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# Reflections on policy capacity development for industrial policymaking in developing countries

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**Reflections on policy capacity development for industrial  
policymaking in developing countries**

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## **Abstract**

In the context of a renewed global interest in industrial policy as a driver of development, this paper identifies an opportunity to discuss issues around policy capacity and policy capacity development, particularly in developing countries. The premise is that discussions on how governments can implement more efficient and effective industrial policies to foster industrialization rarely directly discuss the requisite government policy capacities needed for the purpose. The discussion suggests that to increase industrial policy capacities, developing countries need to invest in strengthening the professionalization of public officials, improve their ability to systematically assess the socioeconomic impacts that can be associated with public policy interventions. In short, governments need improved ability to engage with evidence and to substantiate policy learning. In addition to efforts to strengthen organizational tools, resources and processes, developing country governments also need to invest in dynamic capabilities, including for networking and collaboration with an increasingly heterogeneous multi-stakeholder base. Hence, governments may be better placed to anticipate and address emerging opportunities and challenges with implications on industrial development.

**Keywords:** Policy capacity, industrial policy, manufacturing sector, economic development, developing countries

**JEL Codes:** H83, L52, O25, O38

## **1. Introduction**

In recent years, there has been a resurgence in the importance of industrial policy as a catalyst for development, strategic autonomy, and, increasingly, resilience against unexpected shocks (Juhász et al., 2022; OECD, 2022; UNIDO, 2021). Several advanced industrialized economies and some rapidly industrializing countries have adopted ambitious industrial policy programs to underpin strategic economic transformation (China Daily, 2022; Senate of the United States, 2022; UNIDO, 2023a). Comprehensive multibillion investment programs aim to foster innovation and reorient industrial development by embracing digital transformation, amplifying energy efficiency, and fostering sustainability in industry (European Commission, 2020; SCPRC, 2017; The White House, 2022). The level of investment committed by advanced economies is sizable compared to available resources in hand for developing countries.

Several of these industrial development programs in advanced economies introduce explicit considerations around technological and industrial sovereignty, which aim to reduce external dependencies by strengthening local sourcing and/or diversifying supplies of raw materials and key technologies such as semiconductors to countries perceived as more likeminded partners (EU Strategic Autonomy Monitor, 2022; Irwin, 2023; Serger et al., 2023; Sullivan, 2023). The upshot, growing trade and investment tensions among major global industrial players, pressures to reorganize global value chains, and attempts to introduce conditional access to key technologies required for the greening and digital transformation of manufacturing (Kannan & Feldgoise, 2023; Sullivan, 2023; The White House, 2022).

A matter of concern revolves around the possibility of a perilous interplay of geopolitics and public aids to strategic economic activities, and threats on economic integration and globalization as a system to rule international economic relationships (The Economist, 2023a). Former globalization champions seem to increasingly be turning their backs on a system they have benefited from significantly for decades (The Economist, 2023b).

In this increasingly intricate environment, developing countries are compelled to pursue novel approaches to industrial policymaking, to build the domestic productive capabilities required to achieve low-carbon and digital transitions, foster job creation, boost productivity and economic growth while improving on social inclusiveness (Ferrannini et al., 2021; Ruiz Durán, 2019; Santiago, 2018; United Nations, Inter-agency Task Force on Financing for Development, 2023).

The complexity of the tasks imposed particularly on policymakers in developing countries cannot be underestimated. Yet, discussions on how governments can implement more efficient and effective industrial policies to foster industrialization rarely directly discuss government policy

capacities needed for doing so. This tends to be problematic, as the debate about the ability to translate industrial policy into ‘implementable’ strategies is much needed, particularly in a context of revival of interest by both academia and policy makers in industrial policy.

Strengthening policy capacity is imperative for both developed and developing nations alike. The levels of knowledge and capacities required to formulate and implement industrial policies in a post-pandemic world have significantly risen (UNIDO, 2021). Although it was once thought that wealthy countries were all distinguished by their strong and relatively capable states while poor countries featured weak and frequently ineffective states, the experience of the COVID-19 pandemic has challenged this easy association (Lindsey, 2021). Even some developed countries lacked adequate state capacity to deal not only with sanitary challenges (Lindsey, 2021), but also with ensuing economic and productive aspects of the crisis (UNIDO, 2021).

From the above, two research questions guide the discussion in this paper. First, what kind of frameworks are there to inform and guide policy capacity development efforts? Second, what lessons can be gleaned to assist developing countries identify and prioritize policy capacity efforts aligned with the demands resulting from a changing landscape around industrial development in a post-pandemic world? In addressing these questions, this paper proceeds as follows. Section 2 takes stock of different strands of literature on policy capacity. Our intention is to identify the extent to which industrial policymaking is explicitly addressed, and the extent to which a framework suitable to characterize policy capacity tailored to the case of industrial policy is possible. Section 3 is a brief attempt at illustrating the linkages of policy capacity and manufacturing development in developing countries. Section 4 builds on the preceding sections to propose some policy capacity gaps that would deserve special attention in developing countries. Finally, Section 5 provides some concluding remarks.

## **2. Policy capacity as a field of study**

According to Cingolani (2013), the concept of state capacity originated from an interest in understanding the role of the state in development, a highly positioned objective in the agenda of the political sociology of the second half of the twentieth century. Ever since, the role of state capacity in development is subject to extensive cross-disciplinary research in the broad field of social sciences.

In *political sociology*, this interest promoted the formation of two traditions (Jessop, 2001). First, in the 1960s, neo-Marxist authors, mostly from Europe, were motivated to present an updated Marxist view of the state, which contrasts with the emerging notion of a welfare economy. Then, in the late 1970s and 1980s, the institutional discourse dominant in the United States adopted a

state-centered view that resumed a Weberian tradition of modern states' interpretation. These studies discussed topics such as sovereign integrity understood as the extent of control over the State's territory; loyal and qualified employees; fundraising and application of financial resources; area-specific skills; and adaptability of policy capacities (Evans et al., 1985). Emphasis was on topics such as the role of bureaucracy and the monopolization of coercive power by states (Cingolani 2013). These traditions perceive state capacities to act in accordance with a state's objectives, as the capabilities to avoid or at least navigate pressure from various groups in society (Skocpol, 1985). Moreover, there is a tradition in this field supporting that public sector capacities can be best developed by recruiting and motivating the best talent through Weberian means of meritocratic recruitment and career management to make working for government either financially competitive and/or even more rewarding/prestigious than working in the private sector. (Mazzucato, Qobo, et al., 2021)

From a *political science perspective*, Brenton et al. (2022) assert that the earliest capacity-related works date back to the 1960s and 1970s when authors mostly in the United States focused on understanding reasons for policy failure by analyzing bureaucratic capacity, or the capacity to govern, mostly in terms of rational structures, authority, and leadership (Dror, 1969; Graham, 1961). Later on, issues around political responsiveness and learning capacity entered the debate. (Deutsch, 1963). In the 1980s, attention turned to the administrative reforms implemented, first, by the United States and the United Kingdom, and later by governments elsewhere in the world, as a response to the two oil crises emerging in the 1970s.

Later, literature observed the "hollowing out of the state" (Rhodes, 1994) with a decline in central capacity. Studies that until then had made little or no distinction between policy and state capacity, now stressed the notion of "governance capacity" used along with the inclusion of non-state actors (Brenton et al., 2022). This trend intensified throughout the 1990s, as the rise of neoliberalism and the discrediting of the state made the idea of "governance capability" gain attention, giving way to the inclusion in the analyses not only of states but of other actors, such as the private sector (Bovens et al., 2001; Dror, 2002; Howlett & Ramesh, 2014; Lane, 1991). Considerations on administrative - organizational and operational - capacities emerged during the 2000s, with analyses of management, programming, monitoring and evaluation capacities – and capabilities - of states, which were brought back into the discussion (Dimitrova, 2002; Hille & Knill, 2006; Hou et al., 2003; Moore, 2000).

Generally, these studies were an attempt to answer at least one of the following questions: *what* can be achieved through built capabilities, or *how* capabilities can be built (Haque et al., 2021). Regarding the *what* can be achieved, policy capabilities may imply the ability to develop



programs, manage resources, evaluate activities, and learn lessons for future activities (El-Taliawi & Van Der Wal, 2019), or to have the ability to make policy decisions and effectively formulate and implement policy decisions and goals (Cingolani, 2018). Conversely, when focused on the *how* state capability can be built, attention is directed to more specific topics, such as the autonomy of bureaucracy, or how to improve human resources (Cingolani, 2018). Yet, according to Haque et al (2021, 3) ideally, both *what* and *how* questions should be considered simultaneously.

Interest in the role of the state in promoting economic development is strong in the field of *development studies* (Amsden, 1989; Johnson, 1982; Ohno, 2012; Rodrik, 2009; Wade, 1990), including through the implementation of industrial policy (Chang & Andreoni, 2020; Cherif & Hasanov, 2019; Rodrik, 2004, 2009). While the issues may not be central to the research carried out, consideration is granted to the role of policy capacities, in addition to different kinds of capabilities, in the process of structural transformation led by the developmental state. For example, Evans, (1995) enquires about the extent to which the public capacities of different developing countries proved decisive in explaining the success - or failure - of their industrialization and technological catching-up. The author departs from the idea that states vary in how they are organized and tied to society. In his view, in some nations the state can be understood as ‘predatory’, as it tends to extract value and provide nothing of value in return. In others, the state is developmental, as it actively promotes economic industrial transformation. By contrast, in other countries, state actions tend to fall in between those of predatory and developmental states. (Evans, 1995)

Amsden, (2001, 3) suggested three generic technological capabilities needed for nurturing knowledge-based sectors such as manufacturing: “production capabilities” (the skills necessary to transform inputs into outputs); project execution capabilities (the skills necessary to expand capacity); and innovation capabilities (the skills needed to design entirely new products and processes)”. In this case, the ability of governments to achieve policy objectives is implicit in the discussion of industrial policy interventions underpinning production capability building. Cherif & Hasanov (2019) likewise stress the government’s ability to intervene for creating new capabilities in sophisticated industries, as one of the crucial elements in the industrial development strategies pursued by East Asian governments. Discontinuity in policy design and implementation associated due to political cycles, in particularly those associated with changes at the presidential level, is the source of major challenges to promote development. Park et al. (2021) and Dutrénit et al. (2018) illustrate these challenges looking into the cases of the Republic of Korea and Mexico.

Kattel & Mazzucato (2018) suggest two common but often disjointed traditions are used for explaining the notions of policy capacity and firm capabilities: On the one hand, a *Weberian tradition on public capacity for policy making*, and on the other hand, a *Schumpeterian tradition of dynamic capabilities in firm*. Regarding the Weberian approach, like other branches of social sciences, the notion of capacity building is widely used in studies about developmental states. A recurrent theme is the capabilities of bureaucrats and their role in the successful implementation of industrialization plans, particularly in Southeast and East Asian countries. (Amsden, 1989; P. Evans, 1995; Wade, 1990)

It is no coincidence that one of the first definitions of the developmental state describes it as a predominant policy orientation toward development supported by a small and inexpensive elite, a bureaucracy centred around a pilot organization with sufficient autonomy (Johnson, 1982). This research agenda assumes that bureaucrats could best perform public sector capabilities through Weberian means of meritocratic recruitment and career management (Kattel & Mazzucato, 2018). This notion is also explored by Evans (1995), who argues that successful state action requires capabilities and awareness about its own limits, and a combination of a coherent internal organization and close links to external society, which is called ‘embedded autonomy’ (Evans, 1995, 12). Hence, developmental outcomes depend partly on what states do with the capabilities they have (Evans, 1995). Evans & Rauch, (1999) corroborated this idea through a quantitative analysis testing the relevance of some ‘Weberian elements’, such as merit-based recruitment and career systems, on a broad sample of countries.

Kattel & Mazzucato, (2018) criticise the Weberian framework of capacities for its inability to capture the evolutionary dynamics in development processes. Hence, it cannot explain why specific constellations of capacities become more successful than others. It likewise misses a mechanism to explain the creation of variety and the selection mechanisms, which is frequently played by the market in the context of firms.

By contrast, the *Schumpeterian tradition* of dynamic capabilities focuses on the ambidexterity of “how to exploit new opportunities while continuing to exploit existing strengths?” (Kattel & Mazzucato, 2018, 10), which draws attention to a dual role for states in fostering development. First, states can support existing productive activities; and second, states can behave as an entrepreneurial actor actively involved in the identification, creation and tackling of windows of opportunity to further improve development prospects. Unlike the extensive discussion about policy capacity found in political sciences, the interest in capabilities by management and innovation scholars in the Schumpeterian tradition has centered on understanding the capabilities of firms. According to Teece & Pisano, (1994), whereas “dynamic” refers to some strategic

responses required when timing is critical, “capabilities” stresses the crucial role of strategic management in the appropriate adaptation, integration and competencies in constantly changing environments.

Kattel & Mazzucato (2018) propose a synthesis of the Weberian notion of capacities and the Schumpeterian understanding of dynamic capabilities, as briefly described above. According to the authors, it is possible to identify dynamic capabilities in the public sector; such capabilities drive change that “in turn feeds back into capacities through sociopolitical feedback mechanisms” (Kattel & Mazzucato, 2018, p. 10), thereby acting as the selection environment thus far missing in the Weberian tradition. Hence, while dynamic capabilities focus on skills within firms that enable change in an uncertain environment, public sector capacities concentrate on structures within public organizations that enable them to become change agents within a wider public sector context (Karo & Kattel, 2018). Dynamic capabilities operate at distinct levels of capacities, namely state, policy and administrative, which are closely interlinked within policy cycles. (Kattel & Mazzucato, 2018)

Mazzucato, Qobo, et al., (2021) suggest that this understanding of dynamic capabilities, defined as the ability of an organization to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments (Kattel, 2022), can be extended to the study of policy capacities. Traditionally, when analyzing capacities associated with the public sector, authors tended to focus on stability features, such as continuity, transparency, predictability of services and interventions, while sources of dynamisms were often seen to be external to the public sector, such as private sector practices or individual leaders. This is associated with a tradition of thinking about public sector challenges in terms of how to fix market failures and promote more efficiency.

The introduction of the notion of static and dynamic capabilities highlights that the public sector bears responsibility for promoting long-term resilience and stability of societies, but also agilely responding and adapting to changing environments. These capabilities would allow for more effective responses and create the conditions for generating innovation in and by public organizations ranging from public procurement to tackling emergencies, such as the consequences of the pandemic crisis (Mazzucato et al., 2021). This notion of dynamic capabilities fits squarely with the United Nations Inter-agency Task Force on Financing for Development's (2023) recommendation to both developed and developing countries to learn continuously from policy efforts, as this will enable them to identify emerging policy solutions, learn from failures, and allow for policy experimentation, monitoring, evaluation and revision.

## 2.1. Policy capacity as skills and resources

Recent contributions to the literature propose a representation of policy capacities in a matrix form, which tries to capture the complexities and the different layers in which such capacities need to be developed and mobilized. Wu, Ramesh, and Howlett (2015) understand policy capacity as a set of skills and resources needed to perform policy functions. These capabilities are given by three types of skills and competencies – analytical (or technical), operative, and political - and three levels of resources and capacities - individual, organizational, and systemic - needed to perform policy functions. The combination of these skills and resources results in a set of nine basic types of policy capacities as shown in Table 1.

**Table 1. Examples of public policy capacities**

Capacity/Level	Individual	Organizational	Systemic
Analytical	Officials with the ability to access and use scientific-technical knowledge and methodologies.	Availability of staff with analytical skills, existence of machinery and processes to collect and analyze data, and organizational commitment to evidence-based policies.	General state of the science, statistical and educational infrastructure that enables policy makers to access information relevant to the performance of their analytical and managerial functions.
Operational	Managerial skills of senior officials to perform key tasks in the public service.	Institutional conditions surrounding the functioning of public administration organizations, and the working conditions within these organizations.	Coordination of efforts between governmental and non-governmental actors to solve specific collective problems.
Political	Political knowledge and experience, including relational, negotiation and other skills or “political acumen”.	Relationships with governmental and non-governmental partners conducive to learning by jointly identifying problems and solutions.	Environmental conditions surrounding government actions, including those that give legitimacy and directionality to government actions.

Source: Author based on Wu, Ramesh, and Howlett (2015).

The nature and extent of the policy capacity gaps can be ascribed to actors that are individual, organisational (teams, within government), and system level (interactions between system players such as government and the industrial sector) (Wu et al., 2015). The actors may lack either analytical, operational and or political capacities, or find it difficult to put those capacities in place due to constraints at the individual, organizational or systemic level. According to Wu et al., (2015), analytical capacities grant technical soundness to policy actions that, if properly executed, contribute to the achievement of policy objectives. At an operational level, policy capacities enable the alignment of resources and policy actions in practice. Finally, political capacities allow for obtaining and maintaining societal legitimacy and support to carry out policy actions.

Wu et al., (2015) argue that this model is applicable to different policy processes, from the formulation of priorities to the implementation and evaluation of actions, which is consistent with the notion of industrial policymaking as a cumulative learning and capability development process. This suggests the possibility that certain resources or skills are applicable in different areas of public activity or intervention, while there is close interconnection and feedback loops between different levels of resources or capacities. The model recognizes the interconnectedness, complementarity and even dependence of certain public sector activities on the actions of - and thus the existing capacities of - other agents or organizations which it collaborates or interacts with, as part of the policy-making process. The model facilitates a more comprehensive view of policy capacities, incentives and sanctions that shape the action of public officials.

## **2.2. Embedding policy capacities in the policymaking cycle**

Originally proposed by Lasswell (1956), the notion of a policy cycle has become the most common approach to identify different stages of the policymaking process (Jann & Wegrich, 2007). Even though the model has been originally conceived as evolving in a chronological order, later it became clear that in fact stages tend to occur concomitantly. The policy cycle entails different formal and informal actors who interact in different political arenas, for discussing, approving, and eventually implementing public policies with different levels of power and leverage (Howlett & Ramesh, 2003).

In a classical perspective, policy cycles comprise four stages, namely: (1) strategy or agenda-setting, (2) policy formulation, (3) policy implementation, and (4) policy evaluation.<sup>1</sup> Each of these stages would be associated with specific types of policy capacities, as required to perform intended policy actions, and achieve intended policy objectives. As of our current knowledge, a comprehensive investigation into the specific policy capacities implicated across the different stages of the policy cycle is pending. One can infer some pertinent elements based on the literature.

Traditionally, the first “stage” of a policy cycle is agenda setting, whereby social problems are converted into policy goals and proposals for government action, thus preceding the adoption of new policies (Hays & Glick, 1997). Agenda-setting scholars have explored the processes and mechanisms that determine how policy problems are set – or not – on the agenda, their possible solutions, and how they can be converted into policy outcomes (Peterson & Jones, 2016). This stage can also be understood as the moment when a list of issues and priorities is created that receives serious attention from groups and individuals inside and outside government (Cohen, 2016). For transformational changes to occur, however, the role of policy entrepreneurs, actors who engage in collaborative efforts in and around government to promote policy innovations, becomes critical (Cohen, 2016).

Mintrom (2020) indicates that interest in policy entrepreneurs has grown over recent years. They have been recognized as a special class of political actors who display common attributes, deploy common strategies, and can propel dynamic shifts. These individuals use innovative ideas and non-traditional strategies to promote desired policy outcomes. Whether they come from the private, public or third sectors, one of their defining characteristics is their willingness to invest their resources in the hope of potential. Agenda setting is a crucial part of policy entrepreneurship, as successful policy entrepreneurs invest a great deal of effort in garnering attention for their proposed policies (Cohen, 2016).

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<sup>1</sup> There is a myriad of interpretations and expansions of this policy cycle model, which shall include other stages, such as problem-identification and decision making, only to name a few (United Nations Inter-Agency Task Team on Science, Technology and Innovation for the SDGs & European Commission, Joint Research Centre, 2021). For simplicity’s sake, in this paper we use this four-stage representation of the policy cycle.

However, as public policies result from decisions taken mostly by governments (Sabatier, 1999), necessary state capacities at this stage are precisely associated with how to improve the decision-making process, which may be understood as a process that necessarily requires political power.

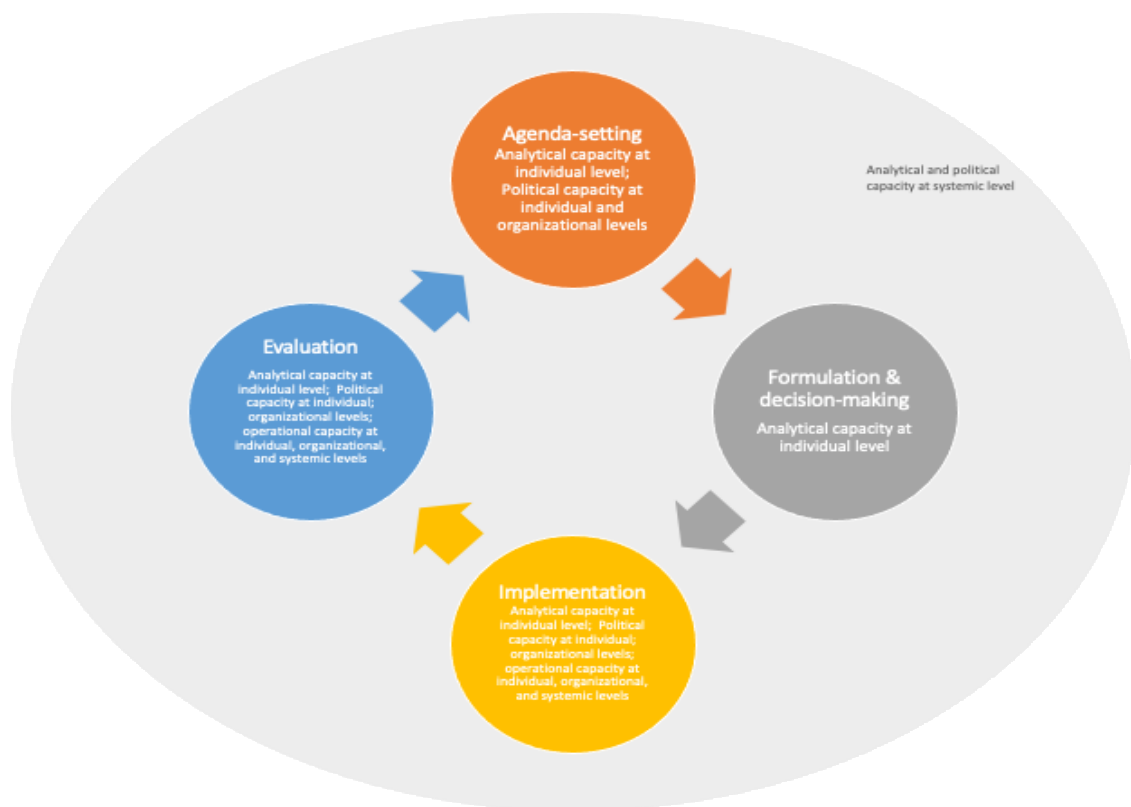
Once a policy agenda is in place, the stage of public policy formulation begins. In this stage, problems, suggestions, and demands are transformed into government programs. The formulation and adoption of policies include the definition of objectives and alternatives for action, as well as selection of suitable policy instruments (Jann & Wegrich, 2007). This stage is primarily constituted by the key roles of public administration (Page & Jenkins, 2005). Governments must be able to choose among possible alternatives to solve identified problems. In addition, organizational capabilities are required to mobilize a bureaucracy prepared to make decisions, to design policies that take different forms, and to improve practices within government, introducing ever more rational decision-making techniques and tools.

Next, policy implementation can be defined as the step that occurs between the establishment of an apparent intention by the government to take action or cease some activities, and the ultimate impact stemming from such decision through concrete actions (O'Toole, 2000). Public authorities are the most important actors during the first stages of the policy cycle. Thus, the importance of developing the capacities necessary to establish fruitful partnerships with other socioeconomic agents (see 4.1.2), particularly from the business sector, towards the achievement of intended policy goals. According to Sabatier, (1999), the implementation of any public policy results from rules defined by political actors and high-level bureaucrats, but that should be adapted by the so-called street-level bureaucracy, which has its actions constrained by historical, socioeconomic and political singularities of the context in which the policy is being implemented. Accordingly, states need both analytical and operative capacity during this stage of the process.

The evaluation stage entails analyzing and verifying the implementation of programs, projects, and policies, as originally designed to tackle social problems. Evaluating entails choosing measures, parameters, and metrics and how to use and compare policy outcomes, relative to intended goals defined at the policy design phase, and whether they have been achieved in the most effective and efficient way possible, considering the limitations faced by those implementing them. Lessons learning through policy evaluation is essential for governments to improve effectiveness and accountability. Evaluation also indicates how to correct and improve policy to achieve desired results and, therefore, government success in that area. During this stage, not only analytical capacities are needed, so that proper evaluation and policy improvements and adaptations can be done over time, but also political capacities to later decide to proceed with or discontinue a policy implementation.

The preceding discussion suggests opportunities to embed a more explicit understanding of the types of capabilities and actors involved (Figure 1) in the notion of policy cycle. Hence, it should be easier for those interested in supporting the strengthening of policymaking capacities to identify where the main gaps lie, either among individual policymakers, public organizations, or even at the macro-level of institutions. In effect, there is strong potential to use such an approach to understand needs and possible remedial solutions from a development perspective.

**Figure 1. Towards a better understanding of policy capacities across stages of the policymaking cycle**



Source: Author's own elaboration

### **3. Policy capacity and industrial development: A synergetic relationship**

#### **3.1. Investing in industrial capabilities is not enough**

Recent contributions to the literature highlight concerns regarding the slow pace of industrialization in several developing countries. Their share of low-income economies in world manufacturing output continues to shrink, from 0.6 per cent in 1990 to 0.4 in 2021, while that of industrial economies stood at around 91 per cent in 2021 (UNIDO, 2022). With the exception of a handful of dynamic middle-income economies, particularly in Asia, the industrial development



gap continues to widen (UNIDO, 2022). Structural deficiencies in policy capacity tend to exacerbate the negative effects of missing industrial capabilities in developing countries.

Industrial development - broadly understood as a process of structural transformation of an economy from low to increasingly higher productivity activities - is a complex, cumulative process, which involves investment in the development of and continuous improvement of different kinds of industrial capabilities. From skills embedded in people to perform increasingly complex productive tasks, develop new technologies and design new products, through organizational capabilities to effectively organize production, and institutional factors such as the extent of market rule, regulation, or the observance of property rights.

Industrial capabilities allow developing countries to create windows of opportunity to achieve technological and productive catch-up (Lall, 1992; Lee, 2019). Conversely, the role of changes in institutions and public policy in both creating and conditioning the ability to tackle windows of opportunity, and in explaining successive industry leadership changes, has been documented in the literature (Lee & Malerba, 2017). The nature of industrial policy, along with the associated policy capacities, has the potential of triggering changes in technological capabilities and concomitant strategic modes of capability accumulation by firms. (Li & Wang, 2021)

Investing in industrial capabilities is a necessary but insufficient condition for success (Ohno, 2012). Developing countries face the daunting task of mobilizing, coordinating, and even creating the necessary resources to address pressing industrial development challenges. This often requires the introduction and management of incentives that facilitate the convergence of behaviours and strategies of diverse economic agents. Practices that regulate land tenure, the nature of mechanisms to assign and protect intellectual property rights (IPRs) and other idiosyncratic and cultural factors influence the direction and pace of industrialization (Santiago, 2015).

Successful industrial policy implies more than making choices between general and selective support to activities with the highest payoff potential, but involves a dynamic decision-making process that changes over time, in line with the accumulated productive and technological structures of countries and economic entities within (Park et al., 2021). Industrial policy enables governments to shape industrialization by supporting or speeding up development of industrial capabilities, thereby steering change in productive structures in desired directions. At the base of these processes there is the formation of state institutions, governance and bureaucracy structures, and their interaction with other powerful organisations and interest groups, which influence resource allocation, priority setting and the negotiation and achievement of compromise around desirable development outcomes (Andreoni & Chang, 2019). These distinct institutional forms of

organizing industrial activities also help to explain differences in how costs and benefits accrued from such activities are allocated across societal groups (Srinivas, 2021).

Governments have the ability to trigger changes in the system underpinning industrialization. The presence of appropriate policy frameworks and conducive institutions are indispensable for this. Institutions with a mandate in industrial development require building and strengthening their ability to devise policy, thereby leading to Andreoni & Chang's (2019) proposition on the historical, mutually supportive relationship between state formation and industrialization.

However, a deterministic interpretation on the role of the state in guiding industrial development should be avoided. Ohno, (2012) argues that steady progress towards prosperity requires policy makers to acquire the necessary capacities to formulate policy suitable for local contexts, drawing lessons from history and international experiences. While developing country governments can be both initiators and orchestrators of “national transformation in mindset, technology, and industry” (p. x), they often lack skills, competencies, capacities, and capabilities to fulfil such a role (Willian, 2012; Hudson et al., 2019).

Supporting the creation and strengthening of policy capacities is challenging in resource-constrained developing countries, which often lack the ability to define goals and balance priorities, in ways consistent with the country's context, history and accumulated productive capacities, thereby curtailing progress towards industrial transformation. The heterogeneous economic structure of developing countries - a mix of ‘traditional’ and ‘modern’ manufacturing activities co-exist - translates into a complex environment to design, implement, and reassess innovation and industrial policies (Ohno, 2012).

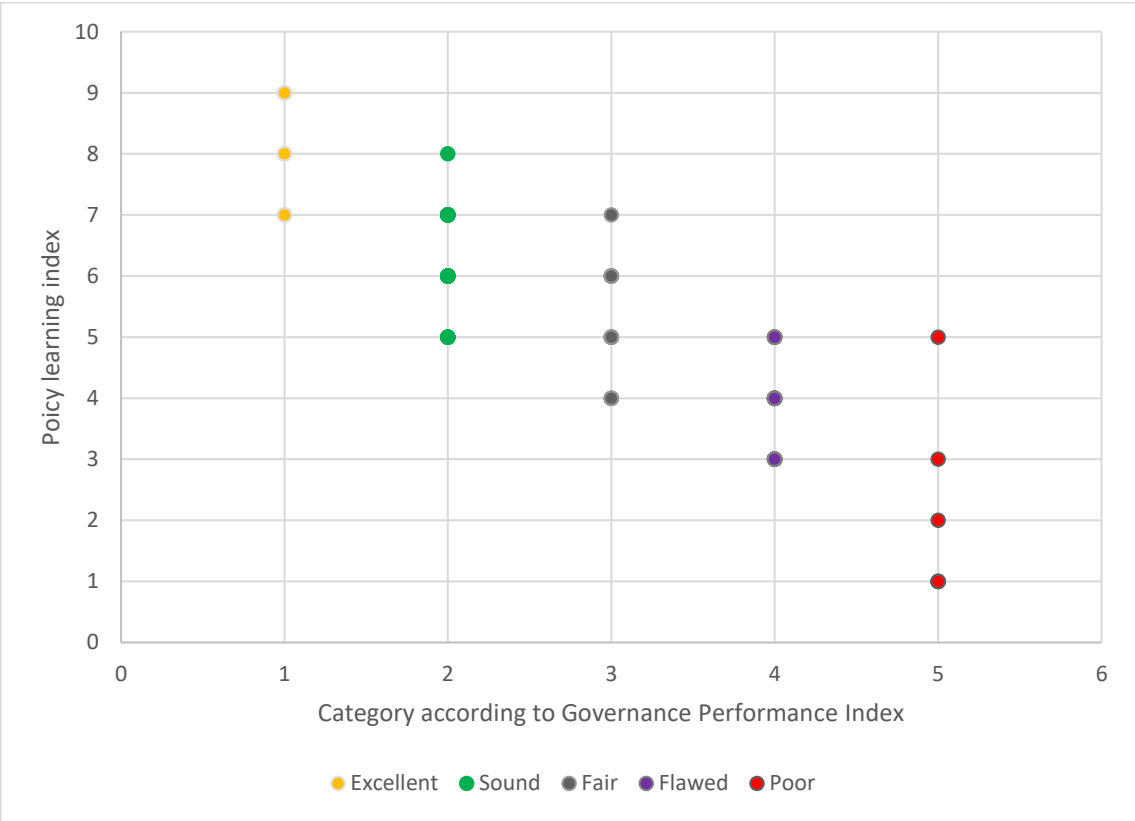
### **3.2. The link between policy capacity and industrial performance**

In addressing policy capacity gaps, an immediate challenge that emerges is that while policy capacity is a fundamental concept in public policy discussion, there is disagreement over its definition, which is followed by controversies on how to operationalize and measure it (Wu et al., 2015). The diversity of concepts of policy capacity can be explained through the different theoretical and empirical contributions to the literature.

For illustrative purposes, in this paper we proxy the notion of policy capacity through that of policy learning (Bertelsmann Stiftung, 2022). For simplicity's sake, policy learning encompasses systematic processes that include, among others, effective monitoring and evaluation to draw lessons from past experiences and the ability to observe and engage in knowledge exchanges to enhance awareness and understanding of good practices in policymaking (Bertelsmann Stiftung,

2022). Policy learning provides governments with the necessary flexibility to modify a set course of action and implement innovative solutions to policy problems. Policy learning takes place through interactions with academic experts and practitioners via consultancy or broader professional services. By engaging in international cooperation and knowledge-sharing activities, governments can gain useful insights to improve their policymaking processes (Bertelsmann Stiftung, 2022).

**Figure 2. Policy learning and governance performance, 2018**

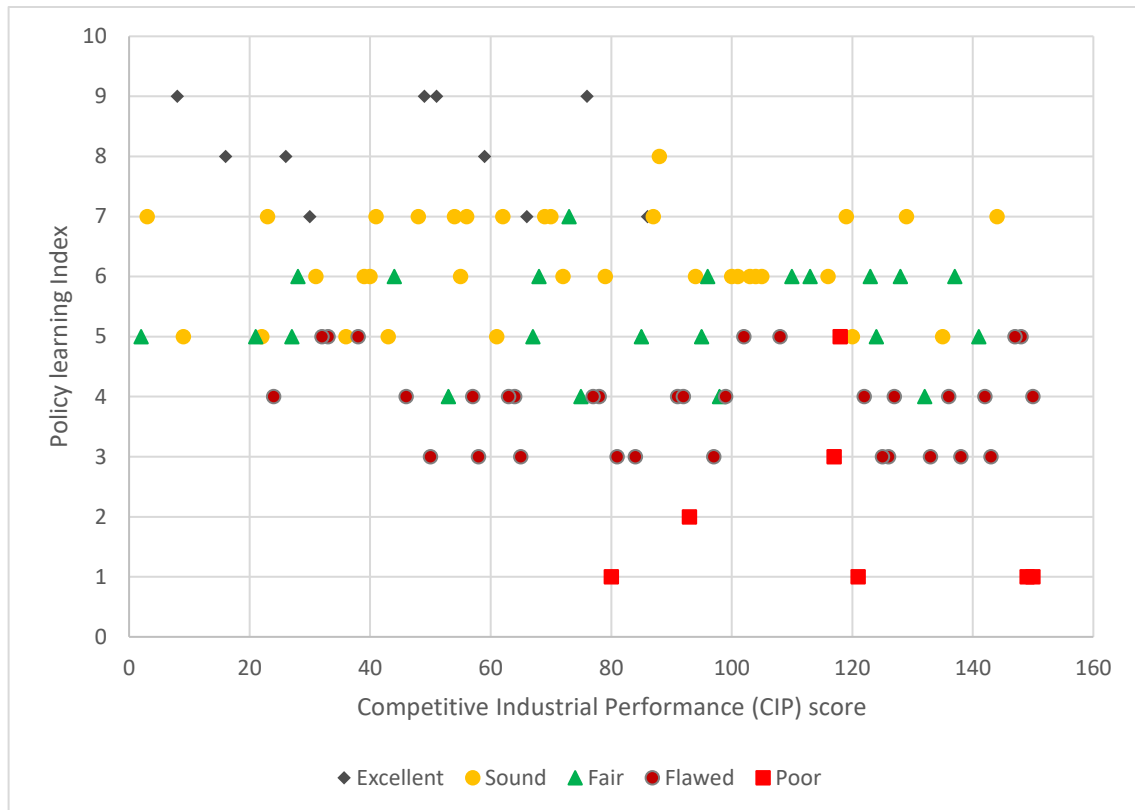


*Note:* Includes 106 developing countries or former economies in transition. Rating scale for Policy Learning Index ranges from 10 (best) to 1 (worst). The Transformation Index Bertelsmann Stiftung’s Transformation Index (BTI) is a national-level survey of political and economic transformation, which measures democracy, inclusive and sustainable market economy, and good governance.

Source: Authors, based on Bertelsmann Stiftung’s Transformation Index (BTI). (BTI, 2022)

The importance of policy learning emerges from the fact that developing countries and former transition economies that engage in active policy learning tend to outpace others in terms of governance performance (Bertelsmann Stiftung, 2022) (Figure 2). Among others, policy learning demonstrates a country’s ability to establish and steer policymaking in certain directions, allocate resources efficiently, and/or engage in meaningful collaborations, both domestically and internationally.

**Figure 3. Policy learning and industrial competitiveness, 2018**



*Notes:* Includes 106 developing countries or former economies in transition. Rating scale for Policy Learning Index ranges from 10 (best) to 1 (worst). The Transformation Index Bertelsmann Stiftung's Transformation Index (BTI) is a national-level survey of political and economic transformation, which measures democracy, inclusive and sustainable market economy, and good governance.

*Source:* Authors, based on Bertelsmann Stiftung's Transformation Index (BTI) and UNIDO's CIP Index.

From an industrial policy perspective, policy learning and strong governance tend to also correlate with industrial competitiveness, as measured by UNIDO's Competitive Industrial Performance (CIP) Index (UNIDO, 2020a). Figure 3 shows most countries that are characterized as active policy learners outperforming others in terms of policy governance also tend to rank higher in the CIP Index.

### ***3.3. Policy capacity and catching up in the Republic of Korea***

Over the last few decades, only a few countries have been able to catch up with more developed countries (Cherif & Hasanov, 2019). The case of East Asian countries, such as the Republic of Korea (RoK) and Taiwan, Province of China stand out in that regard. Strengthening capacities in RoK has played a crucial role in a cumulative long-term development trajectory in opposition to short-term growth during the second half of the 20<sup>th</sup> century (Lee, 2009; Lee & Lee, 2008). The analysis of the RoK case illustrates the importance of having constantly enhancing analytical, operative, and political capacity at different levels through the catching up process.

Beginning at the individual level, RoK's success is underscored by a commitment to constantly enhancing analytical skills. The regular migration of engineers from state-owned enterprises (SOEs) to private companies serves as a crucial mechanism fostering knowledge spillovers and disseminating production capabilities (Park et al., 2021). At the organizational level, RoK's government not only improved the organizational capacity of bureaucrats but also enriched institutional conditions, fostering coordination and communication between public and private agents in the realms of industrialization and technological development. Systemically, the Korean government recognized the importance of partnerships beyond public bodies, emphasizing closer ties with the private sector (Mazzucato, Qobo, et al., 2021), evident in the creation of export promotion and technology promotion mechanisms. (Park et al., 2021; STEPI (Science & Technology Policy Institute), 2017)

At the individual level, bureaucrats were not merely participants but were actively trained to improve their technical and engineering knowledge, aligning with the dynamic demands of the private sector. Operationally, there was a focus on improving the working conditions within public administration and coordinating efforts between governmental and non-governmental actors.

RoK's success story is not merely analytical and operational; it is intricately tied to political capacity too. At the individual level, the role of the President of RoK in chairing committees, along with the pursuit of strengthening ties with the private sector, aligns with the 'embedded state' ideal type of developmental state (Evans, 1995). Policies at the organizational level were complemented by direct incentives, mitigating risks for local companies in government-led industrialization efforts. Systemically, constant improvements in both analytical and organizational capacities were associated with a strategy of permanent alignment and review, ensuring compatibility with the country's broader development strategies (Park et al., 2021).

RoK was successful in building both operational and analytical capacities. One of the country's particularities was the fact that the government had, since early stages of the country's catching up, invested both in basic education and technical qualification of professionals who would be equally able to work in either the private sector, or in the public sector. Bureaucrats were trained to improve technical and engineering knowledge, in line with the demands imposed by the private sector.

This effort to improve state capacities proved to be a fundamental strategy for the country to achieve its productive catching up and technological leapfrogging, which made RoK one of the most innovative countries in the world. Evidence of this is that if between the 1960s and 1970s all three of its main exports were primary goods or simple consumer goods, since the 2000s the country has mainly produced highly technological goods, such as cars, semiconductors, and petrochemicals.

#### **4. Addressing a challenging future**

The outbreak of COVID19 has shown the potential power of manufacturing in handling unexpected shocks and for building economic resilience. Differences in productive capacities across countries help to explain the distinct ability of countries to withstand unexpected shocks, and the distinct paths to recovery each of them can follow (UNIDO, 2021). The disruptions to manufacturing and supply chains worldwide causing shortages of essential medicines and equipment also revealed fundamental weaknesses and inequalities within the global economy amplified by the pandemic, such as uneven growth, unequal access to healthcare and a growing digital divide (UNIDO, 2021). Post-pandemic recovery introduces pertinent considerations for the future of industrial policies. There is scope to build notions of resilience into industrial policy so that it contributes to reduced exposure and vulnerability, to manage and respond to disasters, especially in hard-hit low and middle-income countries (López-Gómez & Santiago, 2022; World Bank, 2020). The challenge is to turn such crises into windows of opportunity, to further sustainable and inclusive industrialization (Santiago et al., 2020; UNIDO, 2021).

A broad-based role of industrial policy is consistent with the global agenda around the Sustainable Development Goals (SDGs), and particularly SDG9, which underscores the importance of industrialization, innovation and resilient infrastructure (UNIDO, 2020b, 2023a). Alignment with the United Nations 2030 Development Agenda and its SDGs may mean that opportunities to accelerate sustainable industrial transformation in developing countries exist (United Nations, Inter-agency Task Force on Financing for Development, 2023). SGD-oriented industrial policies should drive long-term prosperity, provide government interventions a sense of purpose and a direction towards delivering win-win-win solutions, simultaneously balancing growth, environmental and social concerns (UNIDO, 2016, 2023a).

The expectation is that the new generation of sustainable industrial policies effectively reconciles national interests, regional coordination and collaboration as well as international governance around industrialization (Aiginger & Rodrik, 2020; UNIDO, 2023b; United Nations, Inter-agency Task Force on Financing for Development, 2023). No country acting in isolation can effectively address the ongoing challenges shaping the trajectory of industrial development (UNIDO, 2023b).

However, novel approaches to the formulation of industrial policies underpinning the required industrial transformations necessitate appropriate policy frameworks and capable policymaking institutions. The United Nations Inter-agency Task Force on Financing for Development, (2023) advocates government institutions with a mandate in industrial development to build on existing capacities and stride to mitigate against existing constraints. Further, the document advises governments, particularly those at low levels of capacities to strengthen their ability to engage in increasingly complex industrial policymaking processes. This implies abating the scope of policy failure by minimizing the number of components of a specific initiative or policy package, by focusing on key binding constraints, or by adopting some sort of phased, step-by-step policy approaches (United Nations, Inter-agency Task Force on Financing for Development, 2023), thereby granting some necessary room for policy experimentation and learning, which may help to smooth policy capacity building processes. Hence, policy learning plays an increasingly crucial role in capacity development processes that support industrialization, particularly in developing countries.

#### **4.1. Identifying policy capacity gaps in developing countries**

##### ***4.1.1. Policy capacities for evidence-based policymaking***

As discussed in Section 2.2, governments face increasing pressures to deliver effective and efficient public policy in a growingly complex and unpredictable environment around industrial development. Evidence is a key ingredient for all the different components of the policy-making process, as it can play a crucial role in designing, implementing, and delivering better public policies. However, effectively connecting evidence and policy making remains a challenge, particularly for developing countries where insufficient skills and capacities at the individual policymaker level, operational bottlenecks in poorly endowed government organizations, and institutional gaps at the system level tend to be more evident than in more advanced economies (OECD, 2020).

The ability to gather and utilise evidence as the basis for policy making often requires trust-building by decision makers together with new skills and competences at all levels of the public sector. Policy capacity is strengthened when policy makers use evidence in policy and practice, when they can integrate insights from stakeholders, and implement policies adapted to local behavioural dynamics (Colebatch, 2018; OECD, 2020). Policy capacities reflect also policymakers' ability to use evidence to inform and enrich public governance, and to attain policy goals through the use of networked approaches, problem solving and integrated solutions (Colebatch, 2018; OECD, 2020). Hence, evidence-based policy making is essentially a method for both determining “what works,” and “what makes policy happen” for ensuring policy delivery (Parsons, 2007).

At the individual policymaker level, it is possible to improve public servants' skills for adopting more evidence-based policy analysis. For instance, in 2005 the United Kingdom created the Civil Service College and the Centre for Management and Policy Studies (CMPS) – later called the National School of Government, a program for civil servants on policy management. It offered courses on topics such as the development of deliverable policy, economics for policy making, evaluation of programs and policy for practitioners, introduction to evidence-based policy making, making policy that happens, the policy environment, and risk analysis in the policy area (Parsons, 2007). Although the programme was discontinued in 2012, 90% of participants in the programmes provided by the School evaluated the events as being “effective” or “highly effective” in meeting its stated learning aims and objectives (National School, 2011).

Despite the potential benefits expected to emerge from evidence-based policy making, public servants in developing countries may lack the necessary ability to engage, discern and act based on evidence, an issue that is particularly difficult when such evidence is derived from scientific and technological sources (Rabadán-Diehl, 2017). Sutcliffe & Court, (2006) and Saguin et al., (2018) identify deficiencies in analytical and managerial competence that result from the lack of performance management, or the dearth of a consistent culture of evidence gathering for monitoring and evaluation.

There is a tendency to outsource key policymaking decisions without due consideration for the learning and accumulation of policy capacities that go with policy development (Althaus et al., 2021). This may exacerbate the knowledge and skills gap of public officials responsible for industrial policy making relative to the development challenges confronted by domestic industrial activities. Outsourcing policy making capabilities may also fail to propel ownership by the Government and the multi-stakeholder processes required to achieve buy-in of stakeholders, particularly in the private sector (Althaus et al., 2021).



Other constraints result from the lack of political competence, namely openness to evidence gathering and multi-stakeholder consultations and participation; awareness of the extent to which government accountability is a relevant input for policy design and performance; and relative imbalance between analytical, managerial and political skills (Newman et al., 2017). Without these competences policy makers are unable to coordinate the actions of different actors within government and collaborate with actors outside of government for industrial policy making.

A dramatic illustration of this capability gap is the recent COVID19 pandemic, which plunged policymakers worldwide into a context where decision making took place amidst a situation of a rapid generation of new evidence. However, the established scientific and technological systems did not respond with corresponding speed to validate and disseminate the new knowledge required to inform decision making (Santiago, 2021). Government officials were confronted with the challenge of mobilizing support tools whose design and operation failed to fit the needs of emerging research fields that incorporate novel, often digitally-based sources and methods for data analysis, or validation of knowledge outside of established standards (Rovenskaya et al., 2021). The diversity of areas affected by the pandemic suggests the relevance of strengthening the professionalization and capacities of public officials to access, interpret, validate, and act on emerging evidence and high levels of uncertainty.

In the case of developing countries, the situation described above can be explained, at least to some extent, by system-level limited investments in science, technology and innovation (STI), and insufficient efforts to systematically mobilize science and technology policies as part of strategies to foster development. Strengthening of individual, organizational, and systemic capabilities to enhance the interface of STI capabilities and STI policy capacities is necessary to create synergies between industrialization and technological capability-building. Hence, developing countries may be better positioned to tackle emerging crises, to try and transform unexpected shocks into windows of opportunity for catching up with more industrialized economies (Park et al., 2021), and to foster more inclusive and sustainable development (Santiago et al., 2020).

The emergence of the Fourth Industrial Revolution (4IR) characterized by a deepening in digitalization, technological convergence and structural transformations in global manufacturing further exacerbates the need to articulate STI and industrial development strategies, while opening opportunities for turning policy-making ‘smarter’ (Chang & Andreoni, 2020). Taken together, these issues have brought renewed interest in the role of policy learning and capabilities building in development processes.

The preceding discussion suggests a few elements needed to increase developing country governments' capacity for an evidence-informed approach to policy making. First, they need to invest in skills for the use of evidence by the bureaucracy. This entails strengthening the professionalization of public officials, including capabilities to access, interpret, validate, and act on emerging evidence and high levels of uncertainty. Second, it should be possible to more systematically assess the socioeconomic impacts that can be associated with public policy interventions (Casas & Mercado, 2016; Dutrénit et al., 2018) thereby improving the evidence base available to substantiate policy learning about initiatives that work, and those that don't, and the reasons for this. Third, governments require systemic and institutional approaches by strengthening organizational tools, resources and processes, investing in basic infrastructure, including data management systems and knowledge brokers and establishing strategic units (OECD, 2020). Finally, there is a need to invest in dynamic capabilities so that governments strengthen their ability not only to allow more effective responses, but also create the conditions for tackling emergencies such as those resulting from the pandemic (Mazzucato et al., 2021).

#### ***4.1.2. Policy capacities to handle distributed policy-making processes***

The discussion thus far has underscored the central role of government entities as the main agents in the formulation, implementation, and evaluation of industrial public policies. The absence of essential policy capacities raises concerns, particularly given the increasing complexity of the issues in hand. This underscores the importance of fostering the participation into the policymaking process among a broader set of actors with the ability to articulate interests, formalize claims and convert them into initiatives, prescribe and promote solutions, or prevent decisions from being implemented (Santiago & Komendantova, 2022). Non-government organizations (NGOs), international organizations, academia, and the private sector should play central roles in policy design, implementation, adjustments, and evaluation, contributing therefore to a more comprehensive and effective decision-making landscape.

The literature highlights 'multiple helix' approaches involving multi-stakeholder, participatory processes and the contribution of public-private dialogue to policy design and implementation as the basis for policy-making (Santiago & Komendantova, 2022). However, the challenging nature of consultative approaches should not be underestimated. They demand novel and increasingly complex ways to organize, govern and sustain such participatory processes (Dutrénit & Natera, 2018), to address conflict and to follow up on commitments during policy implementation.

Mazzucato, Qobo, et al., (2021) reiterate the fundamental role of partnerships to enable investment and innovation. They argue that given limitations on policy capacity, particularly in developing countries, governments alone will not be able to solve all challenges faced by their countries, even with the best of intentions. Capability-building requires a search for complementarities and partnership across various social sectors, such as the private sector, trade unions, and other representatives from civil society. Partnership building capacities become strategic, as they are compatible with efforts to address multidimensional problems through public policy.

Governments' role in partnership building would entail coordination, planning, and guiding the socioeconomic dynamics towards a sustainable economic growth pattern. Governments should indicate desirable directions, through various policy options, that would allow other socioeconomic actors to explore and exploit existing and new economic and technological potentials (Mazzucato, Qobo, et al., 2021). To ensure that these partnerships bear fruit, governments also need to establish long-term goals, create means, and mobilise or attract the necessary resources to put them in practice. This implies, for example, defining ambitious goals, or 'missions' to solve societal challenges and create 'value' for society. This 'mission-oriented' approach to policy making is more than top-down planning by an overbearing state. Rather, it is about a state that provides possible directions for growth, "increasing business expectations about future growth areas and catalysing activity - self-discovery by firms - that otherwise would not happen." (Mazzucato et al., 2021, 4).

Based on a study on capacity building through cross-sector partnerships in Belgium, Marlier et al., (2015, 5) present some telling results. At the individual level, two key elements of cross-sector partnerships were identified to build capacity: process evaluation and trust. Process evaluation means ensuring continuous assessment of the mutual activity so that partners can continuously adjust actions accordingly. Trust refers to the mutual confidence in the abilities and intentions of partners, so that higher trust leads to more knowledge and skill-sharing among partners.

At the organizational level, two other elements stand out to foster partnership building: mutuality and resources. Mutuality entails the interdependence of the partners so that the larger the interdependence and the perceived need to collaborate between the partners, the larger the willingness to share human, financial and infrastructural resources. Furthermore, (Marlier et al., 2015) show that partnerships could be more successful if individuals verified greater resources destined for the implementation of a given measure.

At the systemic level, Marlier et al.'s (2015) work highlights the importance of diversity of activities under the scope of partnerships between different players, so the larger the number of activities, the higher the ability to attract more partners to a network. Complementarity and fit between partners also seem to enhance capabilities through cross-sector partnerships, as it is associated with the composition of network partners and the harmonization between them (Marlier et al., 2015). Althaus et al. (2021) stress networking and partnership building as factors that justify the outsourcing of policy consultants for enhancing government policy capabilities. Understanding how developing countries can expand and enhance engagement with multi-stakeholders can be an interesting strategy for strengthening policy capabilities, including for industrial policy.

## **5. Conclusion**

The emerging post-pandemic world presents new opportunities for industrialization while also bringing new and progressively intricate challenges for manufacturing development, particularly in developing countries. Several advanced economies are bidding hard on manufacturing as a driver of social and economic transformation while geopolitical and global manufacturing leadership are also at stake. At the same time, there is consideration of the rapid pace of technological change, and the pressures to progress in broader aspects of economic, social and environmental sustainability issues, in line with the agenda of the SDGs.

In this paper, we acknowledge that industrial policymaking does not occur in a vacuum. Underpinning industrial policy decisions there is a host of policymakers, government entities as well as societal practices and institutions that give direction and grant legitimacy to policy decisions and their outcomes. (Sabatier, 1999; Santiago & Komendantova, 2022)

The different trends observed around manufacturing development are raising the levels of capabilities – as a set of skills, experience and resources - required both by manufacturing firms and by those responsible to formulate, implement and follow up on policies intended to address an ever increasing set of development opportunities and challenges. In a changing environment, those skills, resources and experiences need regular updates and upgrades. Policymakers face demands for new sets of skills, resources and experience, to engage with and act based on – often inconclusive - evidence, while creating spaces for otherwise vested interest groups to converge and build minimum consensus around policy problems and possible initiatives to solve them (Dutrénit & Natera, 2018; Mazzucato, Qobo, et al., 2021; Santiago & Komendantova, 2022). This is, in essence, the motivation for our interest in policy capacity, and in particular, policy capacity development.

Although all countries face challenges when it comes to strengthening policy capacity, developing countries tend to struggle the most. Based on a substantive literature review, in this paper we have identified suitable frameworks to capture the complexity of the processes that policymakers are likely to confront when devising strategies to address industrial development challenges. The framework reconciles research on policy capacity with commonly accepted wisdom around the policymaking cycle as a good approximation to the complex policymaking process. Each stage in the policy cycle – agenda-setting, formulation, implementation, and monitoring and evaluation – would be associated with different sets of technical, operational, and political capacities across different levels of action, either by individual policymakers, government entities or national level institutions. This reasoning should consider not only static but also dynamic dimensions of policy capacity.

At the same time, this holistic approach offers opportunities to better frame and target development initiatives to foster policy capacities for industrial policymaking in developing countries. Based on our literature review, policymaking gaps can emerge at different levels, either among individual policymakers, public organizations, or even at the macro-level of institutions, practices, and approaches to policymaking across countries. There is ample scope for research seeking to translate those scholarly tools into useful instruments to guide capacity development for policymaking and, as expected in the literature, public sector innovation as the basis for identifying creative solutions for complex development problems (Kattel & Mazzucato, 2018; UNIDO, 2023a; United Nations, Inter-agency Task Force on Financing for Development, 2023).

Regarding the second research question in this paper, the brief account of the experience of the RoK corroborates the central importance of the development of policy capacity for the success of industrial development. The experience of the RoK serves as an example of a country that managed to catch up through a process of structural change that took place in three stages – technology introduction, internalization, and creation. In each of these stages, analytical, operative, and political capacities at individual, organizational, and systemic levels were adapted to the objectives to be achieved. Moreover, government planning involved paying attention not only to agenda-setting and formulation of industrial policy but also to implementation and evaluation, which was done in a dynamic way, as it entailed constant examinations and adjustment as part of the policy learning process. An important strategy for making this possible was the development of an embedded state, which both invested in improving analytical and operative skills of bureaucrats and in nourishing strong connections to private sector's representatives, to ensure the efficacy of policymaking.

The analysis of these cases indicates that countries willing to catch up in the 21<sup>st</sup> century will need to improve their analytical, operative, and political capacity at individual, organizational, and systemic levels. This must be done by implementing holistic development planning, which needs to consider all different stages of the policy cycle through a dynamic approach that prioritizes both formulation and implementation and monitoring and evaluation. Policy experimentation and policy learning emerge as key concepts to consider in strategies to tackle the complex industrial development challenges emerging in a post-pandemic world.

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