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Chapter

Innovation and Global Sustainable Development: What Role for Development Banking?

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Abstract

This chapter explores the potential role of development banks in fostering innovation within the context of sustainable development, considering their explicit mandates and collaborations with governments. Development banks are argued to play a pivotal role in supporting innovation by providing substantial financial resources to projects that address the complex challenges outlined in the Sustainable Development Goals (SDGs) while ensuring the preservation of natural resources for future generations. A critical review of economic literature examines the characteristics of development banks that enable them to fulfill their social mandate, including their expertise and ability to mobilize private finance. Collaboration with governments and risk mitigation for private investors are highlighted as means to facilitate the achievement of the SDGs. However, challenges associated with public intervention and state-owned enterprises, such as political opportunism and crowding-out of private sector investment, are acknowledged. By reviewing the literature, describing recent developments, and presenting empirical evidence, this research provides valuable insights for policymakers, scholars, and practitioners to critically evaluate the potential and effectiveness of development banks in promoting innovation.

Keywords: development banks, sustainable development financing, sustainable development goals, innovation, market failures, political failures

1. Introduction

The present chapter aims to analyze the potential role played by a specific economic-financial actor, namely development banks, in the context of innovation. These financial entities receive specific mandates from governments to pursue medium- to long-term growth within a particular territory and support significant social and global challenges. The importance of these public mandates is particularly relevant considering the ambitious 17 Sustainable Development Goals (SDGs) established by the United Nations in their 2030 Agenda for Sustainable Development. Global Sustainable Development (GSD) refers to a conceptual and methodological framework that seeks to achieve long-term, equitable, and environmentally responsible development on a global scale. The Global Sustainable Development Report [1] identifies six key areas that serve as *entry points* for transformative action

in sustainable development: (i) enhancing human well-being and capabilities, (ii) promoting sustainable and equitable economies, (iii) transforming food systems and nutrition patterns, (iv) decarbonizing energy while ensuring universal access, (v) fostering urban and peri-urban development, and (vi) safeguarding global environmental commons. Additionally, it highlights four *critical levers* that must be strategically employed across these areas to drive the necessary transformations: governance; economy and finance; individual and collective action; science and technology.

These levers form the foundation of this chapter's contribution. Emphasizing the relevance of economic policies and financial flows to propel progress toward the SDGs, they underscore the indispensable role of substantial public finance and appropriate governance in bridging the investment gap related to SDG implementation. Indeed, these elements facilitate long-term investment decision-making and attract private capital toward the directions desired. Even if governments play a primary role in policy design and implementation, their effectiveness requires constant collaboration and knowledge-sharing with other key stakeholders such as the private sector, civil society organizations, and regional, multilateral, and international entities.

Within this context, *development finance institutions*, including public development banks at the multilateral, national, and regional levels, can play a pivotal role. These institutions can foster alliances between traditional and emerging actors, such as governments, universities, science institutions, cities, citizens, and the private sector. Simultaneously, they channel the necessary resources to effectively address the SDGs. By leveraging these alliances and resources, the collective effort toward sustainable development can be enhanced.

If governments want the development banks to successfully contribute to the SDGs, they must place science and technology at the core of their mandates. Indeed, it is essential that the innovation processes function within a coherent framework that aligns with the goals of the societies. In this context, innovation transcends its traditional role as a fundamental prerequisite for long-term economic growth. By enabling the implementation of new technologies, practices, and solutions, innovation can enhance productivity and incomes while preserving natural resources and minimizing adverse environmental impacts. In so doing, it shapes the technological frontier on which the well-being of current and future generations is determined.

In this context, the role played by development banks can be of paramount importance. On the one hand, by closely collaborating with governments, development banks can contribute to shaping policies that foster innovation in sectors and projects that align with the SDGs. On the other hand, by mitigating the perceived risk for private investors, development banks can stimulate and mobilize additional resources that facilitate the accomplishment of the SDGs. Development banks possess the capacity to provide substantial financial resources in support of innovation initiatives. They have the ability to extend loans, grants, and investment capital to innovative projects and businesses that prioritize sustainable development. Through facilitating access to funding, development banks can bridge the financing gap commonly encountered by innovative solutions and facilitate their implementation on a large scale. Furthermore, as their primary objective is oriented toward goals beyond profit maximization, development banks are more inclined to promote the adoption of sustainable technologies and practices that align with their public mandate.

Despite these challenging and socially meritorious objectives, development banks predominantly remain entities with public participation, thereby potentially subject to the problems and deficiencies that economic literature often identifies and highlights regarding public participation in the economy and state-owned enterprises. It is

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therefore essential to carefully consider the benefits and costs of the presence of public banks in the economy and assess whether the support they can provide to innovation is overall positive, even considering potential inefficiencies. Consequently, this contribution aims to examine the state of the art in the existing economic literature concerning the role that development banks can play in contemporary society and the economy, particularly in promoting innovation and the pursuit of SDG objectives. In doing so, it can serve as a potential reference for future research agendas on these topics.

The chapter is structured as follows. Firstly, Section 2 provides the historical and institutional background of development banks, aiming to clarify their nature, how their role has evolved over time, and the increasing emphasis on innovation. Subsequently, Section 3 introduces the economic fundamentals that can justify the presence and intervention of development banks in the economy. This section also briefly discusses potential inefficiencies arising from public intervention in the economy and explains how development banks may possess characteristics capable of mitigating some of these limitations compared to other forms of intervention. Section 4 presents concrete evidence of development banks' intervention in the field of innovation, referring to both empirical economic literature and specific case studies. In Section 5, an attempt is made to summarize the remaining open questions regarding the key determinants of the effectiveness of development banks in pursuing their objectives and, in particular, in supporting innovation processes aligned with the SDGs. These questions provide ample room for ongoing and extensive debate among policymakers and academics, as we will finally discuss in the conclusions of Section 6.

2. Historical and institutional evolution of development banks

Development banks can be defined as legally-independent and government-supported banks carrying out financial activities on a professional basis within an explicit legal mandate to promote socioeconomic goals and public policy objectives (see, for example, definitions available in [2–5]).

They include both *multilateral development banks*, operating at a supranational level, and *national banks*, operating at a national and subnational level. Among the prominent multilateral development banks, we can identify the World Bank Group, the African Development Bank, the Asian Development Bank, the Asian Infrastructure Investment Bank, the European Bank for Reconstruction and Development, the European Investment Bank, the Inter-American Development Bank, and the Islamic Development Bank Group. Their presence in the international financial landscape is extensive and continues to grow.

Furthermore, the number of national development banks is estimated to surpass 400 [3], collectively holding assets exceeding $5 trillion [6]. Notable examples include the China Development Bank, the Korean Development Bank, NAFIN (Mexico), BNDES (Brazil), KfW (Germany), AfD (France), and CDP (Italy). The significant presence of national development banks, spanning both emerging and advanced economies, underscores their growing relevance in the financial system. The European Union, for example, recognizes that the involvement of *national promotional banks* (a European synonym for national development banks) is necessary for the effective implementation of the European investment plans "due to their particular expertise and their knowledge of the local context, business, and investor communities as well as national policies and strategies" [4].

Development banks have played a significant historical role in facilitating economic growth, industrialization, urbanization, and development initiatives across nations. Mostly originating in the early nineteenth century as a response to the Industrial Revolution's demand for long-term capital, these banks initially emerged in Europe and North America to rectify market failures and foster infrastructure development. Supported or sponsored by governments, they played a vital part in financing pivotal infrastructure projects like railways and ports that were instrumental for industrial expansion. Moreover, following the Second World War, development banks played a significant role in post-war reconstruction efforts in numerous countries.

However, the majority of development banks existing today was established after the mid-twentieth century [3]. In this period, development banks assumed a more prominent role by actively supporting economic progress in developing nations during the wave of decolonization and the rise of newly independent states. These banks became crucial sources of financial resources for industrialization and infrastructure development, financing transformative ventures such as dams, power plants, and transportation networks that acted as catalysts for economic growth and modernization.

However, development banks maintain their importance in advanced economies, where they progressively adapted to tackle challenges arising from economic downturns and financial instability. Indeed, these banks have proven to be effective in playing a countercyclical role during periods of crisis, such as the Global Financial Crisis. Empirical evidence confirms the rising incidence of development banks on the total assets of the whole European banking system in the 2008–2009 recession period and during the 2011–2013 sovereign debt crisis [7]. In this period, they were increasingly tasked with providing crucial assistance to businesses facing limited access to liquidity and financing for investments. This role has further solidified in response to the recent global pandemic crisis [8].

Additionally, especially in developed countries, development banks have been increasingly tasked with addressing specific challenges related to inclusive and sustainable development. To this aim, their efforts increasingly align with the Sustainable Development Goals for 2030, including combating climate change and ensuring environmental sustainability with a focus on innovation in renewable energy sources and food security [2, 9–14]. CPI [15] indicates that climate finance constitutes a growing proportion of development banks' business activities, accounting for an average of nearly 30%. Development banks play a pivotal role in supporting high-risk ventures and act as catalysts for the much-needed financial resources to stimulate innovation, research and development, cutting-edge technologies, and vital societal initiatives such as climate finance [16–20].

Recently, development banks have undergone significant changes in terms of their interventions in the real economy. Many have made remarkable progress in supporting Small and Medium Enterprises (SMEs), resource efficiency, digital infrastructure, social housing, and education, highlighting their dynamic and transformative contributions to the economic landscape [7, 21, 22]. The importance of development banks and their ability to adjust their mission to meet evolving socio-economic needs can be better explained by studying the economic literature on public intervention in the economy. This literature provides insights into the economic reasons behind the existence of development banks, their potential shortcomings, and how they compare to other forms of public intervention in the economy. By examining this literature, we can gain a better understanding of the reasons why development banks can actively contribute to economic and social development.

3. Economic fundamentals of development banks: utility and potential weaknesses

The existence of development banks is justified by the theory of market failure, which recognizes the inability of idealized price-market institutions to sustain desirable activities or prevent undesirable ones [23]. Market failures occur when markets are inefficient and fail to reach the (Pareto-)optimal level of resource allocation, often due to factors such as imperfect information, externalities, or managerial biases [24–28]. The issue of information asymmetries, in particular, has been established as pervasive in financial markets, due to their high dependence on information [29]. Underinvestment in long-term projects with positive externalities can also arise as a consequence of the divergence between social and private returns [5] and the short-termism and high opportunity costs characterizing the private financial sector [30].

The establishment of development banks is only one of the different ways the state can intervene in the financial markets to overcome these failures [31, 32]. However, development banks are suitably positioned to provide solutions to inefficiencies and shortcomings within the economic system [2, 14, 16, 33]. Because of their peculiar characteristics, they are proved to be capable to provide *patient capital*, which is highly needed for strategic investments in infrastructure, export initiatives, housing, and socially impactful projects like climate finance, renewable energy, and food security [34, 35]. Furthermore, development banks actively engage in syndicate collaborations with private commercial banks, which can be attracted by their governmental connections and risk management expertise [2, 36, 37]. Risk mitigation measures employed by development banks include risk-sharing approaches and the preferred creditor status they typically enjoy, which often extends to financial institutions participating with them in syndicate lending. These measures enable development banks to attract private financing at a larger scale and facilitate *blended finance* programs, expanding their impact [38–40]. The Addis Ababa Action Agenda [41] defines blended finance as the combination of "concessional public finance with non-concessional private finance and expertise from the public and private sector". A group of nine development financial institutions[1] disclosed financing projects worth more than $11.2 billion through blending strategies in 2021 [42].

Contemporary development banks are recognized not only for their role in promoting efficient market functioning but also for their increasing emphasis in the *creation* of new market landscapes, fostering innovation, and improving institutional frameworks. Indeed, these banks facilitate responses to global challenges that require strong collaboration between private and government entities. They particularly support high-risk projects in sectors like high-tech, emerging industries, start-ups, and research and development (R&D) investments, which typically face major obstacles such as information asymmetries, evaluation difficulties, lack of guarantees, and limited track records [33, 43].

While it is widely acknowledged that development banks play a crucial role in addressing market failures and fostering socially beneficial endeavors, however it remains a critical question whether they are the optimal entities to pursue these

[1] These nine institutions include: the International Finance Corporation, the African Development Bank, the Asian Development Bank, the Asian Infrastructure Investment Bank, the European Bank for Reconstruction and Development, the Association of European Development Finance Institutions, the European Investment Bank, the Inter-American Development Bank Group, and the Islamic Corporation for the Development of the Private Sector.

objectives and what weaknesses may undermine their effectiveness. Development banks not only receive specific mandates from the governments, but they are also predominantly state-owned. This raises the question of whether development banks can give rise to concerns similar to those typically associated with state-owned banks. Indeed, potential weaknesses in the operations of state-owned banks should not be overlooked.

State-owned banks, often viewed as less efficient and profitable compared to private banks, have faced criticism due to their management by political bureaucrats. Undesirable consequences such as resource misallocation and value erosion can arise due to political interference and inefficiencies [44–49]. The misallocation of funds by state-owned banks can be attributed to two main hypotheses: the *soft-budget constraints* hypothesis and the *rent-seeking* hypothesis. The former posits that abundant and lenient capital access leads state-owned banks to approve poor investments and use public funds to bail out failing companies [44, 50]. The latter posits that politically connected entrepreneurs receive preferential treatment in terms of interest rates and credit accessibility [48, 51–54]. Influence from incumbent policymakers on state-owned banks to excessively stimulate economic growth before elections further complicates matters. Indeed, the decisions and actions of policymakers can have a profound impact on the operational dynamics of development banks, potentially influencing their lending practices, investment decisions, and overall effectiveness [55]. This issue is strictly related to the theory on political business cycles, which explores the political factors shaping macroeconomic fluctuations [56].

All these matters are clearly relevant to the debate concerning the appropriateness of development banks in addressing market failures and the conditions under which they are beneficial, as well as the existence of alternative approaches. However, it is essential to recognize that previous literature often treats state-owned banks as a homogenous category, despite the substantial differences in mission, business models, activities, and target market segments that characterize development banks. Unlike commercial state-owned banks, development banks typically receive a clear mandate to provide long-term capital for promoting innovation and sustainable growth and, consequently, possess specialized expertise within their areas of operation.

Development banks can mitigate political pressures and disrupt the intertwined relationship between state-owned banks and politics through various factors. One notable factor is the divergence in timelines between the investment cycle of development banks and the electoral cycle. While political opportunism often leads to a short-sighted and immediate focus on gaining political advantages during electoral periods, the existence of long-term objectives requires a foresighted perspective in the financing and implementation of relevant projects [2]. Given the complexity of long-term projects and their limited flexibility for abandonment or modification, achieving political objectives through lending activities becomes more complex in the case of development banks. Moreover, most development banks typically concentrate their interventions in predetermined sectors, industries, or geographical areas, consistently with the statutory mandate they received. This targeted and tailored approach reduces the scope for discretion, political opportunism, and resource misallocation. Additionally, development banks are called to mobilize private resources and expertise and to act as a catalyst to channel these resources toward desired sectors and projects [40, 57]. This emphasis on private co-financing further diminishes the likelihood of politically motivated lending toward non-viable projects, since these would lack support from private investors. Last but not least, due to their role in public-private collaboration, development banks are in a favorable position for

observing (and dealing with) both market failures and government failures at the same time [58].

Through these means, development banks attenuate political influence, safeguard against resource misallocation, and enhance project alignment with sustainable economic and social objectives. From this perspective, the focus of development banks on long-term investment themes yields dual benefits. On the one hand, it addresses credit deficiencies arising from market failures, particularly during specific cyclical phases (e.g., post-global financial crisis deleveraging). On the other hands, it restricts the autonomy of development banks, shielding them against short-term political opportunism and electoral cycles. With these necessary premises established, we can now proceed to discuss the empirical literature on the intervention of development banks in the realm of innovation. This discussion encompasses references to both empirical economic literature and specific case studies, providing tangible examples of their involvement and impact.

4. Empirical evidence of development banks' innovation interventions

The empirical literature examining the overall effectiveness of investments made by development banks is still limited. These financial institutions are highly heterogeneous across the different geographical areas and exhibit significant differences in their organizational structures and intervention methods [3]. However, some attempts have been made to systematize the empirical research on the activities of multilateral and national development banks worldwide. The official reports from development banks and the existence of academic studies on the subject provide valuable insights into the size of intervention of development banks, the operational scope of development banks (i.e., the specific areas of intervention), their effectiveness in leveraging private investments (i.e., the ability to attract and mobilize private resources), and the outcomes resulting from their actions (i.e., the impact of their interventions).

An increasing array of official reports at both national and international levels shed light on the magnitude of investments made by development banks globally. For example, the collective lending of multilateral development banks, encompassing the World Bank, regional development banks, and other intergovernmental agencies, was reported to amount to $63 billion in 2017 [59]. In addition to this amount, significant resources are annually allocated by national development banks within their respective countries. The same reports also aid in the quantification of the development banks' support in specific areas of intervention. For example, the members of the International Development Finance Club report green finance commitments for more than $1.2 trillion in the 2015–2021 period [60].

Development banks employ various approaches beyond direct lending in the pursuit of their objectives. European promotional banks, for example, actively manage EU financial instruments and implement programs to address the low level of investment by EU firms [11, 61]. In recent years, these banks have assumed a crucial role in supporting small-scale businesses that face challenges in obtaining bank financing, benefiting from direct access to capital markets and ECB liquidity measures. Notably, European promotional banks have been instrumental in mobilizing liquidity for micro, small, and medium enterprises, particularly in response to the COVID-19 crisis.

Empirical evidence also reveals the ability of the European development banks to use the corporate control market to shift financial resources toward specific areas of intervention. As revealed in [7], through acquisitions—i.e., obtaining majority equity

stakes in target firms—European development banks redirect aggregate investments toward activities serving public interest, social utility, and sectors of general interest (ESGI), such as energy, infrastructure, telecommunications, and transportation. Similarly, by participating in minority stake investments in early-stage companies alongside venture capital or private equity firms, they channel investments toward R&D activities in biotechnology and natural sciences.

Official reports and academic research also testify the effectiveness of development banks in leveraging private investments. According to [59], multilateral development banks mobilized a significant amount of long-term private co-financing in 2017, totaling $52 billion. Degl'Innocenti et al. [37] analyzes the impact of globally operating development banks on the syndicated loan market to assess their ability to attract other investors. Empirical evidence confirms their positive influence on the structure of syndicated loans by mitigating perceived risks for private investors and mobilizing additional financial resources. This effect is particularly pronounced in green sector enterprises, highlighting the critical role of these banks in addressing the new challenges posed by the SDGs.

Development banks go beyond merely shifting public and private investments from one sector to another. Clò et al. [62] presents empirical evidence indicating that development banks, through their participation as equity investors, have a significant impact on innovation in target firms by positively affecting their patenting activity. This impact is amplified when development banks collaborate with other investors, highlighting the importance of public-private partnerships in promoting innovation. This is particularly true for innovation aligned with the SDGs. Given the substantial investments required to achieve these goals, which often exceed the capacity of the public sector alone [63], such partnerships and collaborations are crucial.

Despite attempts to consider development banks as a whole and their common characteristics, most studies on their impact have focused on individual institutions and their specific traits (see, for example, [22, 64, 65] for the European Investment Bank; [66] for the Brazilian BNDES). Overall, these analyses provide mixed evidence on strengths and weaknesses of development banks all around the world, but they are useful in that they provide interesting case studies, useful benchmarks, and insights for future debates concerning the potential areas of intervention. Notably, the European Investment Bank (EIB) has been extensively researched, making it an interesting reference model for future research. The EIB supports innovation for economic growth, ranging from large-scale research to specialized spin-outs and digital networks in various sectors. Additionally, the EIB actively contributes to environmental projects to mitigate climate change and facilitate the transition to a low-carbon, environmentally friendly, and climate-resilient economy. It also provides support for transportation and sustainable urban infrastructure projects. In 2014, the EIB, in collaboration with the European Commission, launched InnovFin – EU Finance for Innovators, aimed at financing research and innovation by companies of all sizes, including startups and established firms, as well as research promoters. Since 1994, the EIB also established the European Investment Fund to support innovative high-tech SMEs in their early and growth phases, as well as technology transfer and business incubators. By promoting access to finance for SMEs and supporting innovation, the EIF contributes to fostering economic development within the European Union and to aligning its activities with the achievement of the SDGs. This function is enhanced by the concurrent support of promotional banks operating at the national level. Kreditanstalt für Wiederaufbau (KfW), for example, have been proven to have played a positive role in promoting green energy in Germany [67].

Despite the evident support provided by development banks to innovation, several instances exist of development banks misallocating resources to the benefit of politically connected firms and failing to manage efficiently their capital [58]. This evidence highlights the crucial need for sound management and effective risk monitoring in order to enhance the role of these banks in financing sustainable development. Moreover, citizens and researchers occasionally question the logic of political patronage and the spoils system in the appointment of key administrative positions within some development banks, as such behavior can influence investment priorities.

Overall, measuring the effectiveness of development bank interventions in terms of cost–benefit analysis presents a challenge that is common to all the research concerning entities whose sole objective is not profit maximization. While measuring profit is relatively straightforward, measuring environmental and social impacts is complex and an ongoing subject of study. However, many development banks are already adopting reporting practices to assess and disclose the environmental, social, and governance impacts of their lending activities and their support to the SDGs. In this regard, the field of research on innovation impact of development banks offers interesting analysis avenues. Indeed, in this field, empirical studies have proposed a number of useful indicators that may help to quantify the innovation activity, such as the quantity and quality of patents registered by invested firms, their growth in R&D investments, and intangible assets (see, for example, [62, 68–71] for a specific use of patents in the realm of development banks). In this context, given the existence of precise metrics, obtaining direct evidence on the effects of development bank interventions becomes more feasible. However, this requires researchers to have access to comprehensive databases containing precise information about investment portfolios and loans of the financial institutions under analysis.

The corporate control market, particularly private equity and venture capital, also presents an intriguing realm for analyzing the impact of investment by development banks. It allows observation of how many target companies of development bank investments achieve *successful exits* within a specified number of years. A successful exit signifies that the target company has experienced sufficient growth to attract additional private investors or even go public through an Initial Public Offering (IPO) (see, for example, [7] for an application to development banks). Interestingly, this potential area of analysis, with available and quantifiable information, aligns with similar studies already conducted on the impact of the so-called *government venture capital* [72].

Lastly, additional efforts are required to establish pertinent metrics and conduct evidence-based studies to better evaluate the effectiveness of development banks in achieving the SDGs. Furthermore, it is crucial for empirical analysis on the effectiveness of development banks to incorporate the more recent advancements in the econometrics of Difference-in-Differences (DiD) analyses or Synthetic Control Methods (SCM) for comparative studies [73, 74]. These advanced econometric approaches may result particularly useful in the realm of development banks and their various intervention areas, since the heterogeneity of these institutions and the characteristics of their interventions pose challenges for more traditional econometric approaches.

5. Open questions: determinants of development banks' effectiveness in supporting SDG-aligned innovation

To address the increasing financial demands of the 2030 Development Agenda and maximize their developmental impact, development banks need to possess specific

characteristics and operate within a favorable framework that enhances benefits and reduces potential costs. Economists and policymakers stress the importance of implementing appropriate policies and best practices to ensure the welfare-oriented role of development banks while mitigating the negative effects commonly associated with state-owned banks and enterprises, as documented in existing literature.

This issue raises several open questions that we believe theoretical and empirical research can contribute to, supporting policymakers in harnessing the maximum social benefits from the operations of these institutions. The key open questions can be summarized as follows:

- What should development banks finance?
- What are the most effective intervention tools?
- What characteristics should development banks possess to optimize their impact?
- What is the institutional context that maximizes the effectiveness of development banks?

Let us start with the first question: what should development banks finance? Firstly, development banks should refrain from investing in innovative projects that based on their characteristics (such as track record, guarantees, and time perspectives) may already attract private investors' resources without any need of additional public support. This mitigates the risk of crowding-out effects and enhances the benefits of blended finance. Intervention areas should focus on industries, activities, and types of enterprises where development banks have demonstrated expertise above the market average. This strategic approach is likely to serve as a positive signal for the market, a catalyst for private investors and mobilize financial resources toward desired areas. Enhancing the economic viability and profitability of innovation projects is crucial to attract additional funding for blended programs and public-private partnership arrangements, which are recognized as effective methods for achieving long-term public goals. At the same time, intervention areas must align with the received mandate of development banks to minimize the risk of inappropriate and politically motivated use of financial resources.

However, it would be erroneous to assume that the areas of intervention are clear and well-defined. This assumption hinges on the belief that either the bank's management or the government has a complete comprehension of the prevailing market failures and has the optimal approach to rectify them. As stated by Fernández-Arias et al. [58], "*the successful implementation of the development bank paradigm requires deep knowledge of market failures especially because economic development requires structural transformation and, in turn, structural transformation requires the creation of new activities which may be impeded by non-observable market failures*". It can be extremely difficult for policymakers to collect this information and consistently decide on the activities to promote. Addressing this issue still requires additional research efforts.

The second question pertains to the most effective intervention tools. Development banks enable economic progress by employing various intervention mechanisms, including direct or indirect loans, credit guarantees, and equity instruments such as venture capital, private equity, seed capital financing, and mezzanine financing [2, 58]. Existing empirical literature suggests that, through

active participation as acquirers or investors in the corporate control market, development banks can effectively contribute to economic objectives such as innovation and societal challenges. Vandone et al. [7] emphasizes the significant role of equity investments in supporting innovation financing. Indeed, in their role of shareholders, development banks can enhance the management of target firms by leveraging their expertise and competencies. Additionally, they can acquire valuable insights into the market constraints influencing investment levels while facilitating the participation of other potential investors [58]. As stated by Cefis and Marsili [75], M&As offer small firms an opportunity to surpass the innovation threshold, increasing the likelihood of transitioning from non-innovators to innovators and initiating the sale of innovative products.

Furthermore, development banks have assumed an increasingly vital role in syndicated lending, a prominent external funding channel typically utilized by global corporations. Participation in syndicate loans effectively mobilizes financial resources and supports risky projects [36, 40, 76]. Development banks' involvement in syndicated loans can also mitigate political risk [77] and have a "certificate effect" that positively impacts the structure of syndication by increasing the number of participating lenders and fostering broader loan ownership [37].

Given the diverse intervention possibilities and available instruments, further theoretical and empirical literature is certainly deserved to identify and delineate the most suitable and effective tools based on the objectives specified by development banks.

The third point pertains to the essential characteristics that development banks should possess to optimize their social and environmental impact while contributing to innovation. Financial sustainability stands out as a crucial aspect. While development banks have broader objectives beyond profitability, they must balance socio-economic goals with efficiency and profitability requirements to ensure their financial strength and stability [9, 78]. As argued in [14, 79], considering socio-economic goals and financial stability together is crucial for achieving a balanced and effective approach. Policymakers increasingly emphasize the need for development banks to achieve their objectives while maintaining financial stability and optimizing their balance sheets [4, 59]. For example, the Addis Agenda calls on multilateral development banks to make "optimal use of their resources and balance sheets, consistent with maintaining their financial integrity" [41]. Many national promotional banks today explicitly prioritize financial sustainability in their statutes. [80] also emphasizes the importance of managing risks and preserving credit ratings. To this aim, it is desirable for the size of public banks to be proportionate to their mandate. Smaller development banks face potential limitations, as highlighted in [9]. Their lower financial leverage ratio results in reduced capital generation, even with similar profitability levels. Moreover, smaller banks often rely more on short-term funding and exhibit lower-cost efficiency due to their size. They are also more susceptible to credit risk, a challenge commonly associated with commercial banks.

However, financial efficiency is not sufficient by itself. To achieve their objective minimizing political failures, development banks must adhere to sound banking principles and implement optimal banking standards and practices. Moreover, to avoid political lending, the corporate governance of development banks should ensure the existence of internal bodies whose appointment does not align with the political cycle [58]. This would help mitigate the risk of political interference in their decision-making processes. More in general, to effectively contribute to the attainment of the SDGs, development banks must align their activities with the recommended governance characteristics outlined in the Sustainable Development Report [1]. These

characteristics not only encompass effectiveness, but also transparency, accessibility, and inclusiveness. Embracing these principles becomes imperative for development banks as they strive to fulfill their role in sustainable development. Transparency fosters accountability and trust. Accessibility and inclusiveness further promote equal opportunities and social equity.

The final aspect worth considering is the institutional context. The institutional context in which development banks operate significantly influences their effectiveness in achieving objectives. In countries with weaker democratic governance, transparency, and institutional checks and balances, studies suggest a higher likelihood of opportunistic pre-electoral manipulation [81, 82]. Insufficient autonomy of development banks can lead to executive influence for incumbent re-election prospects. Consequently, in flawed democracies, development banks may deviate from their intended mandates and align with short-term political objectives. [55] finds no empirical evidence supporting opportunistic manipulation in fully democratic countries. However, politically driven lending practices are observed in countries with less robust political institutions, particularly during election years compared to the rest of the banking system. Consistently, Clò et al. [62] highlights that higher institutional quality positively impacts the patenting activity of firms targeted by European development banks for their equity investment. This effect can be explained by the influence of institutional quality on appointment procedures, internal governance, and monitoring mechanisms. Development banks in countries with high institutional quality are more likely to prioritize internal stability, transparency, and long-term socially valuable goals. In contrast, low-quality institutions are more prone to political capture, personal objectives, and misallocation of resources. Therefore, institutional quality significantly affects the orientation toward innovation and management capability of development banks.

6. Concluding remarks

In conclusion, this chapter presents a comprehensive examination of the pivotal role played by development banks in supporting innovation and the achievement of the SDGs. By tracing their historical trajectory, analyzing the economic fundamentals, and discussing existing empirical evidence, this chapter contributes to the ongoing discourse on the role of development banks in driving sustainable development through innovation. Moreover, it raises several key questions that can guide theoretical and empirical research. Particular attention has been given to the areas of intervention for development bank financing, the most effective intervention tools, the essential characteristics that development banks should possess, and the optimal institutional context that maximizes their effectiveness. By addressing these complex and multifaceted issues, future research can further advance our knowledge in this field and provide guidance for policymakers and stakeholders seeking to harness the full potential of development banks driving innovation within the framework of the SDGs. All of these aspects are relevant for the effective functioning of development banks but deserve further exploration within specific research streams.

In this context, it is crucial to consider analogous research activities pertaining to other financial entities directly controlled by or operating under explicit mandates from the public sector. Sovereign Wealth Funds (SWFs) offer a notable example, as they are state-owned investment funds that allocate resources across various financial assets, including stocks, bonds, and real estate, on behalf of the government.

These funds often originate from surplus revenues generated by natural resources or trade. Another intriguing area of inquiry lies in government venture capital, where governments or government-owned entities invest in early-stage or high-growth potential companies to stimulate innovation and support the development of strategic industries.

Conducting comparative analyses of these diverse forms of government engagement in financial endeavors would yield dual benefits. Firstly, fostering cross-pollination among various research streams on public actor involvement in financial activities would facilitate mutually beneficial exchange of valuable insights. Secondly, it would allow for a comprehensive analysis of the strengths and weaknesses inherent in these diverse approaches, providing a systematic perspective to the ongoing debate and enhancing our understanding of effective strategies for fostering innovation.

Conflict of interest

The authors declare no conflict of interest.

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References

[1] Independent Group of Scientists Appointed by the Secretary-General (United Nations). Global Sustainable Development Report 2019: The Future Is Now – Science for Achieving Sustainable Development. New York, United Nations; 2019

[2] Luna-Martinez J, Vicente CL, Arshad AB, et al. Survey of National Development Banks. Washington DC: World Bank; 2017

[3] Xu J, Ren X, Wu X. Mapping Development Finance Institutions Worldwide. Beijing: Institute of New Structural Economics at Peking University; 2019

[4] European Commission. Working Together for Jobs and Growth: The Role of National Promotional Banks (NPBs) in Supporting the Investment Plan for Europe. Brussels: Communication from the Commission to the European Parliament and the Council, COM(2015) 361 final; 2015

[5] Griffith-Jones S, Ocampo JA, editors. The Future of National Development Banks. Oxford: Oxford University Press; 2018. Epub ahead of print 22 November 2018. DOI: 10.1093/oso/9780198827948.001.0001

[6] Studart R, Gallagher KP. Infrastructure for Sustainable Development: The Role of National Development Banks. Boston: Boston University Global Economic Governance Initiative; 2016

[7] Vandone D, Frigerio M, Clò S. Contemporary development financial institutions in Europe. In: Bernier L, Florio M, Bance P, editors. The Routledge Handbook of State-Owned Enterprises. New York: Routledge; 2020. pp. 390-412

[8] McDonald DA, Marois T, Barrowclough D. Public Banks and Covid-19: Combatting the Pandemic with Public Finance. Kingston/Brussels/Geneva: Municipal Services Project/Eurodad/UNCTAD; 2020

[9] Frigerio M, Vandone D. A firm-level analysis of development banks in Europe. Vierteljahrshefte zur Wirtschaftsforschung. 2020;**89**:61-77

[10] World Bank. Global Financial Development Report 2013: Rethinking the Role of the State in Finance. Washington: World Bank Publications; 2012

[11] European Commission. An Investment Plan for Europe. Brussels: Communication from the Commission to the European Parliament, the Council, the European Central Bank, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank. COM(2014)903 final; 2014

[12] Wruuck P. Promoting Investment and Growth: The Role of Development Banks in Europe. Frankfurt am Main: Deutsche Bank Research; 2015

[13] Cingolani M. Necessary public investment: The role of public banks. International Journal of Political Economy. 2019;**48**:275-300

[14] Gutierrez E, Rudolph HP, Homa T, et al. Development Banks: Role and Mechanisms to Increase their Efficiency. Washington: World Bank Publications; 2011. Epub ahead of print 7 January 2011. DOI: 10.1596/1813-9450-5729

[15] CPI. Global Landscape of Climate Finance 2015. London: Climate Policy Initiative (CPI); 2015. Available from: https://climatepolicyinitiative.org/

wp-content/uploads/2015/11/Global-Landscape-of-Climate-Finance-2015.pdf; 2015 [Accessed: 26 May 2023]

[16] de Olloqui F, Chrisney MD, Lorenzo JJG, et al. Public Development Banks: Towards a New Paradigm? Washington D.C.: Inter-American Development Bank; 2013

[17] Musacchio A, Lazzarini S, Makhoul P, et al. The Role and Impact of Development Banks: A Review of their Founding, Focus, and Influence. Waltham, MA: Brandeis University; 2017.

[18] Bleda M, del Río P. The market failure and the systemic failure rationales in technological innovation systems. Research Policy. 2013;**42**:1039-1052

[19] Foray D, Mowery DC, Nelson RR. Public R&D and social challenges: What lessons from mission R&D programs? Research Policy. 2012;**41**:1697-1702

[20] Levi-Yeyati EL, Micco A, Panizza U, et al. A reappraisal of state-owned banks [with comments]. Economia. 2007;**7**:209-259

[21] Mertens D, Thiemann M. Building a hidden investment state? The European Investment Bank, national development banks and European economic governance. Journal of European Public Policy. 2019;**26**:23-43

[22] Clifton J, Díaz-Fuentes D, Gómez AL. The European Investment Bank: Development, integration, investment? JCMS. Journal of Common Market Studies. 2018;**56**:733-750

[23] Bator FM. The anatomy of market failure. Quarterly Journal of Economics. 1958;**72**:351

[24] Akerlof GA. The market for 'lemons': Quality uncertainty and the market mechanism. Quarterly Journal of Economics. 1970;**84**:488

[25] Coase RH. The problem of social cost. Journal of Law and Economics. 1960;**3**:1-44

[26] Greenwald BC, Stiglitz JE. Externalities in economies with imperfect information and incomplete markets. Quarterly Journal of Economics. 1986;**101**:229

[27] Hicks JR. Annual survey of economic theory: The theory of monopoly. Econometrica. 1935;**3**:1

[28] Leibenstein H. Allocative efficiency vs. 'X-efficiency'. The American Economic Review. 1966;**56**:392-415

[29] Stiglitz JE. Markets, market failures, and development. The American Economic Review. 1989;**79**:197-203

[30] Kay J. The kay Review of UK Equity Markets and Long-Term Decision Making: Interim Report. London: The Stationery Office Limited; 2012

[31] Levy-Yeyati EL, Micco A, Panizza U. Should the Government be in the Banking Business? The Role of State-Owned and Development Banks. Washington, DC: IDB Working Paper; 2004. p. 517

[32] Buiter WH, Fries SM. What Should the Multilateral Development Banks Do? London: EBRD; 2002

[33] Eslava M, Freixas X. Public development banks and credit market imperfections. Journal of Money, Credit and Banking. 2021;**53**:1121-1149

[34] De la Torre A, Ize A. Regulatory Reform: Integrating Paradigms.

Washington: World Bank Publications; 2009. Epub ahead of print 17 March 2009. DOI: 10.1596/1813-9450-4842

[35] Schclarek A, Xu J, Yan J. The maturity-lengthening role of national development banks. International Review of Finance. 2023;**23**:130-157

[36] Broccolini C, Lotti G, Maffioli A, et al. Mobilization effects of multilateral development banks. World Bank Economic Review. 2021;**35**:521-543

[37] Degl'Innocenti M, Frigerio M, Zhou S. Development banks and the syndicate structure: Evidence from a world sample. Journal of Empirical Finance. 2022;**66**:99-120

[38] OECD. Breaking Silos: Actions to Develop Infrastructure as an Asset Class and Address the Information Gap. Paris: OECD Publishing; 2017

[39] OECD. Capital Market Instruments to Mobilize Institutional Investors to Infrastructure and SME Financing in Emerging Market Economies. Paris: OECD Publishing; 2018

[40] OECD. MAking Blended Finance Work for the Sustainable Development Goals. Paris: OECD Publishing; 2018. Epub ahead of print 29 January 2018. DOI: 10.1787/9789264288768-en.

[41] United Nations. Addis Ababa Action Agenda of the Third International Conference on Financing for Development (Addis Ababa Action Agenda). New York, United Nations; 2015

[42] DFI Working Group on Blended Concessional Finance for Private Sector Projects. Joint Report December 2021 Update. Washington: IDB; 2021

[43] Mazzucato M, Penna CCR. Beyond market failures: The market creating and shaping roles of state investment banks. Journal of Economic Policy Reform. 2016;**19**:305-326

[44] Kornai J. Resource-constrained versus demand-constrained systems. Econometrica. 1979;**47**:801

[45] Shleifer A, Vishny RW. Politicians and firms. Quarterly Journal of Economics. 1994;**109**:995-1025

[46] Shleifer A, Vishny RW. A survey of corporate governance. The Journal of Finance. 1997;**52**:737-783

[47] Hart O, Shleifer A, Vishny RW. The proper scope of government: Theory and an application to prisons. Quarterly Journal of Economics. 1997;**112**:1127-1161

[48] La Porta R, Lopez de-Silanes F, Shleifer A. Government ownership of banks. The Journal of Finance. 2002;**57**:265-301

[49] Odedokun MO. International evidence on the effects of directed credit programmes on efficiency of resource allocation in developing countries: The case of development bank lendings. Journal of Development Economics. 1996;**48**:449-460

[50] Lin JY, Tan G. Policy burdens, accountability, and the soft budget constraint. American Economic Review. 1999;**89**:426-431

[51] Ades A, Di TR. National champions and corruption: Some unpleasant interventionist arithmetic. The Economic Journal. 1997;**107**:1023-1042

[52] Sapienza P. The effects of government ownership on bank lending. Journal of Financial Economics. 2004;**72**:357-384

[53] Claessens S, Feijen E, Laeven L. Political connections and preferential

access to finance: The role of campaign contributions. Journal of Financial Economics. 2008;**88**:554-580

[54] Khwaja AI, Mian A. Do lenders favor politically connected firms? Rent provision in an emerging financial market. Quarterly Journal of Economics. 2005;**120**:1371-1411

[55] Frigerio M, Vandone D. European development banks and the political cycle. European Journal of Political Economy. 2020;**62**:101852

[56] Nordhaus WD. The political business cycle. The Review of Economic Studies. 1975;**42**:169

[57] European Commission. Financing a sustainable European economy. In: Final Report by the High-Level Expert Group on Sustainable Finance. Brussels: European Commission; 2018

[58] Fernández-Arias E, Hausmann R, Panizza U. Smart Development Banks. Journal of Industry, Competition and Trade. 2020;**20**:395-420

[59] United Nations – Inter-agency Task Force on Financing for Development. Financing for Sustainable Development Report 2019. New York, United Nations; 2019

[60] IDFC. Green Finance Mapping Report 2022. London: Climate Policy Initiative (CPI); 2022

[61] European Parliament. New Financial Instruments and the Role of National Promotional Banks. Brussels: DG IPOL Study; 2015

[62] Clò S, Frigerio M, Vandone D. Financial support to innovation: The role of European development financial institutions. Research Policy. 2022;**51**:104566

[63] OECD. Infrastructure Financing Instruments and Incentives. Paris: OECD Publishing; 2015

[64] Griffith-Jones S, Tyson J. The European Investment Bank and its Role in Regional Development and Integration. In: Macedo Cintra MA, Rocha Gomes K, editors. The Transformations of the International Financial System. Brasilia: IPEA; 2015

[65] Tuijnman A. The education lending policy of the European Investment Bank. European Journal of Education. 2009;**44**:111-125

[66] Lazzarini SG, Musacchio A, Bandeira-de-Mello R, et al. What do state-owned development banks do? Evidence from BNDES, 2002-09. World Development. 2015;**66**:237-253

[67] Griffith-Jones S. National Development Banks and Sustainable Infrastructure; the Case of KfW. Boston: Boston University Global Economic Governance Initiative; 2016

[68] Dodgson M, Hinze S. Indicators used to measure the innovation process: Defects and possible remedies. Research Evaluation. 2000;**9**:101-114

[69] Archibugi D, Planta M. Measuring technological change through patents and innovation surveys. Technovation. 1996;**16**:451-519

[70] Griliches Z. Patent statistics as economic indicators: A survey. Journal of Economic Literature. 1990;**28**:1661-1707

[71] Kleinknecht A, Van Montfort K, Brouwer E. The non-trivial choice between innovation indicators. Economics of Innovation and New Technology. 2002;**11**:109-121

[72] Brander JA, Du Q, Hellmann T. The effects of government-sponsored venture capital: International evidence*. Review of Finance. 2015;**19**:571-618

[73] Roth J, PHC S'A, Bilinski A, et al. What's trending in difference-in-differences? A synthesis of the recent econometrics literature. Journal of Econometrics. 2023;**235**:2218-2244

[74] Abadie A, Diamond A, Hainmueller J. Synthetic control methods for comparative case studies: Estimating the effect of California's tobacco control program. Journal of the American Statistical Association. 2010;**105**:493-505

[75] Cefis E, Marsili O. Crossing the innovation threshold through mergers and acquisitions. Research Policy. 2015;**44**:698-710

[76] Gurara D, Presbitero A, Sarmiento M. Borrowing costs and the role of multilateral development banks: Evidence from cross-border syndicated bank lending. Journal of International Money and Finance. 2020;**100**:102090

[77] Hainz C, Kleimeier S. Political risk, project finance, and the participation of development banks in syndicated lending. Journal of Financial Intermediation. 2012;**21**:287-314

[78] Frigerio M, Vandone D. Bank ownership and firm-level performance: An empirical assessment of state-owned development banks. In: García-Olalla M, Clifton J, editors. Contemporary Issues in Banking: Regulation, Governance and Performance. Cham: Springer International Publishing; 2018. pp. 197-219

[79] Diamond W. Development Banking. Baltimore, MD: The Johns Hopkins University Press; 1957

[80] Multilateral Development Banks. MDB Action Plan to Optimize Balance Sheets. Toronto: University of Toronto; 2017

[81] Schuknecht L. Political business cycles and fiscal policies in developing countries. Kyklos. 1996;**49**:155-170

[82] Shi M, Svensson J. Political budget cycles: Do they differ across countries and why? Journal of Public Economics. 2006;**90**:1367-1389