmaceutical industry to secure more local resources.

Key words: Regional development, industrial policy, coalition building, business power, local state-business relationship

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1. Introduction

Development discussion, advanced from the East Asian experience of rapid industrialisation, often puts the state at the centre of the discussion by focusing on its capacity to create and implement good industrial policy and relationships with industrial stakeholders, particularly big businesses. However, a growing number of cases show that development projects also begin at the sub-national level, namely, city and provincial districts, for example in the form of industrial clusters, production plants, export hubs, economic free zones, etc. Compared to the central government, subnational developmental strategies, for example, by the local government have received less scholarly attention. This is all the more surprising since national development needs region-based resources and, thus, involves local level societal interactions .

Reflecting on this less studied phenomenon and drawing on available literature, we attempt to unpack the "black box" of local politics and state-business relations that shape regional development and industrial promotion. We ask what type of interaction occur between stakeholders at the local level, and how do these in turn affect the central government's industrial policy. Taking a coalitional approach, we focuses on the local government-business relations underlying regional industrial policymaking.

We examine the local pharmaceutical coalition in Incheon, South Korea in order to identify the mechanism by which a new industry emerges locally and then expands to the national level. While acknowledging the usefulness of the state-centric view of the literature on developmental state and industrial policy in East Asia, the paper takes a different approach by directing attention to big business power that builds and leads industrial policy coalition to promote a certain industry in the district of question. This working paper thus primarily focuses on illuminating the role of big business in the process of shaping local industrial agenda and building a bio-pharma coalition in Incheon. Ultimately, though, our research aims to identify the operation of business elites' power in the coalition. The empirical evidence shows how the big Korean bio-pharmaceutical companies used different channels of influence on policymakers in Incheon who were interested in the industrial restructuring of the city.

The following sections revisit the coalitional approach to economic growth at the regional and national levels. Section 2 points out that the existing literature on industry and development does not sufficiently address the behaviour and influence of large corporations. Then, in Section 3, the concept of development coalition, or growth coalition, emphasising the partnership between state and business has grown in different contexts – advanced industrial democracies and East Asian developmental states. After providing an overview of the existing, largely
state(government)-centric literature, we propose to focus analytical attention on industrial policy coalition in the emergence of a new industry. The paper subsequently discusses why such coalitional analysis on industrial policy needs a more business-dependent approach and how our case study sought to address this. Then, the following section unpacks the findings from an in-depth case study in Incheon (Section 4), before it closes with discussions of the key findings and theoretical contributions (Section 5).

2. Big Business and Its Role in Subnational Industrial and Economic Development

The influence of large corporations, or 'big businesses', on industrial policy at subnational and municipal levels has been a focal point within several academic disciplines. Recognized for their substantial economic impact and political clout, these corporations are pivotal actors in forming regional and city-level industrial strategies. Piore and Sabel's seminal work (1984) underscores the catalytic role of large corporations in regional economic development. Piore and Sabel argued that big businesses drive job creation, wealth generation, and innovation in local economies, thereby indirectly shaping policy priorities and public investment preferences. This perspective has been corroborated by Zucker, Darby, and Brewer (1998), who found that regions hosting large corporations consistently exhibit increased innovation rates, heightened productivity, and enhanced economic growth.

Big businesses' influence extends beyond their direct economic contributions, for example by shaping the urban landscape and policy environment. Hall and Soskice (2001), in their study of 'varieties of capitalism', emphasized how large corporations

decisively impact city development, influencing key aspects such as infrastructure evolution and labour market characteristics. Glaeser, Kallal, Scheinkman, and Shleifer (1992) also looked into the role of big businesses in fostering 'agglomeration economies', wherein the concentration of industries in cities leads to increased productivity and economic growth. They found that big businesses play an essential role in attracting resources and talent to cities, thereby boosting their competitiveness.

The establishment and growth of industrial clusters, essential to regional economic development, is another arena where big businesses' influence is recognized. Porter's pioneering work (1998) proposes that large corporations often form the nucleus of industrial clusters, driving their development by drawing suppliers, skilled labour, and ancillary services to specific geographic regions. This activity, then, generates positive externalities, including knowledge spillovers, improved supply chain efficiencies, and heightened competitiveness. Expanding on Porter's work, Delgado, Porter, and Stern (2010) further scrutinized the dynamics of big businesses within industrial clusters. They found that large corporations often play a crucial role in initiating and sustaining the growth of industrial clusters, providing necessary resources such as capital and talent, and creating demand for local suppliers and service providers. Delgado, Porter, and Stern also emphasized the role of big businesses in enhancing cluster resilience, as their resources and capacities can help clusters adapt to economic shocks or industry changes.

In the literature on Global Value Chains (GVCs) and Global Production Networks (GPNs), big businesses or lead firms play a prominent role for subnational regional economy. The strategic decisions of these firms can significantly steer the development trajectory of cities and regions, shaping their economic, social, and physical landscapes. Gereffi, Humphrey, and Sturgeon (2005) argue that lead firms often control critical segments of the value chain such as design, production, logistics, and distribution. In the GPN framework, Henderson et al. (2002) contend that lead firms coordinate and manage a complex web of production and innovation activities across different geographical locations. Furthermore, Coe and Yeung (2015) posit that these firms can influence urban planning and infrastructure investments to align with their strategic interests. These investments can significantly shape the physical landscape of regional economies and enhance regions' attractiveness to

other businesses, workers, and residents, thereby stimulating local economic growth, employment creation, and urban development.

On the policy front, Markusen (1996) discussed how corporations' strategic decisions regarding production, R&D, and other activities can significantly influence regional economic development. These investment decisions often encourage local governments to develop policies that support the very sectors in which these businesses operate. Stiglitz (2012) also highlights the considerable influence of big businesses on local policy-making. Stiglitz suggests that these firms often use their significant resources and political clout to create policy environments that favour their interests. This may include lobbying for tax incentives, subsidies, and other forms of support, as well as pushing for deregulation or changes in labour policies that benefit their bottom line. Furthermore, big businesses can play a role in shaping workforce development policies, an essential component of industrial policy. As Autor et al. (2020) note more recently, big businesses often require a skilled workforce to support their operations. This need, in turn, can stimulate local governments to invest in education and training programs that align with the needs of these businesses.

Despite the extensive literature, we argue that there remains a significant research gap in understanding the behaviours of big businesses in channelling their interests into industrial agendas and policy making processes of local governments. Additionally, the nuanced interactions between big businesses and other actors in building and strengthening industrial clusters have not been thoroughly explored in emerging industrial cities. This paper seeks to probe this dynamic from a coalition perspective. Particular emphasis is given to an industrial policy coalition, spearheaded by local government and business entities, that fosters a specific industry within the regional economy.

3. Industrial Policy Coalition

The coalitional approach to state-business relations has developed mainly with the concept of growth coalition, or development coalition. However, sharing the focus on the close partnership between government and business actors, the concept

developed into two streams of literature at different scopes of development and main stakeholders.

Growth Coalition: State-Business Partnership in Different Contexts

The first stream pertains to growth coalition for sub-national development in the context of advanced capitalist democracy; the second to growth coalition for national economic development in the context of developing countries, especially the developmental success in East Asia. In contrast to the focus on the local level of development performance in the first group of the growth coalition literature, the developmental state literature puts emphasis on the macroeconomic outcomes of effective state-business relations.

The first and initial adoption of the concept of growth coalition emerged from the context of local economic development in advanced industrial democracies, including the US, UK, and EU, to depict the increasing partnerships between local governments and businesses since the late 20th century. In the rapidly liberalising and decentralising politics and economy, local governments began to seek their own ways to boost the local economy. A growth coalition refers to a group of powerful individuals and organisations located in a particular region or city who come together to promote economic growth and development. Such coalition typically includes business leaders, regional politicians, real estate developers, and other stakeholders with a vested interest in the success of the local economy. They act together to mobilise resources dispersed among the stakeholders for their common enterprises and jointly represent policy agendas related to economic interests (Mossberger and Stoker, 2001). The goal of a development coalition is to work together to attract investment, create jobs, and spur economic growth in the region.

Private business with capital power is the source of local investment and job creation. The local and central government even encourages the involvement of private businesses in local economic development. With the growth coalition at the centre, cities operate like a "growth machine" for urbanisation and an initial industrial expansion (Molotch, 1976). The engine of this growth machine is land among other local assets. Local property businesses and investors gain (or lose) the most from the local government's decision on land use and zoning. Local government, in this sense, acts as a property agency. Relevant business service

providers and business owners who indirectly benefit from the overall local growth are also part of the growth coalition (Lloyd & Newlands, 1988; Molotch, 1976).

The second literature stream grew from the context of developmental states. The coalition's main goal is to work collaboratively to identify and pursue development strategies that address the unique challenges facing the country. Such strategies might include economic growth and structural formation through industrialisation by implementing policies and initiatives that support entrepreneurship, job creation, and investment. Thus, the target of development strategies is at increasing/diversifying the production and exports in the economy. Whereas land development takes a big part at the national level growth, industrial policy is at the heart of the development coalition in South Korea, Taiwan, and Singapore. Growth coalition in developing countries work with limited budgets and resources to achieve their goals. Promoting public-private partnerships that bring together government agencies and private firms becomes a prerequisite to overcoming these challenges. This allows them to leverage their collective resources and expertise to promote economic growth and development (Bräutigam et al., 2002; Sen, 2015).

The studies on the development of South Korea find that the state equipped with technocrats and institutional capacities played a critical role in establishing and implementing industrial policy (Amsden, 1989; Nem Singh & Ovadia, 2018). Firms, big businesses, in particular, were the most important partner to carry out the policy through new investment and production. Despite criticism of the cronyism between the Korean state and big business (Kang, 2002), close and frequent consultations with business associations enabled the government policymakers to access market information and practical needs in the field of production and export, while maintaining the state autonomy to design policy. Also, such coalitional communication reduces the political and economic uncertainty for firms in deciding the investment (Evans, 1995, 12; Haggard et al., 1992; Lemma & Velde, 2017, 71).

Big Business in the Making of Industrial Policy Coalition

The existing research approaches to development coalitions or growth coalitions provide a good starting point for understanding regional industrial development and policy. However, these approaches have several limitations. In the literature on developmental states, the discussion about development coalitions needs greater focus on bottom-up policymaking. This approach involves industrial promotion

strategies that originated at the local level and then expanded to the national level. On the other hand, the important variable of the local development is not necessarily land as we witness many multi-national companies exercise greenfield investments in cities for actual production and exports. By combining the two approaches to growth coalitions, one can start thinking about how to understand the local level of industrial policy that targets the production in a certain industry serves as the growth engine and expand the size of the industrial support to the national level.

Furthermore, the development coalition literature, both at the local and national level, has been too state-centric in its approach. This means that it focuses too heavily on the role of the central and local government in development and neglects the contributions and interests of other actors. Such a biased focus overlooks the fact that many development projects involve multiple stakeholders with diverse interests and capacities. The state is not the only actor that can drive development, and other actors must also be included in the analysis and planning of development initiatives. Among others, big businesses need more spotlight to understand the modern policy process because they are the most important partner in the process of formulating and exercising industrial policy.

In other words, the development coalition literature often overlooks the relative power dynamics between the state and business in the formulation of mutual interests. Considering the mutual interest is already set by the government, the existing literature tends to overemphasise the capacity of the government to lead development initiatives, thereby neglecting the role and power of the private sector in shaping the industrial agenda. The literature tends to treat businesses as mere implementers of development policies rather than active and influential players in building industrial policy coalition. This, in the end, leads to a neglect of the fact that businesses often shape the industrial agenda through their investments, lobbying efforts, and strategic partnerships.

This paper proposes a new perspective to comprehend the industrial policy and development process, specifically through the lens of an "industrial policy coalition". We argue that industrial policy coalition is a collaborative endeavour that brings together the key stakeholders – the government and big businesses – and other assistive actors to formulate and implement strategies for industrial development. The goal of such a coalition is to boost productive sectors within a specific country or

region. Accordingly, unlike traditional approaches, the concept of an industrial policy coalition is not confined to a state-centric view. Instead, it acknowledges the significant role and influence of large businesses in shaping and propelling development initiatives. In this context, businesses are not just policy implementers but active contributors that utilize their investments, lobbying efforts, and strategic partnerships to influence the industrial agenda right from the initial phases of development. The literature on development coalitions tends to overlook the mutual interests and power dynamics between the government and businesses during coalition formation. By focusing on these elements, the industrial policy coalition approach allows for a comprehensive understanding of agenda setting and policy formation in particular in the process of industrial policy.

Case Study: Incheon Bio-pharma Case

This working paper examines the interplay among local actors during the subnational industrial policymaking and its impact on shaping national policy. It investigates this issue through an empirical case study of the local pharmaceutical coalition in Incheon, South Korea based on empirical evidence. Incheon has developed a bio-pharmaceutical policy focused on attracting investment, creating jobs, and fostering innovation in the local economy. The stakeholders involved include local government, biotech companies and business associations, local interest groups such as universities and resident's associations, local research institutes and public agencies, as well as the central government.

Among others, the business's role at the local level proved crucial in the formulation of Incheon's bio-pharmaceutical policy, not only for its implementation. Represented by the two big players – Samsung Biologics and Celltrion, biotech companies were expected to invest in production facilities, conducting research and development, creating jobs and, by doing so, contributing to the growth in Incheon as the primary investors themselves. The Incheon government's role was to provide a favourable business environment, including tax incentives, regulatory support, land use, and infrastructure development such as human resources. There is also a group of broader stakeholders who expected positive impacts on the local economy and society from establishing the new industry in the district. As a result, Samsung Bio meanwhile has built its fourth factory in the district in 2022 since manufacturing started in 2012.

The Incheon pharmaceutical coalition demonstrates an effective orchestration between the municipality and business actors which also pushed the policy force bottom-up from the local to the central industrial agenda. In the process, the bio-pharma companies actively led the conversation with the government of the Incheon Metropolitan City to shape the city's policy direction. The case study in the following sections closely examines the business role in building the bio-pharmaceutical policy coalition in Incheon based on several sources, including local government documents and interviews with local technocrats and business actors. The local government documents we examined include reports on economic policies, trade regulations, and investment incentives. We also conducted preliminary interviews with key players in the local business community, including former and current business people and local government officials.

4. The Bio-pharmaceutical Industry in Incheon, South Korea

The bio-pharmaceutical industry in Incheon

Incheon is a metropolitan city located on the middle western coast of the Korean Peninsula. The city has long served as the main gateway between the world economy and the national economy as it has the country's largest airport and the second largest seaport. These geographical features of Incheon are a great advantage for bio-pharmaceutical firms whose products are transported via aviation logistics. The Incheon Metropolitan government designated biotech as one of the city economy's strategic industries in 2004. However, this announcement was largely inessential in the 2000s when the city economy was dominated by some traditional manufacturing sectors such as automobile, machinery, petrochemicals, and electronics. Moreover, the central government has intensively supported two other regions to establish biotech industrial clusters in Osong and Wonju respectively, specialising in healthcare devices and pharmaceuticals, while paying little attention to Incheon, at least until the mid-2010s.

The private sector, especially big bio-pharmaceutical firms, is the main protagonist in leading the biotech industry's dramatic development in Incheon. The lead settler was Celltrion that is the first in South Korea to be qualified for the international standard of Good Manufacturing Practice (cGMP) set by the US Food and Drug Administration. Celltrion built a 50,000-litre mammalian cell culture facility in 2005 in Incheon. It is reported that, as of 2005, Celltrion's

production capacity ranked third in the world for protein therapeutic production (interview). The second, and bigger, investor was Samsung Biologics. Samsung Biologics as a contract manufacturing organisation established its production facility specialised in biosimilar products in 2011. In the following year, Dong-A Pharm, one of the leading traditional pharmaceutical firms in South Korea, broke ground for a production facility in Incheon as well. Foreign biotech firms like Janssen, GE Healthcare and Merck have also continuously invested in Incheon during the 2010s. Recently, during the Covid-19 pandemic period, two more Korean giant pharmaceutical firms, SK Bioscience and Lotte Biologics decided to establish their headquarters and factories in Incheon as well. All these investments have been concentrated in Songdo, the southwest area of Incheon, forming the Songdo biotech cluster. In consequence, Incheon has the world's largest bio-pharmaceutical production capacity of 880,000 litres for a single city.

Figure 1 The location of Songdo, Incheon Metropolitan City
Source: The Incheon Institute (2019) The Industrial Promotion Platform in Incheon Free Economic Zone.

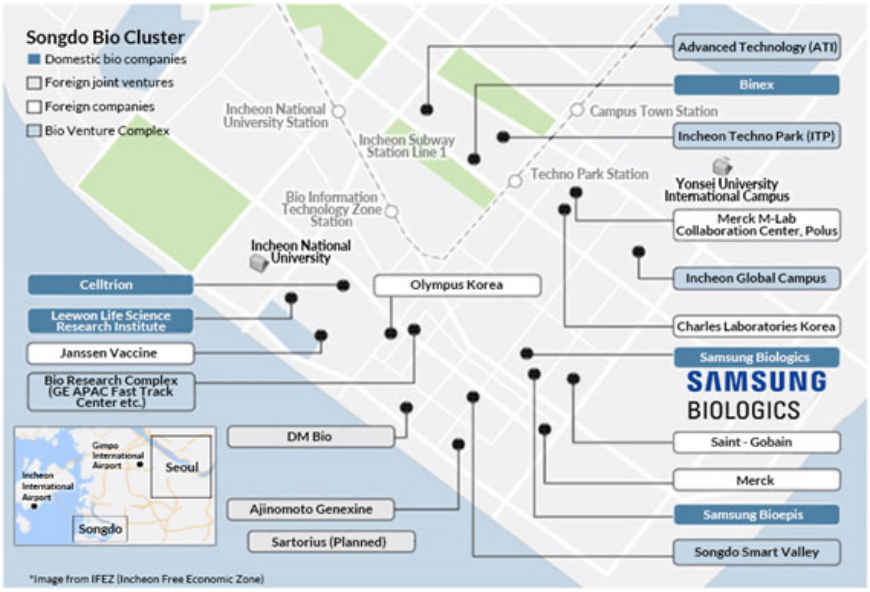

Figure 2 Map of the Songdo Bio Cluster
Source: Figure 3. from Lim, K. (2020) Beyond Covid-19: How Localization Can Help Strengthen Supply Chain Capabilities. Samsung Biologics.

These big pharmaceutical firms have played a pivotal role in this clustering of biotech firms and institutions in Songdo. The number of pharmaceutical firms located in Incheon has increased from 23 in 2011 to 53 in 2020, while the number of employees has almost quintupled during the same period as shown in Table 1 below. The production volume of the Incheon-based pharmaceutical industry has grown by 564.5% from 682,311 million KRW in 2011 to 3,854,024 million KRW. It is noticeable that most of the production is for export rather than domestic sales.

Table 1. The number of firms and employees in the pharmaceutical industry in Incheon

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Firms	23	25	30	34	36	37	42	52	50	53
Employees	1,412	1,739	2,338	2,778	2,896	4,041	4,231	5,560	6,259	6,796

Source: Author modified data from Korea Statistical Information Service

These figures imply that big businesses have invested heavily in their cluster area. The R&D investment expenses by the pharmaceutical firms located in Incheon have been maintained at least more than 200 billion KRW every year between 2014 and 2021. As for the facility investment expenses, although the investment volume has decreased from 228,994 million KRW in 2015 to 160,406 million KRW in 2020, the figure marked the highest record of 342,149 million KRW in 2021. The facility investment cost is expected to increase in the future

as the major pharmaceutical manufacturers are scheduled to expand their factories on a large scale.

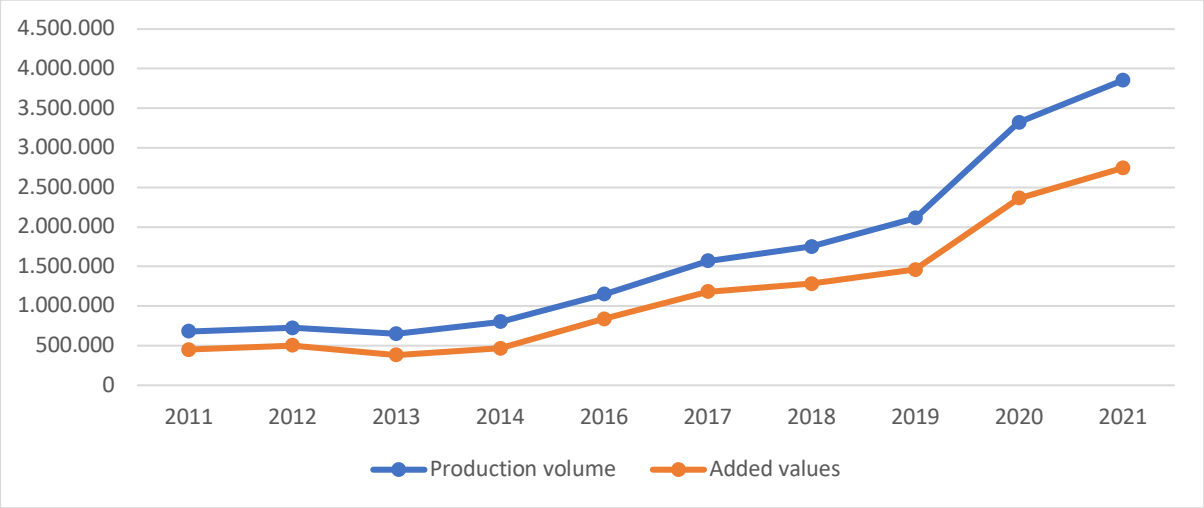

Figure 3. The trend of production and added values in the pharmaceutical industry in Incheon
Source: Authors modified data from Korea Statistical Information Service

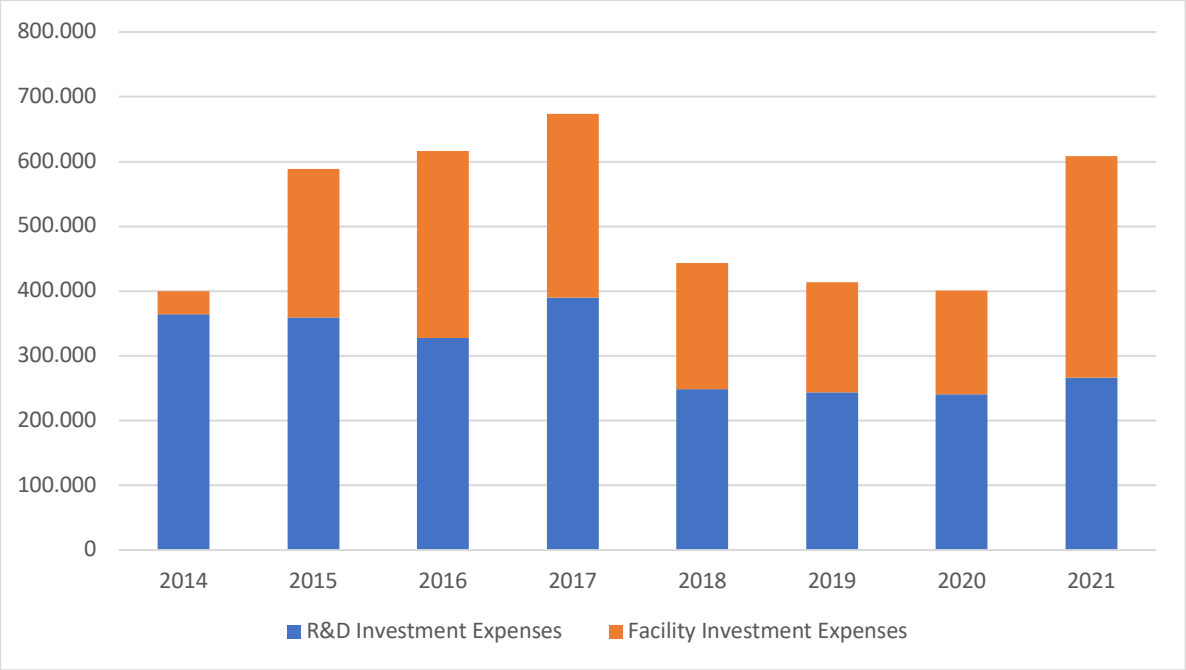

Figure 4. Investment in the biotech industry in Incheon
Source: Authors modified data from Annual Report on Survey of Domestic Bioindustry published by Korea Biotechnology Industry Organisation

Business initiative in the bio-pharma cluster in Songdo, Incheon

Incheon's bio-industry plan has gradually evolved following the business interests of companies like Samsung and Celltrion, rather than the city's original intention. In 1994, the landfill of Songdo 4th Industrial Complex began, dreaming of "Korea's Silicon Valley". However, Incheon's original plan for Songdo was not focused on the bio-industry. The city was more interested in attracting venture businesses related to information and communication technology (ICT). As part of the plan, the city announced to create of a biotech venture complex in the Incheon Technopark, composed of a biotech venture support centre, biotech venture building, and biotech industry technology centre in 2000 (Kyungin Daily, June 18, 2000). Nevertheless, this approach was taken from the perspective of fostering information and communication technology ventures, and there was not much interest in promoting bio-pharmaceutical production.

The interest in biopharmaceutical production in Incheon was sparked by the entry of Celltrion in Songdo in 2001. After almost 8 months of preparation, VaxGen, a U.S. pharmaceutical company, decided to invest in production on a 99,174m^2 factory site in Songdo new city through its domestic agent Nexol Biotech, the predecessor of Celltrion. Incheon City agreed to lease the land for a ten year rent-free period and sell it afterwards. In February 2002, Nexol's CEO Seo Jung-jin established Celltrion, and in March 2003, the groundbreaking ceremony for Celltrion's first plant and R&D centre took place. As mentioned above, in 2004 the Incheon government adopted a new industry policy, also encompassing the biotech-sector. However, at that time, the biotech industrial policy was only a fictional blueprint, relying on the construction of Celltrion's production facility (interview with a business support officer).

Our interview with a former policy consultant who was involved in designing the early industrial strategy for the biotech industry in Incheon also confirmed that the announcement made by the local government was not an industrial policy with the intention of achieving some grand vision related to the biopharmaceutical industry. Only in 2006, the Incheon Institute, the city's development research institute, published its first report on the development of the biotech industry in the Incheon area, and the first domestic biotech event, Bio Korea 2006, was held in Songdo. The formation of Incheon's bio-industrial complex began in earnest when Samsung made a serious entry into the bio-industry between 2010 and 2011. The immaturity of the bio-pharmaceutical industry in Incheon before that date also appears to be due to the fact

that Incheon was disqualified from the advanced medical complex designation competition in 2009 by the central government.

Samsung had an early interest in the biotech business and appealed for investment in Incheon. In November 1999, Samsung planned to make biotech (life science) its next-generation new business, forming a consortium with Samsung Fine Chemicals, Samsung Advanced Institute of Technology, Samsung Medical Center Life Science Research Institute, and Sungkyunkwan University School of Pharmacy. In 2000, Samsung decided to consolidate its scattered bio-business within the group, establish Samsung Biotech, and invest 2 trillion KRW by 2005. In July 2002, Samsung submitted a plan to invest 359 trillion KRW in Incheon over 28 years, which also included a plan to establish a bio-industry complex in Cheongna and an Information and Communication Technology (ICT) complex in Songdo. However, in the early 2000s, it was difficult for Samsung to fully engage in the biopharmaceutical and biotech businesses due to various internal and external factors, such as the regulation of conglomerates' investments in the metropolitan area under the slogan of national balanced development, the limitations of the biopharmaceutical industry which did not bring quick returns compared to long-term investments, and corporate restructuring after the Asian financial crisis. In 2007, Samsung's then Chairman Lee Kun-hee directed the exploration of new growth engines, leading to the launch of a new business team in August 2008, which proposed biotech as a future growth engine for the group. In 2010, Samsung announced five new businesses, including biotech again, after about three years of initial business development since 2008.

In 2011, Incheon City and Samsung signed an "investment agreement for the construction of a biopharmaceutical production plant and research facilities," and the city agreed to lease 224,000 square meters to Samsung for 50 years rent-free. Samsung Biologics was established in April as a joint venture between Everland, Samsung Electronics, and American Quintiles, aiming for CMO production. Soon, Samsung Biologics began construction of its first plant in Songdo, followed by Celltrion's completion of its second plant in October. Samsung's biopharmaceutical company soon afterwards signed a supply contract with BMS in 2013 and begin full-scale production. The biopharmaceutical industrial complex in Songdo has since expanded and grown to the extent that the municipality hosted a global conference in 2016 (the 2016 Bio+ Incheon Global Conference) in Songdo.

Incheon City has subsequently continued to expand its bio cluster. Between 2017 and 2020, Incheon City decided to expand its bio cluster to a scale of 984,000 square meters in the 11th

district in Songdo. Samsung Biologics already purchased 357,000 square meters for its second bio campus. In November 2020, Samsung Biologics began construction of its fourth plant. As of 2023, the biopharmaceutical industrial park in Songdo is comprised of a 1,015,000 square meter area, including the 4th, 5th, and 7th districts. Celltrion is planning to start construction of its third plant within the year, and Samsung Biologics is expected to complete its fourth plant.

In conclusion, Incheon City's bio-industry plan has evolved significantly since its inception. The city's initial focus on ICT shifted towards biopharmaceuticals, largely due to the business interests of companies like Samsung and Celltrion. These companies have been instrumental in shaping the development of the bio-pharmaceutical industrial park in Songdo, which is now a thriving hub for biotechnology and pharmaceutical companies. However, the role of companies in regional industrial policy and development goes beyond simple initial investment and cooperation between companies and local governments. Companies take the lead in attracting central government support for the local bio-industry and including other actors in the industry coalition. The following sections illuminate such business roles in more detail.

Figure 5 Expansion of the Songdo Bio Cluster (Plan)
Source: Invest Korea (2021) Location Report: Songdo Bio Cluster, the Future of K-Bio.

The central government's support for the Songdo bio cluster: K-NIBRT

As described before, the central government did not put priority on fostering the Incheon-based biotech industry until the mid-2010s. This was the case because the South Korean government adheres to the principle of balanced regional development, given that the development disparity between socio-economic disparity between the capital region including Incheon and the other regions has widened. Thus, although the Incheon Metropolitan government designated the biotech industry as one of the city's future strategic industries in 2004, the biotech industry located in Incheon has remained beyond the umbrella of the central government's industrial policy. The disobliging attitude of the central government to Incheon has significantly changed between the late 2010s and the early 2020s, launching three successive projects to support the biotech industry located in Incheon beginning from Korea National Institute for Bioprocessing Research and Training (K-NIBRT) to K-Bio Lab Hub, and Global Vaccine Hub. This section focuses on the first project that the local government acquired support from the central government in the biopharma industry.

K-NIBRT is a national institute to provide vocational training programmes specialised in bioprocessing. As one would recognise with its abbreviation, this South Korean training centre set as its benchmark NIBRT in Dublin, the famous Irish bioprocessing research and training institute. The Ministry of Health and Welfare (MOHW), the Ministry of Trade, Industry and Energy (MOTIE), and the Incheon Metropolitan government jointly invested in establishing K-NIBRT. The institute is located within the global campus of Yonsei University in Songdo. Its pilot training programmes, which are jointly operated by Yonsei University and Incheon Technopark, have turned out its first 210 trainees in 2022. It is very meaningful for the Incheon-based biotech firms in that human resources and skilled labour pool are secured near their production facilities. In terms of industrial policy, establishing K-NIBRT in Incheon proves an exceptional case in the central government's policy decision which has adhered to the principle of balanced development and preferential support for the non-capital regions.

In the background of Incheon's winning of the bid, Samsung Biologics initiated the policy idea to the Ministry of Trade and Industry already in 2016. According to an interview with the researcher who conducted the case study on Irish NIBRT for the Incheon metropolitan government, Samsung Biologics was sending their employees to NIBRT in Dublin for expert training after its establishment. Due to its late entry into the industry, Samsung Biologics was suffering from a shortage of human capital relatively more severe than Celltrion was. While

there has been a call for fostering bioengineers since the early 2000s, it did not lead to a meaningful policy measurement by the central government. The sudden increase of production in the bio-pharmaceutical sector caused competition among the big firms, raising concerns about the brain drain in the bio start-ups and venture companies. In addition, Samsung Biologics has not been satisfied with the quality of the human resource pool in the country as it aims at cutting-edge technologies in the global market. MOTIE, jointly with MOHW, announced the government plan to establish the K-NIBRT and called for a public competition among consortiums of a local government, (local) government agency, and a university.

Incheon's application to the grand competition was particularly against Osong backed by LG Chem, another new big player. Incheon's bio firms, business associations and research institutes aligned together to support the city's winning in the competition. Local and external universities were also encouraged in joining the consortium with the Incheon government and the Incheon Technopark. The lot was taken by Yonsei University with a promise to establish a university hospital adjacent to its Songdo campus. Samsung Biologics and Celltrion also assisted the city's attraction of the training centre by releasing their plans for production investment and collaboration with K-NIBRT. The central government designated Incheon as the region that will embrace the bioprocessing research and training institute in October 2020. K-NIBRT brought the full attention of the central government to Incheon as an industrial base to promote the bio-pharma industry.

Corporate lead in establishing bio-pharma supply chain and localisation of raw materials

In 2015, with the full operation of production facilities by Celltrion and Samsung Biologics, there was a demand for sourcing raw materials locally. Bio-pharmaceutical companies located in Songdo suggested that domestic sourcing of raw materials could lead to cost savings and promote collaboration with local small and medium-sized enterprises. This suggestion was made through various channels such as conferences, news media, policy advisory, and public-private partnerships with the Incheon Metropolitan City, the Incheon Free Economic Zone (IFEZ), the Incheon Techno Park, the Incheon Institute, etc. As a result, the idea of a raw material procurement supply chain for bio-pharmaceutical companies was seen as necessary for regional economic revitalization. In 2017, Incheon Techno Park established a plan to build a bio-industry technology complex in Songdo 11 to foster raw material supply companies. The Incheon Free Economic Zone also announced a plan to create a bio-pharmaceutical

cluster in zone 11 in order to promote domestic sourcing of raw materials and foster biotech companies.

Samsung Biologics initiated private-led investment to build a raw material supply chain in Songdo along with the beginning of its production. As a result, the German company Merck KGaA announced its plan to build a raw material supply centre in Songdo in 2016, followed by the investment of the French company Saint-Gobain in 2017 and a supply contract with Samsung Biologics in 2018. On the other hand, Samsung Biologics also executed a project for domestic sourcing of raw materials with local suppliers such as Biocox in 2018. At the same time, the Incheon Chamber of Commerce and Industry raised awareness of the necessity to establish a bio raw material supply chain through the Incheon Strategic Industry Forum and supported Samsung's efforts to establish a local supply chain. In 2019, Celltrion, as part of 'Celltrion Group Vision 2030' with a scale of 40 trillion KRW, promised to take responsibility as an anchor company that promotes collaborative growth and mutual benefit through the creation of an industrial valley based on the localization of raw materials and open innovation.

In December 2019, Samsung's initiative to establish a local bio-pharmaceutical supply chain finally resulted in a business agreement between nine institutions and companies (Incheon City, Incheon Chamber of Commerce and Industry, Incheon Techno Park, Korea Bio Industry Association, Korea Biopharmaceuticals Association, Celltrion, Samsung Biologics, Biocox, and STJEN Bio), marking the first attempt in the country to localise the production of materials, parts, and equipment for the bio industry. In 2020, the Incheon Chamber of Commerce and Industry released the results of a survey of corporate opinions on the localization of raw materials for the bio-industry. Based on this, Incheon City, Incheon Free Economic Zone (IFEZ) Authority, and the Incheon Chamber of Commerce and Industry established a plan for domestic sourcing of raw materials for the bio-industry in 2021, and the city government allocated a budget of KRW 300 million for consultation support for domestic sourcing of raw materials in 2021 and 2022. IFEZ Authority operated special exhibition halls for the supply chain of raw materials at conferences and industrial exhibitions in the bio-health sector. In addition, the city was selected for the MOTIE's public project to support the commercialization of raw materials for bio-pharmaceuticals, securing KRW 5 billion in national funding.

5. Discussion and Conclusion

The present paper is a work in progress. Therefore, it does not provide a comprehensive view on either Industrial policy coalitions or the Incheon bio-pharmaceutical cluster. However, we argue, that is is suggestive ofthe role of big business in the local industrial policy and development, also the local bio-pharma coalition. The evolution of Incheon's bio-industry plan reflects a complex interplay between corporate interests, local government initiatives, and federal support. It is a compelling narrative of how business interests can shape regional industrial policy and development, exemplified by the profound influence of Samsung Biologics and Celltrion.

Firstly, these businesses have been instrumental in initiating Incheon's transition into a hub for the bio-pharma industry. Despite the city's initial interest in fostering ventures related to information and communication technology (ICT), the entrance of Samsung and Celltrion redirected Incheon's focus towards biopharmaceuticals. Their substantial investments and continuous commitment to the city were pivotal in catalyzing the growth of Songdo's bio-pharmaceutical industrial park, now a thriving biotech and pharma hub.

Secondly, Samsung Biologics played a critical role in securing central government support for the biotech industry in Incheon. The establishment of the Korea National Institute for Bioprocessing Research and Training (K-NIBRT) represented a significant policy shift, breaking away from the central government's principle of balanced regional development. Initiated by Samsung Biologics, this marked a turning point for the city, leading to the approval of additional projects that further boosted the local biotech industry.

Lastly, both Samsung Biologics and Celltrion spearheaded the creation and development of the local bio-pharma supply chain. This, in turn, encouraged Incheon to support these efforts through policy initiatives, thereby promoting regional economic revitalization and domestic sourcing of raw materials. These companies not only advocated for the establishment of a raw material procurement supply chain but also actively initiated investment and collaborations to realize this vision.

In summary, the story of Incheon's bio-industry plan illustrates the business role that shaped regional industrial policies and development. Their influence extends beyond the initial investment, marking them as key drivers of industry growth and innovation. The case of Samsung Biologics and Celltrion underscores the potential of such a corporate-government collaboration in fostering robust and sustainable industrial ecosystems. Finally, the bio-pharma coalition has expanded to other local stakeholders, including local economic agencies, research institutes, and universities. Further research will need to investigate, among other things, the business elites' approach to the actors in the local government so that we are able to draw up a more complete picture of big business-led coalition building for the bio-pharma industry in Incheon.

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