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Explaining the Path Dependency of Smart City Policy in South Korea: An Evolutionist Interpretation

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ABSTRACT: This paper contributes to understanding of international variations in smart city practices by examining the role of institutional inertia and inter-organisational policy mobility. In formulating smart city policies, South Korean bureaucrats adhere more closely to the traditional Korean industrial policy model than to smart city concepts prevalent in global academia or Western policy circles. This Korean model—often referred to as developmentalist industrial policy—epitomises the state's leading role in economic development. It was one of the main drivers of South Korea's rapid economic growth in the 1970s and 1980s. The model has become less effective in recent decades because the growth of the private sector has surpassed the state's capacity to provide incentives and coordination. Nonetheless, the lingering memory of past successes continues to influence public opinion and political leaders' decision-making, leading bureaucrats to shape their own agenda in the form of developmentalist industrial policy. We argue that this tendency is why South Korean smart city policies has become for the most part industrial policies rather than improvements to urban public services, as observed in Western Europe and North America.

KEY WORDS: South Korea, Smart City Policy, Path Dependency of Public Policy, Institutional Inertia, Diversity in Smart City Practices

Introduction

It has been established that intercontinental differences exist in understanding and implementing the smart city concept. In North America, where the smart city concept proliferated beyond a small circle of experts before it did in other continents, IBM and other ICT firms leveraged it to penetrate and expand the public procurement market. Western European initiatives feature government-initiated small-scale projects to improve public administration and services. Middle Eastern implementations incorporate smart technology to enhance prestige of their monumental new towns. In East Asia, the central government has been pushing for smart cities for technological advancement and economic growth. The goal of this study is to contribute to understanding the causes of these variations.

These variations are partly related to the distinct historical trajectories of the states, which

many conceptualise as the “path dependency” of public policy. “Path dependency” is a useful term in describing the situation where past decisions and events influence or even determine today’s actions. However, this descriptive term does not elucidate the micro-level mechanisms through which past events influence present actions. To address this issue, this study focuses on the role of civil servants in creating inertia in state policies. More specifically, we trace the evolution of South Korea’s smart city policies from 2008 to 2022, demonstrating how civil servants in the Ministry of Land, Infrastructure, and Transport (MOLIT) have utilised the smart city concept to serve the ministry’s own interest. Theoretically, we integrate insights from public choice theory (Buchanan and Tullock, 1962) and evolutionary economics (Nelson and Winter, 1982). Our view aligns with public choice theorists by positing that bureaucrats act mainly in their self-interest rather than the state’s and public interests. However, we depart from public choice theorists’ assumption that bureaucrats (and actors in general) choose the most efficient means of achieving their interests. Instead, we adopt a more realistic perspective that civil servants tend to rely on a limited number of established ways of doing things that evolutionary economists would call work routine.

The data for this study were obtained from three sources. First, the authors participated in and observed the planning of two export-oriented smart city policies of South Korea, providing an insider perspective on the real objectives of the policies and bureaucratic dynamics involved. Second, in-depth interviews were conducted with nine key stakeholders directly engaged in South Korea’s smart city policy, including academics, public think tank researchers, civil servants, and private sector actors. Finally, we analyzed key policy documents from the South Korean government and affiliated think tanks, all of which are publicly available. In addition to these main sources, newspaper articles and websites of pertinent organisations were referenced to corroborate the basic facts.

Diversity in smart city practices

Smart city discourses gained prominence in the early 2000s (Lara et al., 2016), with global interest accelerating rapidly since the 2010s. This growth can be attributed to increasingly affordable, reliable, and advanced technologies, alongside enhanced big data capabilities (Batty, 2013). Nevertheless, despite widespread adoption, no universally agreed definition of a “smart city” currently exists (Angelidou, 2017; Hollands, 2008; Yigitcanlar et al., 2019). While typically framed as technology-driven solutions to urban challenges (Mora et al., 2019), smart city policy formulation and implementation are significantly influenced by inherent local characteristics and historical contexts (Angelidou, 2017; Kim and Kim, 2025; Poshai and Intauno, 2025; Indraprahasta and Alamsyah, 2024).

Comparative analysis reveals distinct objectives in smart city practices between the Global North and South, despite both regions embracing smart city branding. Early discourses predominantly focused on technologically advanced Global North cities, emphasizing open data, efficiency, and sustainability (Angelidou, 2017; Yigitcanlar et al., 2019). Conversely, Global South cities often adopt smart city concepts primarily to address basic infrastructure deficiencies and service provision (Das, 2020). For example, Indian smart city plans often include essential improvements such as efficient sewage systems and reliable running water supply (Das, 2020). Similarly, in sub-Saharan Africa, international property developers utilise smart city branding to facilitate political approval and attract investment (Watson, 2015).

However, attributing the diversity of smart city practices solely to the Global North-Global South dichotomy overlooks other critical differentiations such as technological readiness, infrastructure maturity, politico-economic system, and urbanisation processes. For instance, South Korea, having experienced significant industrial success with technology advancement, positions smart cities as its industrial policy, emphasizing technology deployment (MOLIT, 2024), a tendency found in its East Asian neighoubors (Hsu, 2024; Joo, 2023; Wang et al., 2024). In contrast, European cities, with a long history of citizen participation and relatively mature IT infrastructure, often implement smart city initiatives that emphasise collaboration among diverse stakeholders rather than technology itself (Angelidou, 2017; Yigitcanlar et al., 2019). Barcelona's 22@Urban Lab exemplifies this approach, coordinating smart city pilot projects between the city council, private companies, and research institutes (Bakici et al., 2013; Angelidou, 2017). In the United States, smart city practices have largely been shaped by global technology firms such as IBM, Cisco, Alphabet, and Amazon strategically targeting local governments procurement market following the near saturation of their corporate and consumer markets (van den Buuse and Kolk, 2019; Carr and Hesse, 2022).

Smart city practices also significantly vary based on urban development contexts, particularly distinguishing between initiatives in existing urban environments and new developments. In regions with a long urbanisation history, like Europe and America, smart city projects often feature incremental digital upgrades integrated within established urban frameworks, as exemplified by Amsterdam and Barcelona (Agnelidou, 2017; Müller, Park, and Sonn, 2023; Yigitcanlar et al., 2019). In contrast, greenfield developments leverage the opportunity to implement cutting-edge technologies on a "clean slate" (Crivelho, 2015). Notable examples include Masdar City (Angelidou, 2017) and NEOM (Dezeen, 2023), as well as Songdo, Sejong and Busan Eco-Delta in South Korea (Kuecker & Hartley, 2020; Lim et al., 2023; Rugkhapan & Murray, 2019; Yigitcanlar et al., 2019). These projects typically feature comprehensive master planning, high-modernist visions, top-down governance structures, substantial government funding, and aspirations for futuristic economic hubs (Angelidou, 2017; Lim et al., 2023).

Smart city governance models also vary significantly, typically categorised as top-down or bottom-up approaches. East Asian countries often exhibit stronger central government presence. China’s central government, for instance, has provided substantial financial and administrative support for smart city pilot projects (Hu and Zheng, 2021). Similarly, Taiwan strategically employs smart city polices to upgrade its ICT industries (Hsu, 2024), and Singapore collaborates with global technology firms to position itself as an international innovation hub (Joo, 2023). Despite rhetoric emphasizing citizen participation, South Korea maintains a predominantly top-down governance approach, with limited meaningful citizen engagement in flagship smart cities (Lim et al., 2023). In contrast, more decentralised contexts feature greater involvement from city governments, civil society, and citizens in shaping the smart city agenda. Western European cities often favour partnership-oriented approaches, exemplified by Amsterdam’s inclusive and participatory smart city initiatives (Angelidou, 2017; Yigitcanlar et al., 2019).

This brief review underscores the critical role of contextual factors and policy path dependency in shaping smart city initiatives. South Korea offers a particularly intriguing case, given its unique position as a newly industrialised economy bridging characteristics of both the Global North and South. Initiated in the early 2000s, Korea’s smart city approach predates the broader global attention to the smart city concepts (Lee & Chang, 2019). Korean smart cities manifest in two parallel streams of practice: the first involves building new smart cities

as test beds characterised by top-down implementation driven by the central government, especially in the initial phase, and a showcase-oriented approach exemplified by high-profile projects such as Songdo, Sejong and Busan; the second involves retrofitting and upgrading existing cities with somewhat more incremental but still top-down and technology-oriented. The interplay of these streams is shaped by Korea's governance structure, for example a strong central state with significant local autonomy shown in Seoul's case (Lim et al., 2023) and history of rapid industrialisation and urbanisation. Compared to Global North examples, which lean strongly toward participatory, small-scale innovations, Korea's new-city projects appear more futuristic and centralised. But compared to many Global South cities, Korea's smart city initiatives are characterised by technical advancements backed by strong government support.

Evolutionary conceptualisation of path dependency in public policy

Contrary to the Weberian ideal type of bureaucracy (Weber, 2015), which portrays bureaucrats as neutral executors of orders from the top of the hierarchy, bureaucrats often pursue their own individual interests as explained by public choice theorists (Kiese and Wrobel, 2011; Niskanen, 1987). Bureaucrats' individual interests often include securing greater responsibilities, expanded discretionary power, larger budgets, higher salaries, increased expense accounts, more staff, larger offices, the ability to hire personal assistants, and other benefits commonly desired by most people in large organisations.

They have limits in openly pursuing their own interests because political elites, not bureaucrats are usually the final decision-makers in the policy process. But bureaucrats can assert their interests when such assertions are not against political elites' agenda, or public opinion that political elites cannot act against. The focus of political agendas and public opinion may shift rapidly, yet bureaucrats can continue to advance key projects of interest over extended periods. The most convenient strategy for bureaucrats is to promote their interests behind the scenes, away from the public eye and, consequently, from political elites' attention. However, this approach is viable only for smaller and less conspicuous projects. For larger, more conspicuous projects, bureaucrats produce discourses that align with the currently prevailing discourse. They leverage their detailed knowledge to frame their projects as congruent with the political objectives of political leaders and the public. Whether projects are genuinely aligned is less critical than whether they are perceived as such by political elites and the public. Not all such attempts are successful obviously. When they fail, bureaucrats shelve their projects temporarily, revisit them when conditions are more favorable, and adapt new rhetoric, if necessary, to better fit the new dominant discourse. With consistency, they have a good chance of eventually realizing their projects in the long run (Shin, Park, and Sonn, 2015).

Bureaucrats' long-term consistency needs further explanation. Bureaucrats change positions within the bureaucracy and many retire over time, so an alliance among bureaucrats promoting a project does not last for long. So how is this long-term consistency maintained? This is where we diverge from public choice theory. The public choice theory models bureaucrats' behavior on the utility-maximizing behavior of consumers in a competitive market. (Kiese and Wrobel, 2011; Niskanen, 1987). However, this approach has two significant shortcomings in explaining the path-dependent nature of public policies. First, the public choice theory does not account for the collective learning of civil servants. Individual utility maximisation presumes methodological individualism, which means that 1) actors are

omniscient about their own interests and all possible means that they can employ, and 2) actors pursue their interests without regard for others. This framework does not explain path dependency, which often arises from bureaucrats learning from one another and passing knowledge and practices down to subsequent generations and across organisations, which are, we know, common practices. Second, the theory does not fully explain collective behaviours that often prioritise organisational interests over individual ones. For instance, in the South Korean context, bureaucrats often focus on creating or expanding governmental or quasi-governmental organisations that their agency oversees because such organisations would offer positions that may provide employment opportunities for them when they leave the government positions (Moon, 2009). However, not all those involved in creating these positions are on the cusp of leaving, indicating that an immediate self-interest explanation is insufficient. Moreover, decisions are rarely based on perfect information. It is often unclear which of the available options will ultimately benefit the bureaucrat making the decision in the long run. In many cases, it is wise for individual bureaucrats to act in concert to maximise the utility of the organisation to which they belong, to share collective benefits and to ensure long-term stability. In this way, a bureaucrat can maximise the likelihood that they themselves will benefit from the organisation and its members in the long run. This notion aligns with the perspective that collective action can be a rational choice even when individual self-interest is the underlying motivation (Olsen, 1971).

For these reasons, we uphold the utility maximisation assumption but relax the perfect information assumption of public choice theory, positing that bureaucrats aim for collective rather than individual utility maximisation. They pursue organizational rather than individual utility, anticipating that organizational success ultimately serve their long-term individual interests. It should be also noted that, in an imperfect information situation, bureaucrats are unaware of the most efficient means of achieving their goals, leading them to rely on what was proven effective in the past.

This description aligns with Nelson and Winter's (1982) conceptualisation of work routines as the organisational equivalent of genes in an organism. While their analysis primarily addresses private firms, the use of work routines extends to any organisation that exhibits a certain degree of stability. They define work routines as regular procedures that employees adhere to within an organisation, so the organisation's characteristics are traceable to specific work routines. The persistence of these routines over time resembles the transmission of genes across generations of biological entities. Environmental shifts challenge the viability of specific work routines, with organisations that possess or can develop routines suited to new conditions likely to survive. Furthermore, routines encapsulate an organisation's collective knowledge, acting as a repository of successful experiences. In this paper, we pay particular attention to a specific kind of work routine, which we define as the "key routine." A key routine may emerge from small-scale successes as a normal work routine but gain significance through repeated, larger-scale successes, eventually becoming foundational to an organisation's nature. In this study, we argue that work routines, particularly key routines, significantly contribute to path dependency in public policy, as we will demonstrate through a case study of South Korean smart city policies.

Characteristics of South Korean smart city policies

Evolution of smart city policy in South Korea

The origins of the smart city concept in South Korea are often traced back to the "ubiquitous city" (hereafter, U-City) concept, widely used by mid-2000s and institutionalised through the Act on Ubiquitous City Construction (U-City Act) in 2008. This was a decade earlier than most governments began to use the smart city concept (Huh et al., 2024). In the mid-2010s, the smart city concept gained worldwide currency and the South Korean state accepted the smart city concept as the standard term. Accordingly, the government legislated the 2017 Act on the Promotion of Smart City Development and Industry, replacing the 2008 U-City Act (Huh et al., 2024). Key subsequent policies include the Smart City Strategy for Urban Innovation and Creation of Future Growth Engine in 2018, the Smart City Comprehensive Plan (2019-2023), the Strategy for Overseas Advancement of Smart City (Related Ministries, 2019, The Overseas Strategy) in 2019, and the Mid-to Long-Term Technical Roadmap for Smart City with Multi-ministerial R&D Connections (Hyeon et al., 2019, the Roadmap hereafter), as shown in Figure 1.

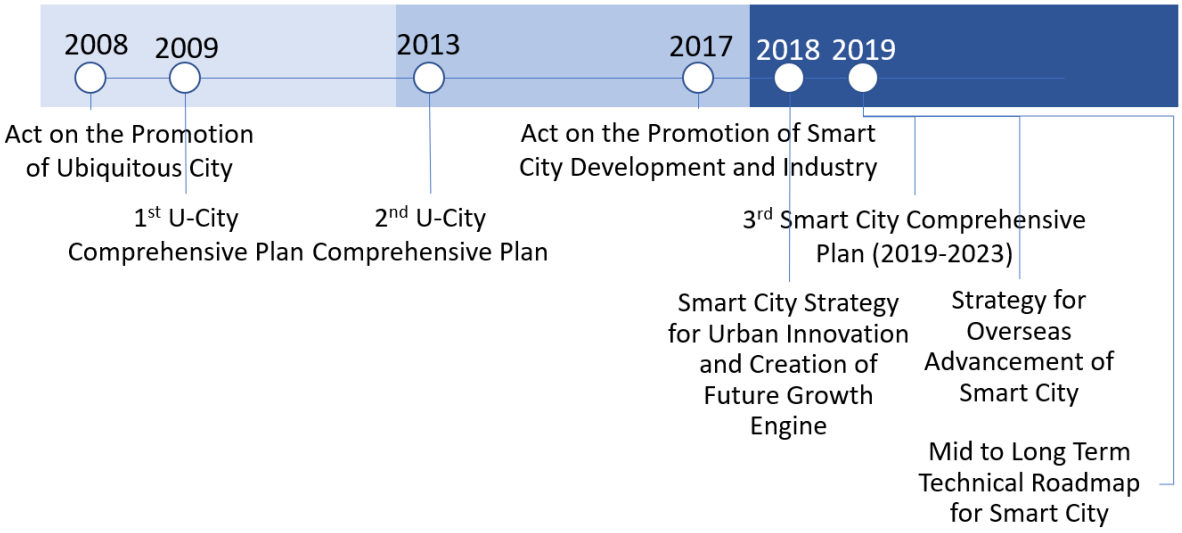

Figure 1. Publication dates of South Korea's key smart city documents

While South Korean smart policies share common global goals such as "sustainable city," "quality of citizen's life," "shared economy," and "governance," as shown on the Smart City Portal (smartcity.go.kr), they have three distinctive characteristics. First, state leadership is evident with large-scale pilot projects led by the state, such as Sejong, Busan Eco Delta City, and the Daegu Data Hub. In addition to pilot projects, numerous government initiatives exist to support private businesses in related sectors. Second, the economic development discourse is prominent; phrases such as "job creation" and "advanced economies" are frequently mentioned on websites. Finally, there is a significant emphasis on exports. The first characteristic has been extensively studied (e.g., Huh et al., 2024; Joo, 2023; Shin, 2016; Sonn et al., 2017), thus we will elaborate on the latter two in the following subsection.

Smart city as industrial policy and export emphasis

Smart city policy functions an industrial policy in South Korea, evident in the titles and contents of key legislation and official publications. For instance, the "Act on the Promotion of Smart City Development and Industry," (also known as the revised Smart City Act of 2017), and the "Smart City Strategy for Urban Innovation and Creation of Future Growth Engine (Presidential Committee for the 4th Industrial Revolution, 2018, hereafter referred to as the Strategy)" are prime examples. As the primary legislation, the revised Smart City Act places equal emphasis on developing smart cities and the smart city industry, dedicating a specific chapter to the smart city industry that covers various policy measures including direct financial assistance and public support for international collaboration.

Similarly, the title of the Strategy itself indicates that the smart city concept is twofold, with "urban innovation" indicating improvements in urban public services and "creation of future growth engine" explicitly signalling industrial policy aspects. The strategy identifies three "global trends" to justify smart city promotion in South Korea without giving clear criteria to determine what constitutes such trends. Such discursive strategy is particularly effective in a society like South Korea, where fast following new trends in advanced economy has been an important strategy for economic success, and thus deviations from global trends are not easily accepted by people. The three trends listed are: 1) smart city promotion as a new model for urban innovation in both advanced and emerging countries; 2) leadership by global firms such as IBM, Cisco, and Google in new technologies; and 3) the formation of global networks and the organisation of Expos to showcase technologies. Notably, the latter two primarily focused on industrial development rather than public services. Point 1), while a very general statement, also contains elements of business and technology upon closer examination of its sub-items, which are: a) well-known smart cities offering data-centred platforms through public-private partnerships and b) Asian emerging countries promoting smart city initiatives to enhance national competitiveness (Presidential Committee for the 4th Industrial Revolution, 2018: 2). It critiques previous U-City policy for insufficient integration with industrial expansion and technological development and the absence of globally presentable best practices (Presidential Committee for the 4th Industrial Revolution, 2018: 4), which also indicates the Strategy's inclination toward industrial policies.

The Roadmap further confirms this industrial orientation, by contrasting Korea's economic competitiveness-focused Smart City policy with the Europe's quality-of-life orientation. This industrial policy nature of smart city policies is also reflected in "Four Years of Moon Administration: Achievements in 100 National Policy Agenda" (Government of the Republic of Korea, 2021), which positions smart city policies under "Leading Nation in the 4th Industrial Revolution Through the Nation of Software Technology, and the ICT Renaissance," and specifically within "Industrial Development for Enhanced Smart City," clearly indicating the administration saw smart city as an industrial policy rather than technology application to public services.

The same is indicated by the organisational character of the Special Committee for Smart City (SCSC, hereafter), which served as the command post for all smart city policies. SCSC was a subcommittee of the Presidential Committee for the 4th Industrial Revolution (PCFIR), a committee tasked with "job creation, re-industrialisation, and national competitiveness." PCFIR listed smart cities as one of the eight innovation-led industries, alongside biotech, fintech, drones, energy, future vehicles, smart farms, and smart factories (PCFIR, 2022).

Civil servants and professionals engaged in smart city initiatives clearly understand the industrial nature of smart city policies. A researcher at the Korea Agency for Infrastructure Technology Advancement (KAIA) asserted that job creation is its main aim (Researcher in KAIA 2). Even urban planners emphasise employment, with one noting, “According to a UN future report, 22% of all new jobs will be in the healthcare industry. How we industrialise them and commercialise them in smart cities through big data is critical.” (Planning Consultant 1).

However, many planners are critical of this industrial approach. For instance, a local government planner highlighted the tension between utilizing ICT to address urban issues and the state’s push for deregulation, market opening, and job creation. This planner stressed that while long-term goals might align, there is short-term confusion among frontline planners regarding priorities. They noted, “For us, what citizen want is the most important. For example, according to a survey, people desire smart street lighting the most. However, for the national government, such an application is too commonplace; the national government seeks something more spectacular, while residents prefer incremental improvements to their daily lives.” (Local Government Planner 1). Similarly, an academic planner maintained, “The goal of the smart city should always be to improve the quality of human life... However, because engineers initiated it (smart city policy), the focus has been on technology itself rather than its usefulness for people” (Planning Academic 1).

In summary, at the national level, the state approaches the smart city as an industry in which industrial policies can be implemented. Researchers, planners, and civil servants involved in smart city policy are aware of the state’s intentions, although not all agree with the state.

Another distinctive characteristic of Korean smart city policies is the pronounced emphasis on export as encapsulated in the “Strategy for Overseas Advancement of Smart City” (hereafter, the Overseas Strategy). The Overseas Strategy explicitly articulates its objective to “promote smart city [development] as the new engine for innovative growth” (Related Ministries, 2019, p. 1). Government’s substantial support includes a $400 million investment with the government contributing 40% and strategic investments in junior debt, allowing private businesses to invest in new technologies and emerging markets without taking high risks. This comprehensive support is further strengthened by the state’s commitment to provide financial support and offer policy loans at an interest rate of 0.1%.

Why and how did MOLIT come to capture the smart city?

We have shown that South Korea’s smart city policy operates fundamentally as an industrial policy rather than focusing on public services. The emphasis on the export drive, a critical component of Korean industrial policy, is also evident. But why?

Packaging smart city as an industrial policy

As the ministry responsible for urban development and infrastructure, smart city as the use of ICT for public services, as in the US or Western Europe, would easily legitimise MOLIT's control over smart cities. However, this position is complicated by the traditional jurisdiction of the Ministry of Trade, Industry and Energy (MOTIE) as the main ministry for industrial policy, or the Ministry of Science, ICT and Future Planning (MSIP) as the main ministry for R&D and innovation. In this context, MOLIT's claim that smart city as an industrial policy falls under its purview appears counterintuitive. The explanation lies in the inherent ambition of

government ministries to extend their responsibilities. While urban public services clearly fall within MOLIT's existing remit, its attempts to extend MOLIT's remit are likely to venture outside its own.

MOLIT's choice of industrial policy as a means of expanding its responsibilities is not so surprising given Korea's historical familiarity with industrial policy. In the 1970s and 1980s, the state selected strategic industries and supported them with private and public investments. The state would then extend a protective canopy over these infant industries with supportive measures such as preferential interest rates, trade protection, streamlined provisioning of infrastructure and land, public investment in R&D, and the coordination among domestic firms (Amsden, 1989; Castells, 1992; Sonn, 2007; Sonn and Choi, 2022). These measures have frequently enabled firms to mature to a level of efficiency and domestic market dominance, which, in turn, allowed them to achieve the economies of scale enough to stand shoulder-to-shoulder with their international competitors (Sonn, 2019; Sonn and Kim, 2020). The success of this strategic approach is evident in the remarkable strides made by the shipbuilding and automotive sectors, which were pillars of Korea's economic ascent in the 1980s.

By packaging smart city as industrial policy, MOLIT effectively adopted a key routine that we defined earlier. Using a key routine increases the likelihood of success, but does not guarantee it. How did MOLIT justify and maintain control over smart city policy, overcoming the common perception that industrial policy belongs to MOTIE and MSIP?

Legitimizing the smart city

One tactic employed by MOLIT is to broaden the definition of smart cities. A senior manager at MOLIT posited that smart city initiatives are "indisputably" within the purview of MOLIT's responsibilities, as they enhance citizens' quality of life and improve public services and management (Interview with Manager in KAIA). Furthermore, MOLIT justifies its authority over smart-city initiatives by referencing legislative mandates. Indeed, the primary legislation governing South Korea's smart city policy—the revised Smart City Act of 2017 and its antecedent, the U-City Act— was crafted by MOLIT, positioning MOLIT as the principal execution body (Interview with Manager in KAIA). A senior manager of KAIA claimed the uniqueness of the South Korean smart city model to the concept's tight connection to with new town developments by the Korea Land and Housing Corporation (LH) in early 2000 where CCTVs and transportation monitoring centres were installed (Interview with Manager in KAIA).

However, MOLIT's broad delineation of smart cities is not fully accepted by all parties. For example, during the second meeting of the Science and Technology Strategy Committee (STSC), a body that coordinates science and technology-related policies across all ministries but is mainly overseen by the MSIT, the smart city was categorised alongside other technology areas such as artificial intelligence, autonomous driving technology, and virtual reality technologies.

Various ministries have initiatives that intersect with smart city concepts- for example, the MSIP implemented IoT demonstration project (2015) and develop an ICT fusion standard framework, while the MOTIE launched smart grid projects. Similarly, the Ministry of Administration and National Security supported the ICT Town Development and personal security technology projects, and the Ministry of Environment managed the Water City project. According to the Roadmap, only four of ten major smart city policies are under the jurisdiction of MOLIT. Although MOLIT's budget for these initiatives is 21 million US dollars—larger than

the 8.2 million allocated to the MSIP—it is still smaller than the 22 million managed by the MOTIE (Table 2-3, p.22, MOLIT, 2019). Despite the Roadmap being commissioned by MOLIT, the technical specificity of this document precluded the authors from designating most policy areas under MOLIT's purview of MOLIT.

Tensions arose within the SCSC, particularly between planners and engineers. Planners suggested appointing senior planners as master planners for the two pilot projects, but ultimately, IT specialists were chosen. One planner on the committee lamented, "They say we can't repeat [the mistakes of new towns like] Bundang and Ilsan, but I say [in their vision] there is no city in their version of smart city. It is all about technology." Yet, he conceded that, "the smart city initiative cannot be monopolised by MOLIT. It requires the collaboration of the MSIP, among others, for R&D, budgeting, policy, and so forth; hence, there is a need for the Smart City Special Committee" (Planning Academic 3). Another planning academic observed, "In smart city policy, I don't see a clear demarcation between the technology policies of the MOTIE and MOLIT" (Planning Academic 1). This suggests that MOLIT's assumption of a leadership role in smart city policies is not without disagreement.

Furthermore, even in the projects under MOLIT's management, smart city policies often fall outside conventional policy domains. "Engineers, such as autonomous vehicle researchers, struggle to integrate their work within the smart city framework," noted Planning Academic 1. Such limitations on MOLIT's control over smart cities are evident in higher education. "In the only two university departments in Korea that include 'smart city' in their names, most of the faculty members are engineers" (Local Government Planner 1).

Some stakeholders expressed scepticism towards Smart City policies. "For them, it's beneficial as these policies inflate their budgets. However, if you scrutinise the policy, there is no actual 'space' despite the smart city label. MOLIT is leading, yet the bureaucrats within MOLIT lack the expertise to manage it effectively, not due to general incompetence but because it is beyond their specialty. Hence, they can do little beyond handing over tax money to private businesses" (Planning Academic 1).

Overall, we can conclude that MOLIT bureaucrats sought to expand their control over smart cities by widening their definition of a smart city and such attempt was successful to certain degree despite its own limitation in expertise. MOLIT's attempt to capture smart city policies is consistent with the public choice school view that bureaucrats attempt to increase their responsibilities, personnel, and budgets.

The need for smart city export discourse

As discussed earlier, another notable characteristic of Korean smart city policy is the prominence of the export discourse. Once again, we ask why the export discourse is necessary. The export discourse is so influential that even those directly involved in smart city development find it convincing. A senior planner on a smart city pilot project states that "The country's economic foundation is trade, and the smart city represents the next generation of tradable goods. 5G, big data, and digital twins are future staples, and we are cultivating them while constructing the city. If successful locally, it will likely proliferate to other regions and, eventually, to other countries" (Planning Consultant 1).

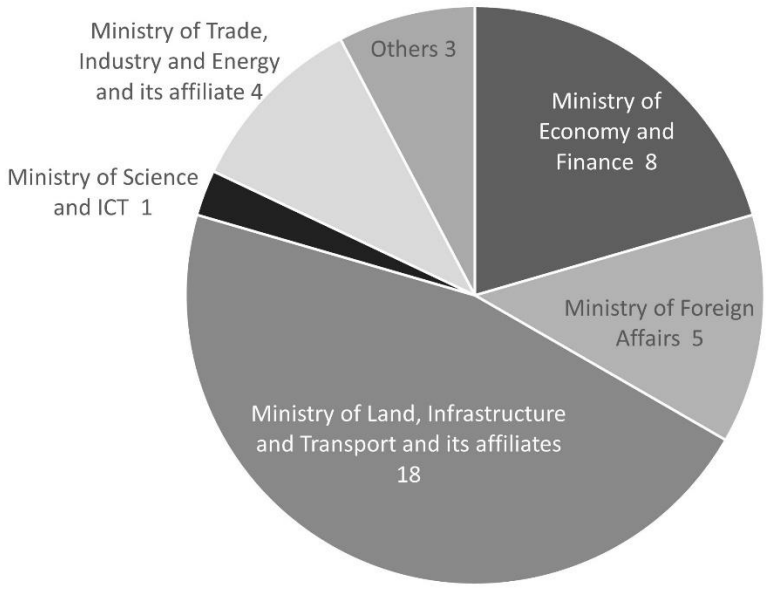

Figure 3. Division of labor among ministries for 25 objectives in smart city export strategy

Data: Compiled from Related Ministries (2019)

MOLIT's ambition to secure a dominant share of smart city policy is also evident in the Overseas Strategy. This report, intended as a cross-ministerial document, is primarily drafted by MOLIT; thus, it reflects the ministry's goals. As shown in Figure 3, of the 25 projects listed, MOLIT and its affiliates such as LH were tasked with 18 items, either independently or in corporation with other agencies. The Ministry of Foreign Affairs (MOFA)'s involvement in 5 projects is explained by the strategy's international focus, while the Ministry of Economy and Finance (MOEF)'s responsibility for 8 projects reflects its crucial budget allocation role. Potential competitors for smart city policy control, MSIT and MOTIE, are allocated only one and four projects, respectively. This distribution of responsibilities and budgets implies MOLIT's intention to secure its dominant position in smart city.

However, despite MOLIT's determination, experts within and outside the ministry question the feasibility of exporting smart city models. The main hurdle is the high management costs of ICT-intensive urban systems. An international development specialist notes that governments in the Global South and even local governments in South Korea are often reluctant to adoption of extensive smart technologies because of financial concerns. The expert explains, "Their (developing countries') limit is the installation of CCTVs and crime monitoring centre. Beyond that, they lack financial and human resources for management." Similarly, a planning academic notes, "Countries in the Global South may be happy to have smart cities but are unwilling to pay for them. LH boasts South Korea's advanced technology to an audience uninterested in purchasing them." (Planning Academic 1). In the meantime, financially capable countries such as China and those in Western Europe usually possess their own technology. Their technologies may or may not as good as South Korea's, but "they have what they immediately need and are more compatible with their existing infrastructure" (Planning Academic 2).

Control issues also arise during international collaborations. For instance, when the LH proposed to Chinese local governments to build industrial estates based on South Korea's U-

city model in the early 2000s, the Chinese local government did not accept the proposal. Instead, they preferred conventional industrial estates without smart infrastructure because they were concerned that transplanted Korean technology might undermine Chinese local government's control over the development project and its future management (Manager at KAIA).

Several interviewees distinguish between technology transfer and true smart city exports, questioning whether standalone solutions like South Korea's sophisticated integrated transport payment system[1], genuinely constitute smart-city export. "Is it genuinely a smart city export? I have my doubts," said the international development expert. He claims that projects like this "are ICT projects masquerading as smart city projects." A smart city researcher we interviewed expressed similar views. saying "We are exporting standalone solutions rather than an integrated platform, with each system operating independently at the city level" (KAIA Researcher 1).

However, some perspectives are more optimistic. A member of the Smart City Committee posited that the success of the pilot projects in Sejong and the Eco-Delta City could be transformative. "Demonstrating our technologies in Sejong could turn them into exportable assets" (Planning Academic 3). Whether this viewpoint holds true remains to be seen; however, at least for now, it is evident that the smart city export policy is not fulfilling its intended goals.

Interpreting organisational self-interest and discursive strategies

MOLIT's aspiration to capture smart city policy by expanding its definition is unsurprising, consistent with what public-choice school has demonstrated theoretically and empirically. It is also not important for the purpose of this paper whether MOLIT was successful in this expansion because various contingent factors influence the outcome. What is important is the strategies that MOLIT used: 1) utilizing old developmentalist strategies, and 2) presuming those strategies as the only and best way to legitimise the policy.

Both findings can be interpreted from the evolutionary economic perspective. Before MOLIT adopted the developmental strategy, it had become a key routine in other ministries. Since the 1970s, bureaucrats in a developmental state first communicated with the private sector to identify industries with growth potential (Evans, 1995). In collaboration with ministry colleagues and academic consultants, they devise a comprehensive strategy to support such industries (Chang, 1994). This strategy includes expanding their and the ministry's responsibilities and establishing quangos under the ministry's control, ensuring their promotion, and securing post-retirement job opportunities (Sonn and Kang, 2016). The individual and organisational interests of bureaucrats together with the national economic development strategy in one package, what we would call 'developmentalist packaging', first developed by the Ministry of Industry and Resources, became a key routine in the 1970s and later adopted by the Ministry of Information and Communication in the 1980s.

MOLIT has only recently begun to employ the same key routine, establishing the International

[1]The use of a single transport payment card across all modes of public transport is currently widespread. However, in the early 2000s, South Korea was one of the few countries with the legal, organisational, and technological frameworks necessary to enable such a payment system.

Urban Development Cooperation Centre within the LH in 2012 and the Korea Overseas Infrastructure and Urban Development Corporation (KIND) in 2018 to support overseas projects. Their roles include project planning, conducting feasibility studies, offering reliable project information, and improving access to financing. These were all done under a full or partial influence of MOLIT. As a latecomer to developmentalist packaging, MOLIT has aggressively promoted developmentalist policies. The introduction of the ubiquitous city and later the smart city was part of this aggressive promotion.

Behind MOLIT's and LH's drive to export smart city concepts lies a long history of "city export" efforts. Around 2008, when the second-generation new towns were nearly completed in South Korea, China and India announced plans to build over 100 new towns each. With Korea's large-scale development era ending, the South Korean government perceived Chinese and Indian new towns as golden opportunities. In overseas construction markets, South Korean companies such as Samsung, Hyundai, and Daewoo have been upgrading within the value chain. Started in the 1970s with a low value-added manual labour function of the value chain in Vietnam and the Middle East, South Korean companies in the 2000s were engaged in high-value-added functions such as design, engineering, and project management. However, MOLIT aspires to achieve more, regarding a smart city as an opportunity to go beyond one-off infrastructure projects or single-item exports, and export comprehensive urban development packages including IT solutions and legal frameworks as explained in the Overseas Strategy.

However, these aspirations for export are tempered by reality. "City export does not happen overnight," denotes a development specialist. Former imperial powers had advantages in their former colonial markets, where the former's legal and infrastructural legacies persisted. Singapore and Japan were using the nation's name as a brand. More recently, China quickly emerged as a major player with its government support, rapid accumulation of domestic experience, and financing through the Belt and Road Initiative and the Asian Infrastructure Investment Bank.

Despite these challenges, South Koreans hope to rely on the potential of ICT to revolutionise the construction sector. To this end, MOLIT, through KAIA, launched the K-city network program with the aim of "discovering intergovernmental (G2G) smart city cooperation projects and supporting the overseas expansion of Korean companies (smartcity.go.kr)." The program supports two types of activities conducted by Korean companies: smart city project planning and solution demonstrations. The government believes the programme could serve as a primer for future lucrative contracts.

In reviewing MOLIT's city export attempts, two observations stand out. First, bureaucrats view exports as a routine aspect of business and, therefore, do not consciously choose it; instead, they think of exports as a default. Second, bureaucrats believe that export rhetoric is persuasive to the public and political decision-makers, given South Korea's historical reliance on exports and the collective memory of strong export drives during the 1970s and 1980s developmental eras.

In addition to discussing the findings, we should also discuss what we did not find. As smart city is a concept imported from outside South Korea, we expected to see how policies from other countries are introduced and translated into the local context in dynamic interactions between global changes in smart city policy and local political and policy changes as discussed in policy mobility literature (McCann, 2011; Chang, 2017). However, as discussed in previous sections, attempts to import policies were not emphasised by our interviewees in government

and those working closely with government. Only academic planners, who see European approaches as more desirable, lament the absence of importation. This absence is in fact consistent with other findings in this research. Bureaucrats in South Korea often use globally circulated concepts such as smart city, industrial cluster, world city, eco city, but they are interested in using the concept to achieve the project they are interested in. (Sonn and Kang, 2016; Sonn and Park, 2023) In most cases, the debate about the real meaning takes place in academia and does not really influence government policies.

Conclusion

The primary goal of this study is to understand the path-dependent nature of South Korean smart city policies. Our findings reveal that the smart city initiative in South Korea fundamentally operates as an industrial policy rather than an urban public service policy. Given its nature as an industrial policy, it is not surprising that elements aimed at export are conspicuous. MOLIT's pursuit of its own organisational interest is the driving force behind these unique characteristics of South Korean smart city policies. In other words, MOLIT leveraged the smart city concept to broaden its responsibilities within the national government and supported the construction sector. These findings underscore the importance of recognizing organisational interests to fully comprehend the policy outcomes observed.

In addition to the literature on the diversity of smart city policies, this study contributes to the debate on the death of developmental states. In the developmental state literature, the focus is whether a developmental state has ceased to exist. Mainstream consensus suggests that the developmental mindset persists and that the developmental state continues to steer the transformation of East Asian capitalism. This paper enters the debate not to appraise whether the state is developmental in nature but to investigate exactly how the developmental characteristics of the state have persisted, even when the state is overshadowed by the private sector and when industrial policy has become ideologically unpopular. We examine how civil servants' ways of managing the export economy in the 1970s and 1980s were passed on to the next generation and even to other units within the government not traditionally linked to industrial policy, such as MOLIT. Similar approaches to smart city development are found in South Korea's neighbours, such as Singapore, Taiwan, and China, as reported by Hsu (2024) and Joo (2023). However, there is little evidence that these countries influenced one another in formulating their smart city policies. Like our own analysis, both Hsu (2024) and Joo (2023) describe these cases as outcomes of endogenous policy formation rather than the result of external influence. While the term "smart city" was adopted, they emphasise that the actual policies in these three countries are deeply rooted in their economic strategies of the past. Comparative research on the formation of smart city policies could offer valuable insights into policy-making processes in these former developmental states, as well as the relationship between state structures and policy trajectories.

This paper also enriches wider organisational theory by examining organisational isomorphism within larger institutions (Beckert, 2010; DiMaggio and Powell, 1983), specifically, the transmission of 'genes' or routines across different units of the same organisation. When a work routine that was successful in the past within an organisation is repeated, we observe institutional inertia. When a routine proven useful elsewhere is adopted, organisational isomorphism is observed. The 'proven model' signifies two related but distinct

concepts. The first is the literal interpretation, i.e. a policy that has already achieved its intended goal. The second interpretation makes the distinction between decision-makers and officials. A policy may or may not achieve a nominal goal, but what actually matters is that decision-makers are convinced that the policy will achieve the goal. Decision-makers are more easily persuaded when bureaucrats use the proven formula from the past. What we term a 'key routine'—a more established subset of routines that is often associated with the organisation's success—is more likely to be visible and, consequently, more readily diffused both internally and externally, contributing to institutional inertia and institutional isomorphism.

In the case of the South Korean government, that formula is export promotion. Consequently, bureaucrats often leverage export promotion as the nominal goal of the policies they champion–a tendency that permeates even departments and divisions unrelated to exports. This represents a case of organisational isomorphism.

This paper also contributes to the literature by complementing research on policy mobility. Policy mobility refers to the circulation and transfer of urban policies, practices and ideas between different cities and regions (McCann and Ward, 2011; Peck and Theodore, 2010; Temenos and McCann, 2013). The diversity of smart city practices can be in some cases explained by policy mobility, whereby cities emulate and modify global discussions or case studies (Crivello, 2015), leading to differentiated initiatives. Policy mobility, including that of smart cities, is rarely straightforward and typically involves strategic local adaptation. As Rugkhapan (2021) argues, policy mobility unfolds through local political processes.

Our finding of a lack of policy mobility complements, rather than contradicts, existing research in the policy mobility literature. Within this framework, scholars emphasise how the global discursive and institutional context creates an environment in which local actors adopt smart city concepts. We interpret their findings as follows: (1) multiple discourses about cities are circulating at any given moment, allowing local actors to select those that facilitate their actions or align with their interests; and (2) local actors retain a degree of interpretive freedom in translating globally popular terms into local discourse and concrete policies. In short, we do not perceive the global context as a structural force that constrains local actors, but rather as a resource that certain actors can use strategically to advance their own interests.

This explains why, despite changes in the global context, policymaking processes or "policy regimes" do not change rapidly. During the mobility of policies or policy concepts, patterns emerge because local actors engage with new ideas in ways that are familiar to them. This familiarity not only provides convenience but also serves as a tested approach to advancing their own interests. In this process, rather than genuine policy mobility, policies are often merely cited as rhetorical embellishments. Just as academic references should ideally reflect their original meanings but are frequently cited for reasons such as adding prestige, signalling affiliation with particular scholarly camps, or demonstrating comprehensive knowledge, policy citations can serve similar functions.

The findings of this paper point to several avenues for further research. Given the strong emphasis on exporting smart city models and MOLIT's initiatives such as the K-City Network, there is a possibility that actors involved in smart city policy will actively promote the South Korean model. Studying such cases would be particularly interesting, as they represent exporter-initiated policy mobility, which contrasts with the more common importer-initiated mobility typically discussed in the policy mobility literature.

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Appendix: Interviewees and interview dates

1. Member of The Special Committee for Smart Cities (12 April 2019)
2. Local government planner (17 April 2019)
3. Researcher in KAIA (3 June 2021)
4. Manager in KAIA (5 July 2021)
5. Planning academic 1 (1 July 2021)
6. Planning academic 2 (29 June 2021)
7. Planning academic 3 (12 April 2019)
8. Overseas development specialist (9 September 2021)
9. Senior manager at MOLIT (9 August, 2018)