

Measuring the Influence of IDB Knowledge to Promote Development Effectiveness

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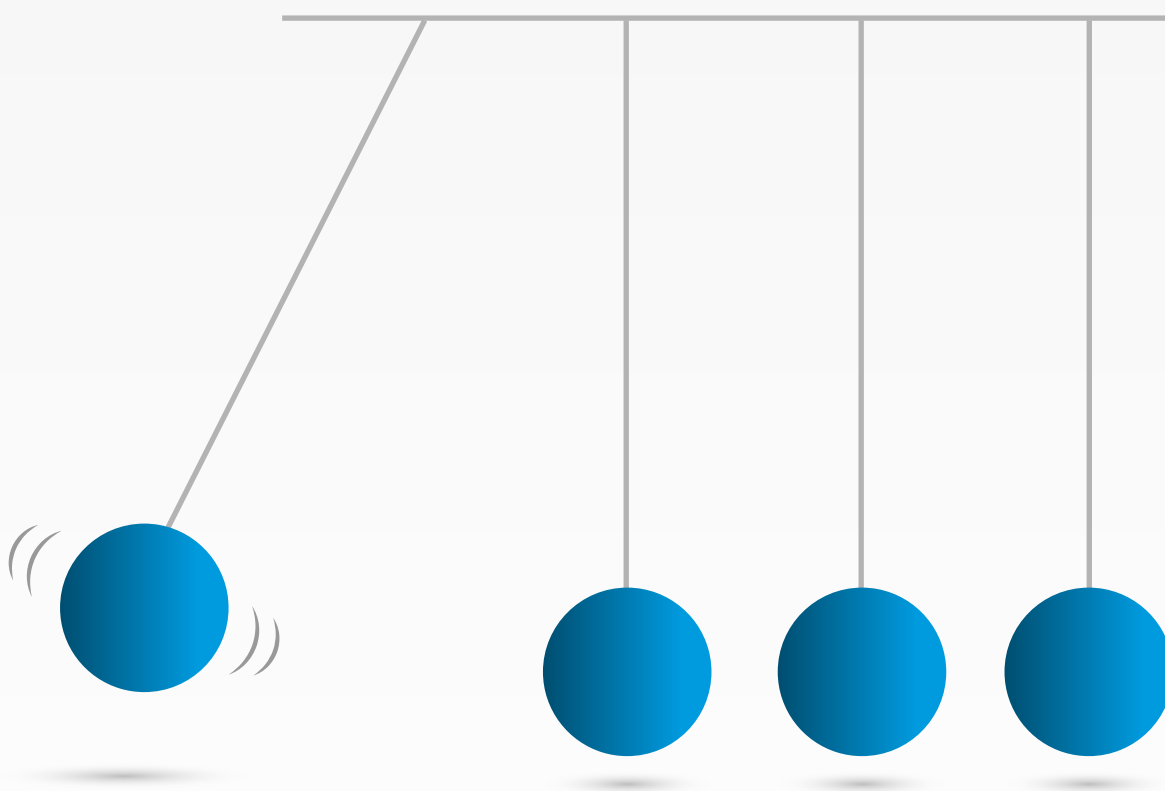
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Abstract

This technical note discusses a framework and methodology for building an index to measure the impact of knowledge produced and disseminated by the Inter-American Development Bank, known as the knowledge influence score. This index seeks to measure what happens after the product reaches the target audience and how it contributes to larger IDB business goals through three dimensions: reputation, policy landscape, and operations. The note contains proposals for possible metrics that could make up the index, as well as a proof of concept and an outline for possible actions to build a more robust measurement.

JEL Codes: D83

Keywords: knowledge management, knowledge measurement, development effectiveness, impact measurement, reputation, communications

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Executive Summary

The Inter-American Development Bank (IDB), as part of its mission to promote economic and social development in Latin America and the Caribbean, devotes significant resources to producing and disseminating knowledge, defined as technical expertise in public policy packaged into formats such as publications, courses, and datasets. Knowledge is among the Bank's core functions defined in its charter and internal strategy documents. There is a strong consensus among staff that knowledge pervades the economic and social development decision-making process, helping to advance the IDB's mission and ensure that projects generate the expected development results. However, metrics to measure the specific impacts are currently inadequate, especially given the complex interplay of stakeholders and external factors in public policy.

This technical note proposes a way to close this measurement gap and better understand the Bank's knowledge contribution to defined business outcomes by developing a methodology known as the knowledge influence score. It outlines the conceptual framework used to generate the score and defines relevant metrics, based on a review of the literature published on this topic, an analysis of best practices across peer institutions, and extensive interviews with Bank staff. The methodology produces an index of the influence, establishing that IDB knowledge products influence the integration of evidence into development effectiveness. The score measures influence along three dimensions that are essential to the IDB' core mission: (i) to be positioned as a subject matter expert (reputation), (ii) to build consensus on development approaches and determine how to best implement them (policy landscape), and (iii) to generate and drive development solutions or projects based on evidence (operations). Corresponding metrics to populate the index are designed to evaluate how knowledge is both perceived (perception) and used (citation) to contribute to the defined outcomes.

A proof-of-concept calculation using available data is conducted for both informality and public spending to evaluate the knowledge influence score and discuss implications. The note concludes by discussing limitations in the current process and providing options for building a more robust index. The proof-of-concept exercise shows that the score could be a useful tool to help inform IDB knowledge strategy.

1. The Importance of Knowledge Impact Measurement

At the inception of the Inter-American Bank (IDB), its Board of Governors gave two distinct mandates: (i) to provide technical assistance to support knowledge and capacity building in the Latin American and Caribbean (LAC) region and (ii) to fund social projects (OVE, 2019). As a result, knowledge is a critical component in two of the five functions defined in the agreement to establish the IDB, namely to (i) cooperate with member countries for orienting development policies and (ii) provide technical assistance for the design and implementation of development interventions (IDB, 1996). In general terms, the IDB uses knowledge through ongoing dialogue with LAC governments to inform, build consensus, and increase capacity on best approaches to promote development based on evidence. However, given that in democratic societies policymaking extends beyond the realm of the public sector, knowledge is also useful to inform the private sector, civil society, academia, and specific stakeholders that are engaged in or have influence over the policymaking process. To increase accessibility and reach, the IDB shares knowledge in the form of digital publications (e.g., books, monographs, working papers, technical notes, learning material, and brochures) and online public courses. As of January 2022, the IDB had published 13,200 documents, generating approximately 36 million downloads (64 percent of which took place in the LAC region), and 344 massive online courses (MOOCs), with about 1.9 million total registrations (83 percent of which took place in the region¹).

Empirical research confirms the importance of knowledge to Bank operations. Avellán et al, (2021) indicate that downloads of IDB publications in borrowing member countries are more frequent, in particular when the content is relevant to local context. Another qualitative study based on structured interviews with staff members in IDB headquarters and country offices revealed a consensus that knowledge is key to competitive advantage in two main domains: (i) knowledge as part of the operations lifecycle and (ii) knowledge for research purposes (IPSOS, 2021). Respondents claimed that knowledge is embedded in the entire cycle of IDB operations. Employees working on operations were more concerned with client and country-focused knowledge that can have an immediate impact by supporting program development and implementation. Others working on knowledge production and dissemination were focused on providing insights that can set the development agenda in the medium-term, helping build the IDB's reputation as a subject matter expert.

¹ See <https://tableaubi.iadb.org/views/KPI/Home?embed=y&render=n&toolbar=n#2>.

1.1 A Critical Area for Advancement

Knowledge impact measurement can provide insight into prioritization, strategy, and use of resources. These insights can enable the Bank to improve development effectiveness, and knowledge agendas and go beyond the diagnostics to include applicable recommendations. In turn, it can help increase returns on knowledge production and dissemination and advance the IDB's mission of promoting development.

Multiple reviews of the Bank's knowledge work have identified the need for a robust method to measure its influence. IDB (2019: xii) conclude that "the Bank needs to keep strengthening the arrangements for originating, tracking, delivering, disseminating, and measuring the use of its knowledge activities." In addition, interviews with IDB employees highlight how relevant this goal is to internal operations. Several interviewees pointed out the need for improvements in planning, prioritization, and use of resources to produce, disseminate, and measure the impact of knowledge.

Moreover, in their interviews, stakeholders highlighted the difficulties that the IDB has in making the necessary measurements. Other multilateral development organizations are in similar situations. In addition to the inherent challenges of defining and tracking knowledge investments in terms of resource input, a principal hurdle arises from the fact that IDB employees create knowledge for different objectives. Some are more focused on introducing and disseminating new ideas and research to advance knowledge frontiers, whereas others favor information that can enhance the effectiveness of existing processes and programs. These two groups of employees use knowledge that is targeted to different audiences at different moments in their project cycle and in different formats depending on the defined objective. These divergences make it difficult to track all of the impacts and develop a uniform tool for measurement.

2. The Current State of Knowledge Measurement

Knowledge measurement involves three main approaches: determining how existing knowledge is utilized, measuring output of new knowledge, and assessing impact. Moczydlowska (2007: 357) defines knowledge measurement as "procedures which are supposed to deliver information on the size of the knowledge resources, the kind of knowledge, the usage of it in the realization of the organization aims."

Due to the many dimensions of knowledge management, from the generation of new knowledge to its application to programs and partnerships, it is important to distinguish between different types of measurement in general as well as the impact in particular. Knowledge measurement evaluates important outcomes of the management processes, such as whether or not the products are reaching the targeted audiences.

Measuring knowledge impact identifies the resulting attitudinal or behavioral change, whether through stakeholder perceptions or shifts in public policy. This type of measurement is difficult, particularly in contexts where financial value is not easily assigned. Ragab and Arisha (2013) assert that the primary motivation for knowledge measurement is to value an organization's intellectual capital. However, such valuations assume that the intellectual capital can be readily quantified and valued, whether through the sale of knowledge products (e.g., books), quantification of knowledge assets (e.g., patents), or the calculation of expenses required to create the products and assets (e.g., employee salaries, R&D costs, and outsourcing fees). Alternatives to financial methods of knowledge measurement include human capital methods, intellectual capital methods, and performance methods (see Appendix I for a more detailed examination of these approaches).

2.1 Knowledge Measurement in other Multilateral Development Banks

The hybrid public and private context in which multilateral development banks (MDBs) operate makes it difficult to measure knowledge impacts. MDBs and other development organizations operate in diverse multinational settings and exchange knowledge among a wide range of stakeholders as part of a broad variety of programs. Knowledge impact measurement requires tracing the lifecycle of knowledge (i.e., production to dissemination to consumption to impact) to assess relevant outcomes, but the complexity of the operations in these types of organizations makes this goal difficult to achieve (Annandale et al., 2001; Menou, 1993). In general, MDBs fully understand the importance of knowledge management and their role as brokers in the process (ADB, 2012; World Bank, 2021), but they struggle to measure knowledge, let alone its impact, due to a lack of consistent concepts, definitions, objectives among stakeholders (e.g., quantity, relevance, quality, impact), measurement tools and metrics, and practices among staff. A few organizations have completed studies, predominately through surveys, such as the AidData Listening to Leaders longitudinal research series (Custer et al., 2018; 2021), which analyzes the impact of technical assistance on development cooperation and aims to understand the relationship between policy advice and the setting of policy priorities. In general, the literature in this area is sporadic and largely siloed within individual institutions (see Appendix II for a thorough review of efforts to measure knowledge impact across a set of key MDBs).

2.2 Knowledge Measurement in other Industries

Given the gaps in knowledge impact measurement research in the multilateral context discussed herein, it is helpful to study assessment practices used in other industries. As previously mentioned, most knowledge measurement research largely focuses on the performance of specific knowledge-related processes and does not adequately consider the measurement of impact.

Impact measurement is common in the evaluation of academic research. Groups such as CityScore, SCImago Journal Rank (SJR), and Source Normalized Impact per Paper (SNIP) evaluate research journals using well-known methods to assess their impact (Elsevier, 2021). In an in-depth examination of the United Kingdom's national higher education research assessment system, Wilsdon et al. (2015) reveal some of the limitations of using quantitative evaluation metrics at scale, finding that they do not adequately capture research quality when research is first published and only begin to correlate as a publication ages. Most importantly, quantitative indicators incentivize researchers to focus only on formats that are rewarded. For researchers at MDBs, being incentivized to publish in journals where their citations are more visible could decrease the actual policy impact of their work, given that policymakers tend to rely more on grey literature or policy documents where research is heavily used but not cited in an easily tracked format.

Knowledge management, transfer, and exchange (KTE) describes the evaluation of interactions between researchers and research users, similar to those seen in technical assistance scenarios. KTE activities can benefit organizations by enhancing their spillover effects on target audiences and communities, which is what the IDB seeks to achieve. However, the majority of KTE literature is generated in healthcare and international business settings (e.g., Beretta, 2021; Hamdoun, Jabbour, and Othman, 2018; Horvath et al., 2017; Lee and Ma, 2019). In their examination of knowledge management effectiveness in public sector organizations, McEvoy, Ragab, and Arisha (2019) find that strong knowledge management agendas could help government organizations to provide services more effectively, thus linking such activities with public outcomes. However, there is still a gap in the understanding of how to build knowledge impact measurement tools that capture effects in an MDB context where financial and non-financial performance are intentionally intertwined.

2.3 Implications for Knowledge Measurement at the Inter-American Development Bank

Based on the literature review, current knowledge measurement practices focus more on the performance of the process than on the impact on desired outcome (e.g., influencing public policy). This is due to the methodological difficulties associated with the nature of knowledge and complexity of the creation processes. MDBs have made

some efforts to evaluate knowledge impact, but these have been mostly limited to specific research programs or knowledge-related processes, and currently there is no standard for measurement. Establishing a unified methodology in this sense could help to strengthen and broaden knowledge management practices across MDBs and similar multilateral organizations.

3. The IDB's Approach to Knowledge Measurement

To support the IDB's mission of promoting social and economic development, knowledge can serve two purposes. First, it ensures evidence-based loan operations, thereby increasing overall effectiveness. Second, it encourages countries to implement evidence-based policies and approaches, thus leveraging it beyond loan operations. Therefore, the IDB's impact is based on its ability to encourage the integration of evidence, in the form of knowledge, into policymaking and development work in the region—that is, its influence. Influence is an important indicator that can help measure knowledge impact.

The AidData Listening to Leaders program tracks policymakers' perceptions of the MDBs ability to encourage the adoption of evidence and decomposes it into perceived influence on the policy agenda, usefulness of technical advice, and helpfulness in implementation (Custer et al., 2018). Knack et al. (2020) also compare its return on investment from lending versus knowledge production by comparing their relative influence on policy priorities.

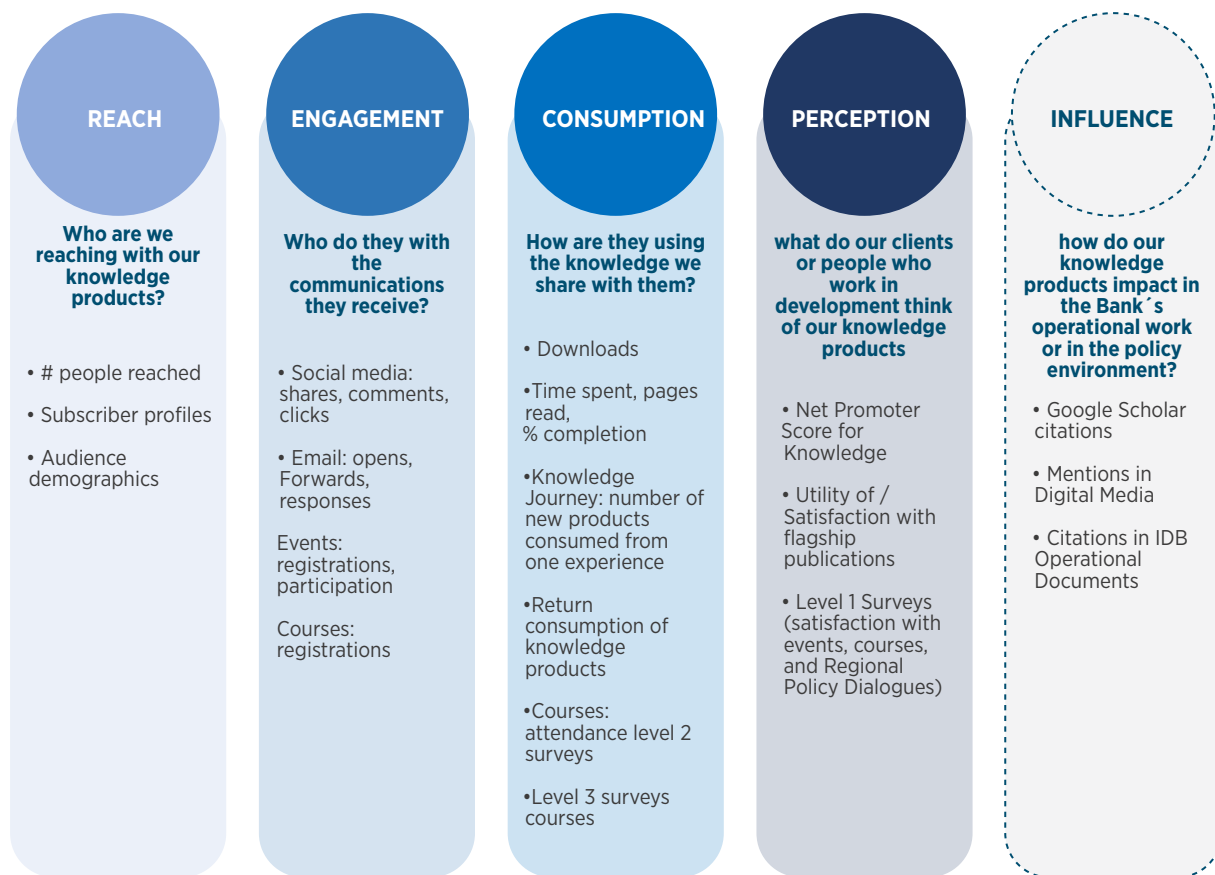
3.1. The IDB Knowledge Measurement Framework

The IDB's current knowledge measurement framework lays out the end-to-end process of assessing dissemination efforts (i.e., is it reaching the target audience, how many people are downloading and sharing the product, are consumers finding the information useful). This technical note intends to complement and complete the current framework by proposing a tool to understand what happens after the knowledge reaches the target audience and how it contributes to larger business goals (i.e., its influence). It is important to keep in mind that communication is key throughout the process and includes, among other responsibilities, making sure the products reach the targeted audiences through appropriate and relevant channels, using data to support arguments, and discussing topics that resonate with the target audience.

The current framework can be divided into four levels. The first measures reach, that is, how many people are aware of the knowledge products or courses through dissemination efforts and what types of demographics they belong to. The second level evaluates engagement, for example, do they share the product or register for the course.

The third measures consumption, for example, how many people download and On one hand, this technical note aims to enhance existing IDB knowledge measurement practices by including the conceptualization of influence metrics and their proxies. On the other, the goal is to build a comprehensive agenda for measuring and assessing the influence of knowledge.

Figure 1. Knowledge Measurement Framework with Five Levels



3.2. Conceptual Framework for Measuring the Bank's Knowledge Influence

This note defines an effective measure of knowledge as its capacity to influence decisions of key stakeholders in benefit of the IDB's mission to promote development in the LAC region. Given that technical assistance is critical to financing development projects and taking into consideration the Bank's role as a multilateral institution, there are three dimensions to consider in gauging and increasing its knowledge influence: reputation, policy, and operations.

On one hand, this technical note aims to enhance existing IDB knowledge measurement practices by including the conceptualization of influence metrics and their proxies. On the other, the goal is to build a comprehensive agenda for measuring and assessing the influence of knowledge.

Building Reputation: How much has IDB knowledge positively influenced its reputation as a provider of development solutions?

To promote development, the IDB needs to be perceived as a reputable institution capable of bringing effective solutions to countries (Björk, 2007). The Bank considers knowledge to be one of its main strategic assets and a distinguishing characteristic that puts it on the same playing field as other multilateral development organizations. The depth and breadth of its products gives the Bank credibility and authority to position itself as a credible and strategic development partner on issues in the LAC region.

The reputation influence dimension of the proposed methodology seeks to determine the relative contribution of knowledge to that positive outcome. To that end, the metrics that make up this dimension measure the attitudes and actions of IDB stakeholders who have consumed IDB knowledge. They are also designed to measure how those knowledge products may have impacted stakeholders' perception of the institution and/or led them to cite or recommend the IDB as a subject matter expert. In the digital space, this dimension tracks the conversations on IDB maintained or led social media platforms. The assumption is that the frequency of IDB mentions in relation to a particular topic is indicative of its reputation as a subject-matter expert. Given the continuing importance of traditional media in setting agendas and framing public policy debates, this dimension also seeks to measure the interest of key actors in this realm (e.g., journalists, editors, and columnists) to engage with the IDB. These media references signal that the IDB is indeed a reputable institution that should weigh in on key development conversations highlighted by the media.

Reputation dimension can be measured in two parts. The first one is the effective use of knowledge, which is represented by the number of citations and mentions of IDB knowledge products in digital media. Under such metrics, a larger number of citations on digital media platforms alludes to the influence of IDB products, thus indicating the IDB's importance as an authority in the subject matter. The second is the perception of IDB stakeholders. Reputation is an important indicator of the perceived value of one's expertise and its impact on others. This perception can be measured through certain variables and data sources such as the net promoter score (NPS), media requests, and satisfaction surveys. The NPS is a widely used metric that evaluates satisfaction and loyalty, which can be applied to knowledge-based services. Media requests are also In

key indicators to estimate reputation as they show the level of interest and trust placed in an individual's expertise by journalists and the media. Finally, satisfaction surveys can provide valuable feedback on the quality of knowledge and expertise provided, which can affect an individual's reputation in the industry.

Moreover, using these variables and data sources, the IDB can effectively measure and improve its reputation; if the IDB produces influential knowledge, its NPS score should be higher, indicating that respondents will be more likely to recommend it as a provider of knowledge solutions. Also, it is more likely to be contacted by the media for comments on a given topic, demonstrating the recognition of the IDB as a subject matter expert.

Improves policy environment: How much has IDB knowledge shifted the policy landscape towards its vision for solutions to achieve development in the region?

Part of the IDB's mandate involves the provision of technical assistance to its member countries. With the rise of the concept of the knowledge economy, the IDB and other multilateral organizations perceive their knowledge as a public good that benefits not only governments, but also other stakeholders involved in the policymaking process. In this context, the Bank's knowledge could influence government decisions toward what it considers as best practices or development priorities. Such knowledge, delivered through technical assistance, policy dialogues, or consumption of various knowledge products, should complement Bank financing as well as foster collaboration to solve shared problems.

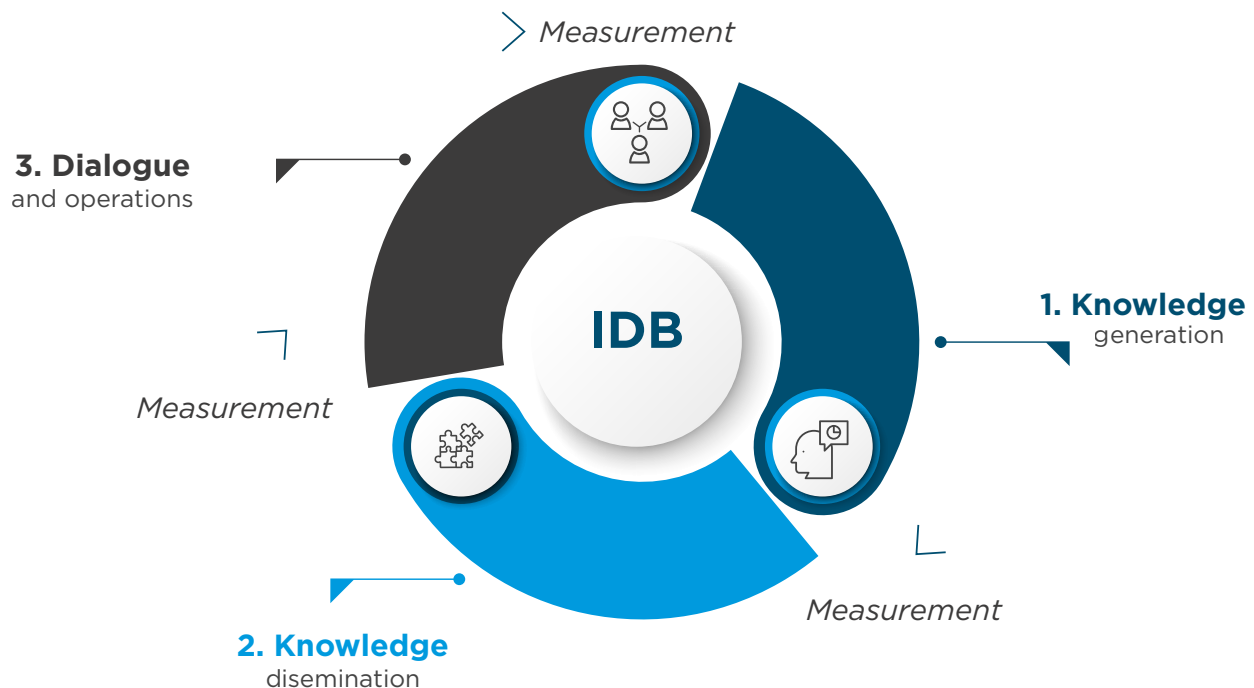
The IDB, as a policy catalyst, uses knowledge to influence public policy decisions that will contribute to its mission. To this end, the IDB produces recommendations adapted to the needs and contexts of its borrowing member countries. These take form of technical assistance, publications, events, courses, impact evaluations, among others (Hawkins, Wolferts, and Nielson, 2018). The goal of the policy impact dimension of the proposed methodology is to determine how IDB knowledge has helped shift the policy landscape toward solutions that advance development in the region. Metrics in this dimension seek to determine whether knowledge was used to justify or inform country public policy decisions (e.g., citations in government documents) and inform public policy research (e.g., citations in academic documents). Alternately, given the complex environments in which the IDB's policy ideas are applied, these metrics can measure whether its knowledge generated an intent among targeted audiences to apply such knowledge to their public policy work, regardless of whether they worked with the IDB on a project or technical cooperation. In other words, was the knowledge useful or relevant enough to be applied by specific stakeholders, considering that there are factors outside the control of the IDB that can affect the application of knowledge, such as institutional capacity or lack of political will.

In effect, this policy dimension seeks to measure the influence of IDB knowledge products by capturing their effective use in policy and academic documents and the intention to apply it to policies and interventions in their countries. The key assumption is that if the IDB produces influential knowledge, more policymakers will use it to design and implement public policies. This influence is reflected in more citations in official documents, such as policy briefings, legislation, strategies, and budgets. In addition, this influential knowledge is cited by academic works that contribute to the policymaking process. Another potential measurement for this specific dimension could also include surveys with policymakers to measure their intention to apply what they learned from IDB on the design of policies or specific interventions.

Benefits IDB Operations: How much has IDB knowledge contributed to informing or generating further operational business?

Knowledge is seen as a key ingredient in project generation, to make the case and build buy-in for development interventions, as well as in the preparation and implementation of projects, integrating lessons learned about what works and what does not. As a result, knowledge can contribute to the generation of new operations for the IDB and to improve the quality of the solutions adopted by IDB projects approved for borrowing member countries in a type of virtuous cycle, as visualized in Figure 2.

Figure 2. The Virtuous Cycle of Knowledge



Impactful knowledge work allows for the Bank to anticipate challenges and advance the structuring and implementation of new development interventions to address them. This work supports policy recommendations with evidence, increasing the development effectiveness of both lending operations and technical assistance.

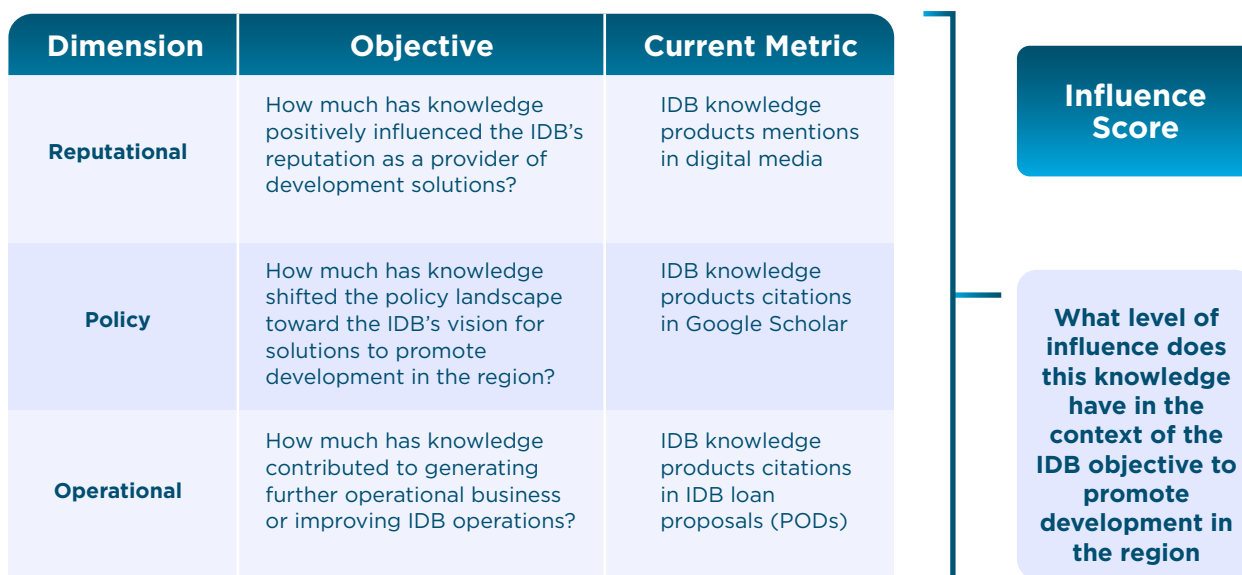
Different metrics can be used to measure the influence of IDB knowledge on operations. The first, and most tangible, metric refers to the number of citations of knowledge products in operational documents. The assumption relies on the delivery of relevant knowledge produced by the IDB. Under such assumption, this production should be robust enough to be used as reliable and rigorous source of evidence in the formulation of interventions financed by the IDB, and the diagnoses and evidence used by different operational documents such as loan proposals, technical cooperations, and project completion reports. Additional metrics that seek to measure new business opportunities and how knowledge plays a role in their generation and even how knowledge can contribute towards producing operations that achieve better results would be important to understand in evaluating the influence of knowledge.

These three dimensions and their metrics are the central part of this methodological framework for measuring the influence of IDB knowledge. This section covers existing metrics and others that the Bank should strive to build. The appendix presents a series of tables and a figure summarizing the current and upcoming metrics that are part of this knowledge influence agenda.

4. Construction of the IDB Knowledge Influence Score: Methodology

As part of the operationalization of this knowledge influence framework, a proof of concept was conducted using the available data and variables to demonstrate its practical application. The goal is to assess the feasibility of the proposed method and identify areas for further improvement. This proposal utilizes an index methodology process to generate a knowledge influence score. The assumed benefits of knowledge have been consolidated into a set of dimensions as discussed above (reputation, policy landscape, operations) and metrics have been identified that relate to each. Data are collected for these identified metrics on specific products, which in the case of this first iteration applies exclusively to publications, and the result is a composite score that represents the knowledge influence of topic. The purpose is to explore the feasibility of creating an index with available data and identify what data are still needed to develop a more comprehensive index. Figure 3 outlines the objective of each dimension of the framework, the current metrics used for calculating the aggregated, and each component of the knowledge influence score.

Figure 3. Knowledge Influence Score: Current Framework and Metrics



Notes: This figure does not intend to cover all possible influence the product can have, but focuses on dimensions that are considered most relevant, with a more direct link to promoting development and for which actual metrics can be produced through surveying the targeted audiences. Moreover, these are proposed metrics to capture aspects of the given dimension and are not all available for use as of the construction of this technical note.

4.1 Index Construction

Unit of analysis

This section walks through the methodology to design the index from unit of analysis to weighting and the calculation of each dimension. The knowledge influence score can be applied differently: (i) to a set of knowledge products on a specific topic/public policy issue, and (ii) based on the output of a specific IDB business unit or the entire institution. The selection of unit of analysis depends on the capacity of the Bank to produce related metrics as well as how it plans to use the results to improve its business operations. While applying an index to a single knowledge product can provide more detail and be more easily tracked over time, it is not practical considering the volume of IDB knowledge products produced each year. In addition, attributing influence to a single knowledge product requires making a strong assumption that is difficult to test. On the other hand, regarding the second option, collapsing the entire production of knowledge into a single institutional-level index would conceal the variability between, organizations, topics, and subject areas.

For these reasons, this note begins with an analysis of the first option, creating a topic-based index as a middle ground to achieve a sufficient level of granularity with easy-to-interpret and actionable results. A topic-based index has the advantage of addressing points of actionability that emerge during internal stakeholder interviews, as it is easier to analyze topics that have a larger share of attention in a given period and then identify additional demands for analysis. As such, it is possible to prioritize knowledge generation at the sector level and enable more efficient solutions to countries' needs.

Time frame

The citation-based indexes are based on the number of citations that a single knowledge product has received in the past n years, where n ranges from 2 (i.e., standard IF) to 5 (5-years IF or 5-years H-index, calculated by Google Scholar (Minasny et al., 2013)). While some scientific products continue to be cited for 10 years or more, for the purpose of the present study, the knowledge influence score is calculated for a given year on works produced in the five years that precede it, aligning with established practice while including the maximum amount of relevant information. This date range allows for examining the index in the short to medium term, while at the same time avoiding issues (e.g., completeness/reliability) that could arise from events that occurred in a more remote past.

Index weighting

There are two ways to approach the decision of how weighting can be applied to each metric: (i) a data-driven approach using dimensionality reduction techniques and (ii) a top-down approach, utilizing expert assessment of the relevance of each metric. This study assigns equal weights to each metric, noting that the use of both data-driven and bottom-up weights could be explored in future iterations of the knowledge influence score when other measures are added to strengthen the index. In this approach, the score is equivalent to the sum of the individual metrics (appropriately normalized). While this could be seen as less sophisticated than its alternatives, it is easily understandable and an advisable practice when the number of metrics is small.²

² An equal weights approach does not result in an index of inferior quality. For instance, this approach was also adopted when creating widely used indices such as the Human Development Index (HDI) (see <https://hdr.undp.org/system/files/documents/technical-notes-calculating-human-development-indices.pdf>, sourced on 25/10/2021).

4.2 Calculation of Metrics

Based on limited data available, the initial version of the knowledge influence score is based on only three metrics: (i) mentions in digital media, (ii) academic citations related to a given topic, and (iii) citations in IDB operational documents related to a given topic.³

Table 1. Metrics Utilized Based on Available Data

Dimension	Available Metric	Calculation
Reputation	Mentions in Digital Media	Number of IDB mentions that cite an IDB Knowledge Product about topic J in the year i
Policy	Academic Citations	Number of IDB citations about topic J in Google Scholar in the year i
Operational	Citations in IDB Operational Documents	The average share of IDB citations of publications about topic J, across all operational documents.

Reputational influence

The following formula represents the influence of knowledge in topic J on the IDB's reputation in digital media, as defined as the average of mentions in social media and digital news that cite a knowledge product in topic J for year i.

$$\text{Reputational influence}_{ji} = \frac{1}{N} \sum_{n=0}^N \text{Number of IDB mentions that cite an IDB Knowledge Product about topic J in the year } i$$

The measure refers to the number of posts in social media (i.e., tweets) or digital news articles that directly cite an IDB knowledge product, by linking to or referencing the publication, in a given topic in the year.

Policy influence

The following formula represents the influence of IDB publications about a topic J on the policy discussion (academic debate occurring in publications), as defined as the proportion of citations generated by IDB publications in a given topic in other published works of its total publications.

$$\text{Policy influence}_{ji} = \frac{1}{N} \sum_{n=0}^N \text{Number of IDB Citations about topic J in google Scholar in the year } i$$

The measure refers to the total number of academic citations of IDB publications about a given topic, as tracked in Google Scholar in last five years.

³ See Appendix 3 for a more detailed discussion on proposed metrics and availability.

Operational influence

The following formula represents the influence of IDB publications about a topic J in informing IDB operations, as defined as the average of the share of citations of IDB publications about a topic J in an operational document across all operational documents.

$$a) \text{ Operational influence } j_h = \frac{\text{Number of IDB Citations about topic J}}{\text{Total of Citations in the Operational Document (POD)}}$$

$$B) \text{ Operational influence } j_i = \frac{\sum_{h=1}^H \text{Operacional Impact } j_h}{H}$$

In calculation a, the numerator refers to the total number of citations of IDB publications about topic J over the total number of citations of publications in a given operational document. Then, the influence of topic J in a year i is understood as the average of the set of H of operational influence calculated in point a.

4.3 Index Normalization

Given that the current study proposes a single aggregate score to measure the influence of IDB knowledge products along three different dimensions, it applies normalization to each dimension prior to combining them into a single score by standardizing using Z-scores as:

$$Z_j = \frac{I_j - I}{\sigma(I)}$$

where Z_j is the normalized score at operational document level (for operational influence) or knowledge product level (for the other indicators) and I is the value of the raw indicator for the j -th. As a result, the following formula represents the proposed index to capture the knowledge influence in a given topic as the sum of the standardized indicators.

$$\text{Influence_Score}_{\text{year}} = \frac{Z(\text{operational impact}) + Z(\text{policy impact}) + Z(\text{Reputational impact})}{3}$$

4.4 Index Validity

To ensure that the index actually measures what it intends to measure, it is important to run validity tests.⁴ Some considerations proposed by Messick (1989) can be adapted to the present study. In particular, content (do metrics appear to be measuring the construct of interest?) and substantive validity (is the theoretical foundation sound?) belong to the index design stage and have been based on IPSOS interviews with internal IDB stakeholders and existing literature. Convergent validity could be assessed for some metrics by computing correlation scores with other data, such as downloads for each knowledge product, or by correlating citation metrics computed according to different methodologies. For the index-based score to measure what it measures consistently, it should also be tested for reliability.⁵

5. Knowledge Influence Score Proof of Concept

To carry out the proof of concept of the knowledge influence score, the present study focuses on two topics: (i) informality in labor markets and (ii) public expenditures. It identifies all publications tagged to these two topics and defines the time window for which the score is computed as January 1, 2018 to October 30, 2021. Of these, according to data from the IDB library, 184 publications have been identified as related to public spending and 54 to informality.

5.1 Selected Metrics for the Proof of Concept

This section describes the methodology behind each of the three metrics for which data are currently available.

Mentions in digital media

To filter data to capture media coverage of the IDB only as it relates to the knowledge, instead of capturing all exposure that could be generated by other actions, such as corporate communications or operational work, the relevant metric is the contribution of knowledge products to the IDB's reputation in digital media pertaining to a specific topic.

⁴ Construct validity checks that the selected metrics cover all dimensions of the construct. Convergent/discriminant validity demonstrates that the index is correlated or uncorrelated with other appropriate measures. External validity tests whether the index has the expected causal relationships with other theoretically related constructs (Spector, 1992; Diamantopoulos and Winklhofer, 2001; Coltman et al., 2008).

⁵ Indexes cannot be tested for reliability using Cronbach's α because that test assumes that a high pattern of correlations between the indicators is good, and a researcher might prefer that there be no correlation among the index indicators. Cronbach's α also assumes that the metric weights are equal. Instead, the researcher should check for multicollinearity between the metrics using variance inflation factors, confirm that they all have the same direction of their relationship with the construct (coefficients have the same sign), and ensure that the scale is unidimensional using only metrics that load onto the first principal component factor (Coltman et al., 2008).

This is computed following the approach in IDB (2018) and using data provided by Brandwatch, a digital media intelligence company that provides key metrics such as volume of mentions, net sentiment (ratio of positive to negative statements), and engagement with the content, by “scraping” publicly available content on social media (i.e., Twitter) and multiple digital news websites. The construction of this metric is conducted according to the following steps:

- Estimation of the volume of IDB mentions on social media for each topic (labor markets and fiscal policy) using queries already validated by past IDB practices and refined through appropriate filtering (geographical area, language). The social media activity identified through this step corresponds to digital media citations on a topic.
- Mentions are parsed to find IDB publications, basing the search on links to the Bank’s website. This is justified by the fact that, when tweeting, it is common to include links to the studies being cited. At the same time, the titles of the knowledge products can reach or exceed the maximum length allowed by a single tweet. Each link is then matched with a list of IDB publications classified as pertaining to informality or public spending, and each individual mention is recorded. This is a lower bound for mentions in digital media as some mentions may not include the link to the knowledge document.
- Mentions are aggregated by year, quarter, and topic (informality or public expenditures) and normalized using the metric computed in step 1.

In addition, all queries are filtered geographically, to include only IDB member countries, and therefore exclude conversations on the same topics that are conducted, for instance, in the European Union or United Kingdom.

Academic citations

In the proposed methodology, the number of citations per knowledge product is obtained through Google Scholar queries.⁶ Academic citations include the link to their source, which can be mined to extract a large array of information (e.g., year, article name, first author, and journal impact factor).

Citations in IDB operational documents

The IDB produces knowledge that it then refers to in other operational documents. Each operation contains a series of supporting documents used in the preparation, methodology, and application of the solution. It is possible to apply text mining and citation analysis techniques to understand how knowledge products are cited in this collection. This proof of concept uses data from a project carried out by the Bank’s

⁶ Google Scholar is a search engine that searches across many disciplines and sources: articles, theses, books, abstracts and court opinions, from academic publishers, professional societies, online repositories, universities and other websites.

Knowledge and Learning Division of the Knowledge, Innovation, and Communications Sector that analyzed 1,458 documents (loan proposals) to find citations of IDB knowledge products. Due to wide variability in citation styles, creating substantial issues for automated extraction, manual techniques were used to analyze loan proposals relevant for the creation of the knowledge influence score. Ultimately, 40 operational documents were included in the computation. Citations were identified through URL, title, and author surnames. Of 1,493 citations found in the documents, 59 directly referenced IDB documents and were analyzed to find mentions of informality and public expenditure knowledge products. The mentions were then aggregated by year and topic and normalized, as described in the previous sections.

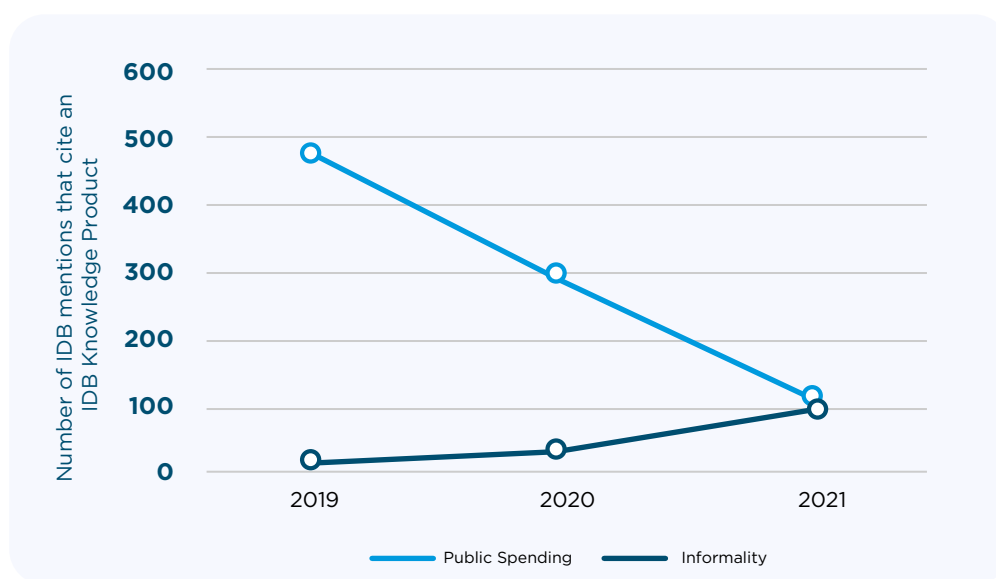
5.2 Proof-of-Concept Results

This section presents the results of the proof-of-concept knowledge influence score for two selected topics: (i) informality and (ii) public spending. It presents first the time series of the three indicators, examined singularly and then the combined score.

Reputational influence

The influence score for informality rose steadily across the three years of study (2019–2021), while the one for public spending steadily decreased, as shown in Figures 4 through 7. Given that the indicators are related to mentions in digital media of IDB publications, the results may have been influenced by the volume of publications released and disseminated in a given year.

Figure 4. Proof of Concept Results: Reputational Influence for Public Spending and Informality, 2019–2021

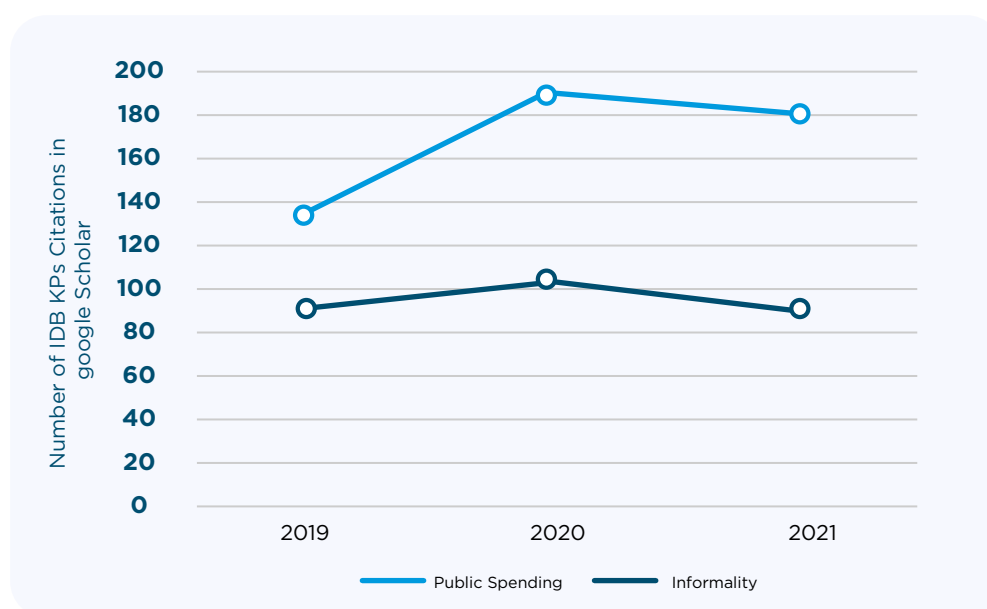


Source: Authors' elaboration.

Policy influence

Policy influence for both public spending and informality was quite stable across the three years considered, as shown in Figure 5. Interestingly, the number of citations for public spending products steadily over the time period, while the yearly number of citations for informality was constant around 100 hundred per year.

Figure 5. Proof of Concept Results: Policy Influence for Public Spending and Informality, 2019–2021

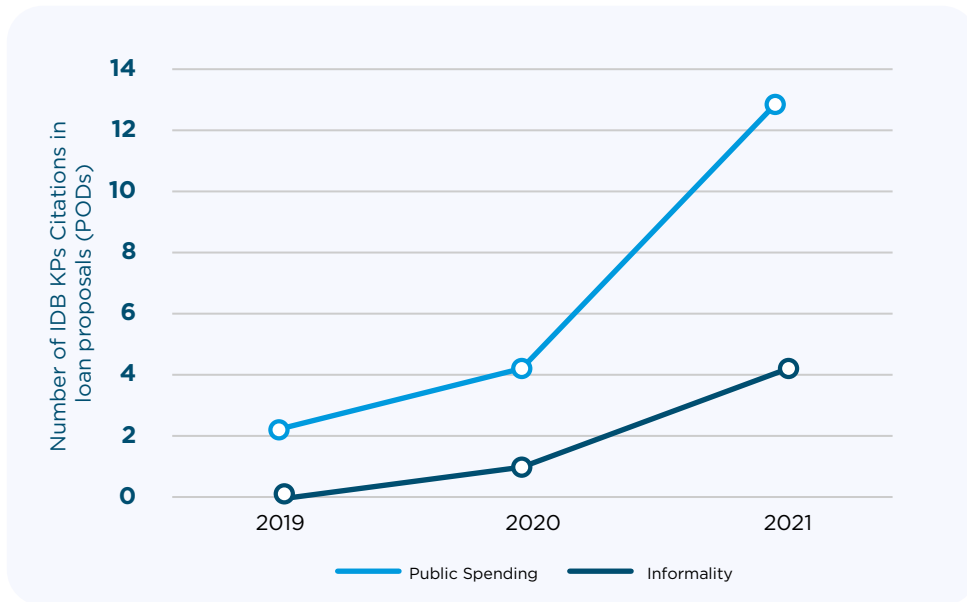


Source: Authors' elaboration.

Operational influence

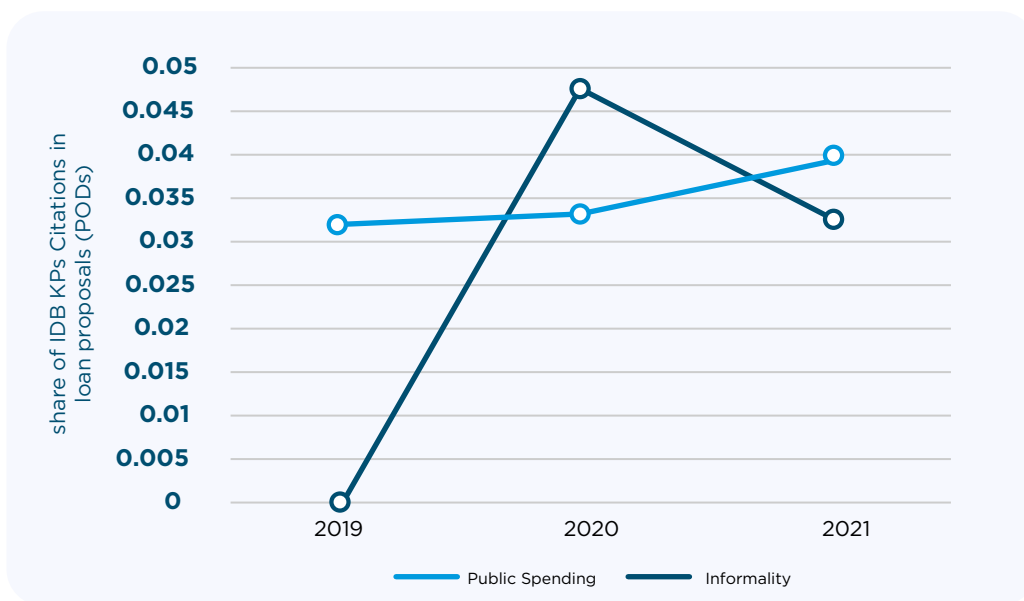
As no citation in operational documents was found for informality papers in 2019, the operational influence for that year was exactly zero. Even without that data point, there was a slight increase in the operational influence for these products between 2020 and 2021. The same was true, and the increase was greater, for public spending papers.

Figure 6. Proof-of-Concept Results: Operational Influence for Public Spending and Informality (levels) , 2019–2021



Source: Authors' elaboration.

Figure 7. Proof-of-Concept Results: Operational Influence for Public Spending and Informality (share) , 2019–2021



Source: Authors' elaboration.

5.3 Aggregated Results

The annual score for informality in the labor market rose from -0.13 in 2019 to 1.21 in 2021. The score for the public spending decreased from 4.8 in 2019 to -6.4 in 2021. Despite the decrease in the public expenditure aggregated score, this dimension shows a slight evolution in the operational score. Meanwhile, the informality dimension shows an increase in the reputation and operation dimensions (see Tables 2 and 3).

Table 2. Public Spending Influence Dimensions and Aggregated Scores

	Reputational	Policy	Operational	Influence score
	Levels	Levels	Share	Z-Score
2019	480	134	0.032	4.88
2020	277	187	0.033	1.57
2021	105	180	0.04	-6.64

Source: Authors' elaboration.

Table 3. Informality Influence Dimensions and Aggregated Scores

	Reputational	Policy	Operational	Influence score
	Levels	Levels	Share	Z-Score
2019	5	93	0	-0.13
2020	35	102	0.05	-0.89
2021	101	88	0.03	1.21

Source: Authors' elaboration.

5.4 Results

The purpose of this proof of concept has been to test the feasibility of these metrics on two topics. As such, the results are not interpretable on their own but demonstrate how the index could provide a baseline to measure the influence of knowledge over time by noting its growth or decline and relative strength of influence over time and against other topics.

6. Limitations and Considerations

This technical note aims to investigate a means to directly measure the effect of the Bank's explicit knowledge production activities, which in turn can help strengthen its capacity to deliver knowledge in line with its mission and to promote development based on evidence. However, there are important limitations and considerations to keep in mind in this first attempt to inform future efforts in building out the process.

6.1 Current Limitations

The knowledge influence score proposes a series of metrics that aim to capture the long-term influence of a single knowledge product on multiple dimensions (reputation, policy landscape, and operations) without focusing on a single static metric (e.g., downloads). However, the calculation of the proof of concept suffers from the unavailability of complete data sources for many of the proposed metrics, in addition to limitations in their calculations themselves, which are briefly summarized in this section.

Mentions in digital media

In providing a full count of IDB, this metric currently does not consider the sentiment of the mention and whether the mention expresses positive or negative views about the knowledge product. The current IDB platform to collect these data can automatically tag information according to this criterion. However, human supervision (e.g., checking the sentiments of a sample of posts) is required to ensure the accuracy and relevance to the IDB use case and context of this data. It is also important to note that, while comprehensive, the coverage of Brandwatch queries varies. As the metric reports proportions and not raw counts, it is likely that the estimates are not seriously affected by this phenomenon. However, convergent validation from other data sources (e.g., direct query to Twitter APIs, if possible) could be warranted. Finally, expanding the matches to include not only links to IDB websites but also links to pages that unequivocally discuss a single publication or knowledge product could increase the number of correctly identified mentions and therefore the accuracy of this metric.

Academic citations

Citations can originate from different sources, each with its own prestige and relevance. Citations can also originate outside the world of scientific publications, for instance by appearing in policy documents. The value and data quality of this metric could be increased by including subscriptions to services specifically designed to track publication citations across multiple sources.⁷ In particular, Google Scholar focuses mostly on academic citations, and does not cover widely citations from public policy sources, governments, and other institutions. Furthermore, discussions on citation analysis frequently mention that more papers and more citations do not always mean more impact or greater research quality. Therefore, citation data could be improved by weighting each citation based on its source (for instance, using the IF), and differentiating by citation origin (e.g., academic papers and policy documents). As the number of academic papers published increases each year, raw citation counts could rise simply due to the increasing scientific production in the sector. However, the

⁷ Such citation services could include [dimensions.ai](https://www.dimensions.ai/), which provides a database that offers the most comprehensive collection of linked data in a single platform, from grants, publications, datasets and clinical trials to patents and policy documents. Other sources that can be evaluated to reach this goal include other citations and abstracts databases (e.g., Scopus, Web of Science).

normalization step ensures that the policy influence component used in this score does not simply reflect a general increase in the number of published papers, but specifically the relative influence of the papers dealing with a specific topic. Lastly, not all IDB papers could be found on Google Scholar, nor do all papers have a digital object identifier (DOI), which can cause an undercounting of the real knowledge influence when evaluating the raw counts.

Policy influence

This metric suffers particularly from a lack of data. The assumption is made in this note that, if a publication is influential, it will be cited more often and the more it is cited, the more the knowledge will be accepted as mainstream and the higher the probability that it will catalyze policy change. However, in the absence of data that identify IDB citations in repositories more directly accessed by public policy audiences, such as policy documents, this measure is severely limited. Incorporating data on citations in official public documents will go a long way towards strengthening this metric and providing a more accurate and aligned response to the dimension's objective.

Mainstreaming in project documents

Automatically identifying IDB citations in the document has proven to be a complex task, given the heterogeneity in citation styles. While manual extraction maximized the accuracy of the outcome, it was not possible to obtain complete bibliographic information for all citations. Adopting a uniform citation style for online citations and/or including bibliographies in future documents would greatly improve the completeness of the data extracted.

Robustness checks

While efforts have been taken to validate the current metrics (through multiple data extractions), robustness checks on the knowledge influence score are recommended and discussed later herein.

Benchmarking

Providing a point of comparison with other institutions helps provide more insight into the relative strength of the IDB's knowledge performance as compared to its peers, particularly in the context where there are advantages to being a first mover or having subject-matter authority. However, given that some of the proposed indicators in the index require data that are not publicly available and that there is no consensus or systematization of knowledge objectives and measures across institutions, the knowledge influence score is currently not a tool for which the IDB may be able to benchmark itself against other peer organizations.

Manipulation

Some of the metrics, in particular citations in IDB operational documents, may be subject to influence by parties who can decide what gets cited in project documents or act strategically to increase the number of citations of particular knowledge products. In other instances, some knowledge products can be more aggressively promoted, leading to more citations, especially in social media. To mitigate these issues, the knowledge influence score considers a combination of metrics.

6.2. Future Development

The future development of the knowledge influence score is based on expanding the number of data sources and adjusting algorithms and methodology to strike a balance between sophistication and feasibility. This implies scaling up data collection initiatives (e.g., expanding feedback measures to all IDB publications), implementing new data collection procedures (e.g., asking users of IDB knowledge products whether they intend to apply the information contained therein), and in some cases introducing data collection in new business processes designed to capture information about the role of knowledge (e.g., tracking use in the development of business opportunities). The result of these efforts would be the availability of an index-based score that meaningfully captures the different benefits that knowledge brings to IDB operations and reputation, as well as its influence on political discourse and policy. This score could also, potentially, begin to shed light on the relative contribution of various knowledge products to that influence.

Other actions could be taken to improve the quality of the metrics that were used in this iteration by expanding access to additional data providers such as Lexis-Nexis, a data analytics and mining firm, or checking the suitability of altmetrics providers. Future versions could analyze the results using sentiment analysis to correct accordingly, for instance, by subtracting, rather than adding to the total influence, the tweets characterized by a negative sentiment.

Finally, the robustness of the knowledge influence score could be tested using different approaches, such as: (i) testing the stability of the factor (or component) structure obtained through application of dimensionality reduction techniques to data gathered in different time windows, (ii) verifying whether the metrics reflect real-world events such a surge of attention for an IDB knowledge products, and (iii) including IDB knowledge products in legislation.

6.3. Additional Issues in Measuring Knowledge Influence

There are additional issues to consider when aligning the knowledge influence score with best practices in communication evaluation and measurement, which should emphasize how knowledge products can lead to behavioral change, rather than focusing solely on outputs or volume. An understanding of the knowledge lifecycle, or timeframes associated with its influence, is essential to constructing an accurate measurement tool. In fact, metrics and weightings should consider the time horizon over which interactions occur, because influence does not happen instantaneously, even with the accelerated timeline stimulated by social media (Pulido et al., 2020). When evaluating citations, there is evidence that older articles were cited more by traditional research sources but did not gain more online attention over time. At the same time, recent articles received zero citations despite receiving notable online attention (Dardas et al., 2019). The long window adopted in this POC reflects both short-term (share of voice) and long term (citation) influence, albeit in two different domains. The compound score at any point in time is therefore the sum of processes with different time scales and lags. Considering each dimension separately might be a better option when the focus is on a specific time scale.

7. Conclusions

This technical note details the IDB's first attempt to develop a methodology to measure the knowledge influence of its products of promoting social and economic development in LAC countries. In this exercise, the methodology defines knowledge influence as its capacity to influence the integration of evidence into policymaking, as shown by the IDB's reputation, policy decisions in member countries, and generation and design of operations and development strategies in countries and sectors. This note proposes the construction of the knowledge influence score, which is made of three dimensions: reputation, policy, and operations. At the same time, the exercise has raised methodological questions regarding what exactly can be measured, when it can be measured, and how to measure it. These questions relate to three key areas.

- **Granularity versus scalability:** There is an inherent tension in the IDB's business model as a multilateral that complicates the selection of a unit of analysis that meets the goal of both producing an index that is meaningful while at the same time feasible to deliver on an ongoing basis to inform business decisions. If the unit of analysis is narrow, such as measuring the influence of a single publication, there is a considerable scalability challenge given the large volume of IDB knowledge products each year. In addition, a single publication will not provide information about the Bank's performance, given that it will rarely have a significant isolated influence. Instead, a

publication is typically one piece of a larger strategy. On the opposite end of the spectrum, a broad level of analysis, such as a consolidated—or aggregate—measure of all IDB knowledge, is more feasible and provides a better idea of the scope of its knowledge influence, but it will not meet the demand for a meaningful and actionable influence measurement by operational departments seeking to use these data to inform and measure specific knowledge agendas and production.

- **Taxonomies:** The POC sought to find a middle ground between knowledge product and organizational aggregate by building a sample index for the two topics of public spending and labor markets. The thinking behind this approach is that several knowledge products can be consolidated to show influence in a topical agenda, which is more aligned and actionable to the operational business teams. The IDB faced challenges in mainstreaming such indices related to taxonomies. The nature of the public policy areas addressed by its knowledge products complicates clear and consistent delineation among topics. Several products may be included in more than one topic and the Bank is not consistent in applying the same taxonomies across databases.
- **Systematic data collection:** Another important challenge highlighted in the POC exercise was the lack of systematic data collection to feed the index. The index proposes several metrics for which the IDB does not currently have information because several processes regarding knowledge production and dissemination are not fully digitalized, and activities recorded on a systematic basis.

Given these limitations, this note proposes the operationalization of a knowledge influence score at an organizational level (all IDB knowledge products). This will allow the IDB to see the scope of its knowledge influence and see how it evolves over time. At the same time, the IDB must understand how to disaggregate the score to a more granular level so that the score can help inform knowledge agenda planning and dissemination in operational departments. In addition, the IDB must incorporate additional measurements that allow for benchmarking knowledge influence scores against peer institutions to provide more insight into the interpretation of the score.

To advance in the production of these indicators, the Bank should scale up its data collection, relying on both in-house efforts and collaboration with third-party subject matter experts. It is also important to build institutional support among different IDB internal stakeholders to formalize this model in operational practices, providing feedback on its relevance and promoting its adoption.

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Appendix

Methods of Valuing Knowledge

Financial methods for valuing intellectual capital include Tobin's Q (ratio of market value to asset value), economic value added (value of employees' recruitment and training or the cost of buying their services) or value-added intellectual capital (ratio of net sales to labor expenses). Human capital methods typically score organizational capabilities with respect to leadership, culture, values, and strategy and then correlate the human capital score to financial or strategic performance. Intellectual capital methods generally apply some or all of the following steps: classifying different components of intellectual capital; selecting quantitative metrics to measure each type; aggregating the metrics into a score; and then correlating the score with the organization's financial performance. Performance methods focus on measuring the impact of knowledge, either by focusing on measures of successful implementation of knowledge management processes (e.g., knowledge management system usage, number of internal discussion communities) or outcome measures of the results of successful knowledge management.

A Review of Knowledge Measurement in MDBs

The work of Menou (1993; 1995) and the International Development Research Centre (IDRC, 1995) highlight the need to measure the effect of information on development and IDRC (2019) reinforces the importance. The IDRC framework captures the linkages between diverse information input factors and output benefits (Horton, 1994). It involves defining the user community and the subject of impact (e.g., development issue or program), defining the journey and lifecycle of information, clarifying the information use environments, developing research guidelines, assembling the data, and identifying specific inputs, outputs, and outcomes to be included in the analysis. It encourages the use of assessment metrics that evaluate performance, effectiveness, cost-effectiveness, benefit, and impact of usage.

Another approach to measuring impact can be found in the AidData Listening to Leaders longitudinal research series (Custer et al., 2018; 2021), which analyzes the impact of technical assistance on development cooperation and aims to understand the relationship between policy advice and the setting of policy priorities. In a series of surveys, leaders⁸ from different institutional contexts evaluate the degree to which MDBs influence the policy agenda of partner countries, provide useful advice, and how helpful MDBs are in the project implementation phase. Survey questions ask about respondent's policy focus and experience in working with MDBs and other development partners. The metrics used in the project concern the influence and helpfulness of multilateral development banks and bilateral aid agencies, and they can be useful for evaluating the impact of the IDB's knowledge and comparing perceptions of the IDB to other MDBs.

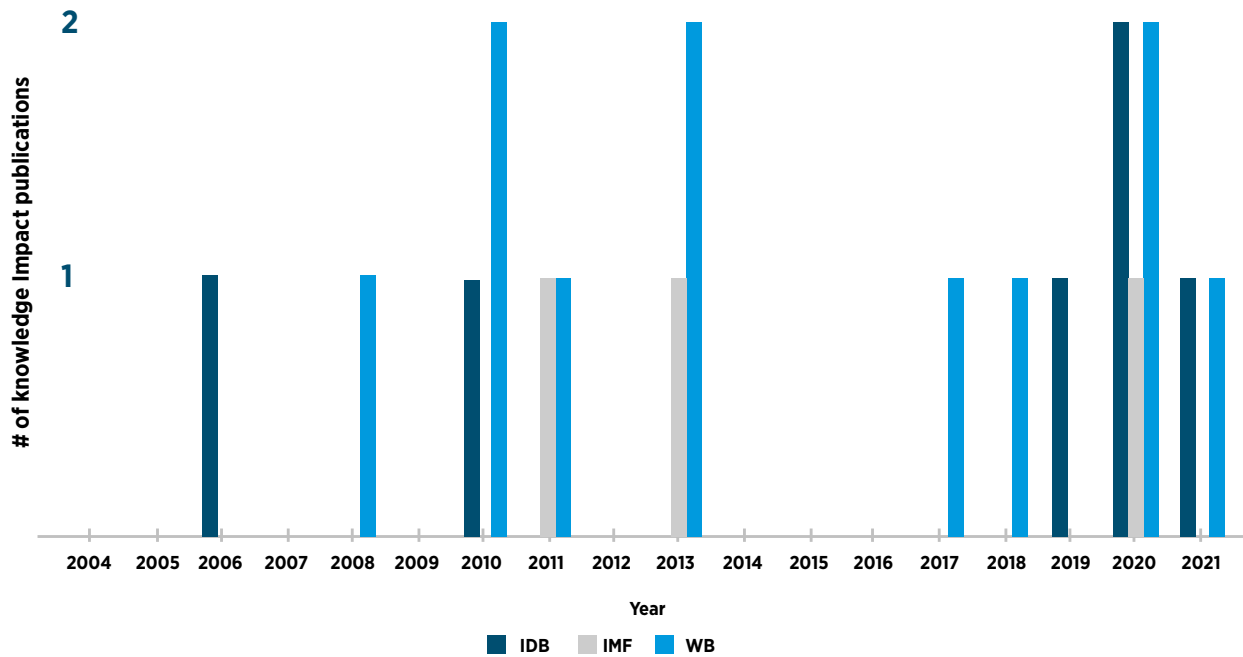
⁸ 3,500 leaders working in 22 policy areas including government officials, parliamentarians, local representatives, NGO leaders, educational and media leaders, and other stakeholder groups

respondent's policy focus and experience in working with MDBs and other development partners. The metrics used in the project concern the influence and helpfulness of multilateral development banks and bilateral aid agencies, and they can be useful for evaluating the impact of the IDB's knowledge and comparing perceptions of the IDB to other MDBs.

Prizzon, Josten and Gyuzalyan's (2022) survey of senior government officials and MDB country office staff does not examine knowledge impact directly, but it reveals client countries' preferences for knowledge (technical assistance, policy advice and research) versus other support (financing, convening). It compares government officials' opinions of preferred types of support and relevant sectors with what MDB officials perceive to be important. In general, they recommend that MDBs pay more attention to the long-term impact of technical assistance and policy advice, the timeliness and flexibility of that advice, and the independence/impartiality of advice, as government officials prioritize those issues far more than MDB staff currently do.

Other than Aizenmann et al. (2011), who compares the academic citations of research by IMF staff to those in peer institutions, no other studies seem to compare knowledge impact among MDBs. The knowledge impact evaluation literature is sporadic, based on broader development accountability agendas, and largely siloed within individual institutions. An example of that sporadic tendency is World Bank (2011) which followed the publication of its then-updated knowledge strategy in 2010. The report says it is the first in a series of World Bank Knowledge Reports, yet it was not possible to locate any of the reports that followed. However, based on the total number of publications on this topic, the World Bank appears to evaluate its knowledge impact more frequently than other MDBs.

Figure A1. Number of Knowledge Impact Publications at Select MDBs by Year



Source: Authors' elaboration.

The present study reviews prior work in knowledge measurement by the IDB, World Bank, International Monetary Fund (IMF), and Asian Development Bank (ADB), comparing how these peer institutions define and measure knowledge as well as how they have attempted to measure knowledge impact in particular.

Table A1. Comparative Summary of Knowledge Measurement at Select MDBs

	IDB	IMF	World Bank	ADB
Definition of knowledge	<p>Knowledge is key to the IDB's competitive advantage. Knowledge takes two forms: systematized and not systematized.</p> <p>Knowledge products include books, databases and datasets; discussion papers; learning materials; monographs; policy briefs; technical notes; working papers, and knowledge-sharing events (see Section 2.a).</p>	<p>Formal definition of knowledge not provided.</p> <p>Two types of research: surveillance-oriented publications (applied research, reports, policy papers) and academic-style IMF publications (working papers, journal articles, books, and conference volumes) (IMF, 2011).</p>	<p>Knowledge is the World Bank's core strategic asset.</p> <p>Three broad categories of knowledge: knowledge for external clients, knowledge as a public good, knowledge for internal use (World Bank, 2010). The World Bank (2021) defines all its products as knowledge products, but more specifically refers to "those activities that are designed explicitly to create, codify, and pass on knowledge," and categorizes knowledge by geographic region.</p>	<p>Knowledge takes three forms: explicit, implicit, and tacit.</p> <p>Explicit knowledge includes books, documents, databases, Web sites, courses, and emails. Implicit knowledge includes shared beliefs, values, and expectations. Tacit knowledge includes interaction, debate, and trial and error.</p>
Meaning of knowledge	<p>Improving the effectiveness of IDB's lending program and policy dialogue, responding to specific client demands, filling knowledge gaps and identifying emerging development challenges in the LAC region, fostering a culture of learning in the institution, disseminating lessons learned and best practices (IDB, 2019).</p>	<p>To establish stronger relationships between IMF and member countries, which is not part of the IMF's official mandate but part of its strategy (IMF, 2013).</p>	<p>To improve the Bank's ability to capture, create and deliver knowledge to its clients, make the Bank's knowledge products more impact driven, and strengthen the Bank's global connector role.</p>	<p>To foster a knowledge-supportive environment. A corporate culture that values learning and knowledge sharing.</p>
Importance of knowledge measurement	<p>Provides answers to questions about prioritization, strategy, use of resources, resource allocation, ROI on knowledge production, aligning with institutional strategy and promoting development</p>	<p>Little information publicly available</p>	<p>Manages the knowledge generated, provides better access to internal and external stakeholders in order to maximize impact (World Bank, 2018).</p>	<p>Manages the knowledge generated, provides better access to internal and external stakeholders in order to maximize impact</p>

	IDB	IMF	World Bank	ADB
Current state of knowledge impact measurement	Net Promoter Score, measuring number of publication downloads and citations, internal and external stakeholder perception surveys, relationships between publications and social media mentions (see Section 3.b.i.).	Little information publicly available	Maintains a Strategic Research Program framework to evaluate research on key themes and gather evidence of non-lending services' impact on country policy priorities (World Bank, 2021) However, the World Bank lacks definitive metrics for relevance, quality, and impact of knowledge products, despite earlier independent assessments, such as World Bank (2013). World Bank (2021) focuses on appropriateness of inputs: (i) adequate resourcing, (ii) client engagement, and (iii) appropriate human capital.	Strategic Research Program framework to evaluate research on key themes, Evidence of non-lending services' impact on country policy priorities

Source: Authors' elaboration.

Inter-American Development Bank

This review focuses on a specific subset of systematized knowledge that has been subject to a formal IDB internal review process and aligned with knowledge agendas defined in internal IDB strategic documents. These knowledge products are available in the form of books (commercial and non-commercial), databases and datasets, discussion papers, learning materials, monographs, policy briefs, technical notes, working papers, papers published in peer-reviewed journals, and knowledge-sharing events (courses, regional policy dialogues, etc.).

In 2006, the IDB recognized the potential relationship between what it then called “non-financial products” and the international development process. An evaluation of the IDB’s research studies conducted at that time examined measures of successful implementation of knowledge management processes rather than knowledge impact or development effectiveness. The evaluation considered the extent of budgeting and planning for studies, internal research synergies, dissemination methods and value for money spent, particularly on consultants. The IDB evaluation found that 56 percent of IDB journal publications had never been cited, published IDB studies were cited less than publications from peer DFIs, IDB authors did not sufficiently cite other IDB authors and that the IDB was not effectively measuring the utilization of its studies. The evaluation also noted that the World Bank and the IMF had already been systematically collecting knowledge measurement data for years and had published

evaluations concerned with knowledge outcomes and impact measurement such as publication quality, cost-effectiveness, and contribution to operational effectiveness.

A 2010 evaluation of IDB knowledge (IDB, 2010) looked specifically at the Country Studies Initiative and whether the knowledge and capacity building products resulting from the initiative met the Bank's knowledge strategy. The evaluation used citations and a survey of IDB project team leaders to assess whether the country studies were more likely to be utilized within the Bank, by the Bank's clients or the academic community. The evaluation found that IDB studies were less cited both internally and externally than at peer institutions.

More recent IDB knowledge measurement efforts (IDB, 2019; Ipsos, 2021a) also address knowledge generation and dissemination. These evaluations find that the IDB's knowledge products are generally used, cited, and positively perceived by internal and external stakeholders. There is a consensus within the Group that knowledge is key to the IDB's competitive advantage. However, it is difficult to evaluate the cost-benefit of knowledge products in the IDB context as well as the extent to which knowledge activities advance the IDB's strategic objectives. There is also an uneven distribution of knowledge citations and downloads, which suggests that budget resources could be more effectively allocated by topic or region (also by publication language, see Avellán et al., 2021).

To gather some information about knowledge impact, the IDB has adopted the Net Promoter Score (NPS), a widely used market research metric that evaluates customer satisfaction and loyalty using a single question of how likely customers are to recommend the organization to others on a scale of 0 to 10 (Reichheld, 2003). In the IDB's Client Satisfaction Survey (Ipsos, 2021b), the NPS measures external stakeholder perceptions of the IDB (including government officials and representatives, non-profit leaders, private partners) as a knowledge provider with the following question: "Based on the experience you have had with the IDB Group, if a colleague or person who is in a position similar to yours asks you for a recommendation of a provider of relevant knowledge, how likely is it that you will recommend the IDB Group?" An analysis of the IDB's NPS scores indicates that drivers of satisfaction with the Bank as a knowledge provider include demonstrating sector-specific knowledge and technical expertise. These factors suggest ways that the IDB can structure knowledge production to increase stakeholder impact.

Recent IDB analysis (Avellán et al, 2021) has gone beyond measuring publication downloads and citations to examine the factors that increase downloads (publication language that aligns with target audience, regional over country focus, publication format, etc.). The next step in knowledge measurement is to link the IDB's knowledge management activities to audience perceptions or other measures of knowledge impact, such as influence on public policy.

World Bank

The World Bank (2016) groups its knowledge services into three types: knowledge for external clients (analytical and advisory for country audiences), knowledge as a public good (research papers, data and reports for global, and regional audiences), and knowledge for internal use by Bank staff. The strategy states that knowledge is the Bank's core strategic asset and suggests that the Bank's path to impact is as a global connector of knowledge, policymakers and practitioners. It also assumes that the World Bank has the scale, in-house capacity, sector expertise and country insight to create customized solutions to development challenges (World Bank, 2011). World Bank (2018) explicitly mentions that the goal of the Bank's knowledge management is to maximize its impact for clients through better access to information both internally and externally.

The World Bank has a more in-depth, but still limited, track record of knowledge measurement compared to other MDBs. World Bank (2008) studies the Bank's economic and sector work and non-lending technical assistance differentiates between knowledge outputs (volume, type, quality, dissemination), knowledge outcomes (research and technical assistance measures, such as informed public debate and strengthened institutions) and knowledge impact on development outcomes (growth and poverty reduction). That evaluation focuses on measuring the outcomes rather than the impact laid out in the evaluation framework. Using interviews with and surveys of Bank staff and stakeholders, along with counterfactual analysis, the evaluation measures knowledge outcome metrics related to the knowledge outcome objectives. For example, the extent to which economic and sector work informed public debate is measured by how widely the media reported the analysis and whether major stakeholders reflected on World Bank perspectives in interviews. The evaluation also suggested measuring the strengthening of institutions through increased effectiveness in managing operations and increased ability to monitor and evaluate operations, although no specific metrics were suggested.

World Bank (2011) highlights a contradiction between the perceived importance of knowledge services and lack of resources for such services relative to lending. Based on surveys, World Bank clients perceive knowledge services as the most valuable contribution over financial resources. However, producers of knowledge work are incentivized to pay more attention to technical quality rather than engagement with audiences, even though the latter factor is the key to high impact. The report also asserts that each of the knowledge product lines should have results frameworks and measurement systems put in place. Unfortunately, this series appears to have been discontinued and the World Bank later assessed its own implementation of results frameworks as inconsistent.

Few World Bank projects have been subject to formal knowledge impact evaluation methods. One possible reason is that individual countries may not be willing to bear the private cost of funding the evaluation. This points to an important role for the World Bank Group in providing internal resources to evaluate key knowledge products. In other cases, such as large country-wide macro reforms, creating a counterfactual or control group is not possible, which makes knowledge impact measurement more challenging.

World Bank (2010) assesses knowledge-based activities from 9 country programs (selected from 48 of the knowledge-intensive programs supported by the World Bank). The goal is to understand how to enhance its value proposition in knowledge-based partnerships, delineate goals and instruments of knowledge-based country programs, and leverage engagement in knowledge-based country programs.

The programs are assessed using four criteria: (i) relevance (Does the knowledge product meet the recipient's needs?); (ii) technical quality of the knowledge activities and their effectiveness in conveying the World Bank knowledge to recipients; (iii) results (Do the activities reach their objectives? Can the results be traced to the Bank?); and (iv) sustainability of results (Will the knowledge activities have a lasting impact? Is there a measuring framework?). These criteria are used as measures of whether the knowledge activities are likely to have lasting impacts on policies, capacity, or institutions after their completion, and whether an appropriate framework was in place to monitor results over time. The focus is on operational and policy-making results, as well as on fostering long-term knowledge partnerships.

This approach to results contrasts with results frameworks for attributing impact that have been more recently applied to specific topical knowledge programs at the World Bank and evaluated using the Strategic Research Program framework (World Bank, 2017; 2021). The SRP finances research in seven key themes: (i) private sector development and entrepreneurship, (ii) financial development, (iii) education, (iv) trade and globalization, (v) agriculture and rural development, (vi) infrastructure and transport, and (vii) poverty and inequality. The framework compares three types of knowledge outputs: (i) quality research (working papers, peer-reviewed journal articles, policy briefs, analytical tools), (ii) research that responds to stakeholder demand, and (iii) competitively tendered research.

For example, World Bank (2017) combines a qualitative project-by-project review with measurements of key impact metrics such as research citations, policy citations, impact on partner government policy, and usage of analytical tools. Although the SRP measurement framework differentiates between outputs, outcomes and impact, impact seems to be defined as longer-term outcomes. Only the impact on partner government policy metric addresses the evidence of change that demonstrating impact requires.

World Bank (2021) recognizes that most Bank activities can be considered to be knowledge-based and that research or policy advice form part of knowledge activities. The report points out that, following the Covid-19 crisis, the World Bank needs to acquire and disseminate the knowledge that will help its clients meet the ever more demanding development needs in a world shaped by new technologies that can increase the impact of knowledge and emergence of new players in the development economics knowledge space. However, it also notes that measuring the relevance, quality, and impact of knowledge products suffers from the lack of definitive metrics, which is true for research papers and analytics services, as well as less explicit knowledge and quick response notes or just-in-time policy advice at the tip of the knowledge iceberg. World Bank (2021) therefore focuses on the challenges linked with the inputs of the knowledge creation process (human and financial resources as well as client engagement). These aspects tie back to the objectives mentioned in the other World Bank reports mentioned herein, including strategic outreach focused on actionable recommendations and implementation, improving knowledge flow, collaboration and reuse inside the World Bank, strengthening the World Bank's human capital, and increasing the World Bank's ability to learn from its previous operations.

To increase the impact of the World Bank's knowledge, World Bank (2021) envisions a strategy based on three pillars: strengthening systems (i.e., learning from projects, strategic prioritization, and quality assurance), internal incentives, and human capital (career paths, training, and selection). The need to measure the quality and impact of knowledge products and staff capabilities remains a strategically important cross-cutting topic, and strengthening measurement is essential to benchmarking progress in the framework implementation.

Knack et al. (2020) directly addressed the question of the relationship between World Bank research and policy influence. Although the World Bank spends 150 times more on lending than it spends on knowledge and advisory services, the authors demonstrate that non-lending services (measured by specific policy-oriented knowledge products) have more influence on low and middle income client countries' policy priorities than lending instruments (based on the same survey of public officials as the AidData Listening to Leaders Series), while controlling for policymaker characteristics, country, policy domain, and time period. The results show that the World Bank's analytical and advisory services not only affect the direction of government policy but also its design and implementation.

International Monetary Fund (IMF)

There is limited publicly available information about knowledge measurement at the IMF. An independent evaluation (IMF, 2011) of the relevance and utilization of research at the IMF divides research into surveillance-oriented publications (applied research, reports, and policy papers) and academic-style publications

(working papers, journal articles, books, and conference volumes). The report combines document reviews, IMF staff and stakeholder interviews, surveys, and citation analysis to measure perceptions of relevance and use of research by theme, country and format, technical quality of research, and perceptions of the management of research. It finds that the IMF's research relevance and use at the time were limited due to lack of collaboration with country officials, uneven research quality, and an assumption that IMF recommendations follow its messaging points rather than the research results.

Aizenmann et al. (2011) compare the IMF's journal and working paper citations to seven peer institutions, including the World Bank, OECD, and IDB. Controlling for time lags, organizational size, the large number of papers that are never cited, and self-citations, IMF working papers are cited less in the short term than those of the Federal Reserve Bank included in the study, but more than other international financial institutions. In the long term, IMF working papers make their way into journal publication at about the same rate as World Bank papers, but less than those of the Federal Reserve Bank. As seen elsewhere, research performance over time is interpreted as research impact without providing evidence of attitudinal or behavioral change.

Schwartz and Rist (2016) lay out a theoretical model whereby IMF knowledge products can lead to impact. The IMF's role as an advisor is not part of its official mandate, but it is repeatedly mentioned in internal strategy documents. The objective is for the IMF to have a stronger relationship with member countries which then leads to more effective policy adoption and international cooperation. The report hypothesizes that policy dialogue in the form of research and technical assistance increases confidence and trust in the IMF, which, controlling for a favorable policy environment, increases traction for the fund's advice or the likelihood of its adoption.

Asian Development Bank (ADB)

There is limited publicly available information about knowledge measurement at the ADB, and it was not possible to identify any research specifically about measuring knowledge impact. ADB (2004) reviews internal knowledge management practices and lays out a four-step process of knowledge generation and dissemination: (i) knowledge creation and capture, (ii) knowledge sharing and enrichment, (iii) information storage and retrieval, and (iv) knowledge dissemination. The knowledge measurement framework designated the desired impact as the ADB's improved capacity to reduce poverty and stated that impact follows from improved knowledge creation, dissemination, and transfer outcomes. The report also recommends that the knowledge outcomes be measured by performance in an external ranking (most admired knowledge enterprises) and pre- and post-evaluations of knowledge products. From 2005 to 2012, the ADB ran a survey of staff perceptions of its

knowledge management implementation process on the eight most admired knowledge enterprises dimensions.

ADB (2012) evaluates the knowledge management process by creating an overall weighted score of three performance dimensions: (i) the ADB's responsiveness to its knowledge management agenda, (ii) results achieved in each step of the knowledge management cycle, and (iii) relevance to knowledge stakeholders. The ADB's sub-score on each dimension is based on sub-criteria that the ADB evaluates using desk review, interviews, and survey data. This approach resembles this technical note's methodology (see Sections 4 and 5) of classifying the performance dimensions, selecting metrics to measure each dimension, and aggregating those metrics into a score.

Knowledge Influence Score Metrics, Current and Proposed, and Data Sources

The knowledge influence score contemplates a set of proposed metrics to measure along the three key dimensions. However, not all of these metrics are operational at present. The following tables describe each metric in more detail with current and potential data sources and limitations.

Table A2. Reputation Impact

Metric	Rationale	Data source
Mentions in digital media	<i>If the IDB produces influential knowledge, its knowledge should be cited more often on digital media platforms, indicating the IDB's importance as an authority in the subject matter.</i>	Mentions of the IDB in publicly available platforms including social media, digital news and blogs as monitored using Brandwatch (social listening platform)

Table A3. Additional Proposed Metrics to Add to the Reputation Sub-Score

Metric	Rationale	Data source
Net promoter score (NPS) for the IDB as a knowledge provider	<i>If the Bank produces influential knowledge, its NPS score should be higher, indicating that respondents will be more likely to recommend it as a provider of knowledge solutions.</i>	A NPS measure is included in the IDB's External Feedback System (EFS), an annual client satisfaction survey. This measure asks clients to rate their likelihood of recommending the IDB as a provider of relevant knowledge. However, this measure is currently only asked of IDB clients, which are defined as those people who have directly engaged with the IDB in a transaction such as a loan or technical cooperation. Knowledge products are often shared among a broader audience of influencers, think tanks, and NGOs that may develop a perception of the IDB. This measure also does not make an explicit connection between the consumption of knowledge and the likelihood to recommend, therefore it is difficult to evaluate the relative contribution of knowledge on the respondent's evaluation of reputation.

Metric	Rationale	Data source
Media requests	<i>If the Bank produces influential knowledge, it is more likely to be contacted by the media for comments on a given topic, indicating the recognition of the IDB as a subject matter expert.</i>	<p>Some partial data on media requests for interviews received has been collected manually. This information is not yet collected systematically across products and topics.</p> <p>For future inclusion, consistent tracking of this information is recommended.</p>
Score in knowledge product satisfaction surveys	<i>If the Bank produces influential knowledge, it will likely score higher in perception-related measures included in knowledge product satisfaction surveys.</i>	<p>One proof-of-concept study was conducted on the IDB flagship publication Development in the Americas (DIA) on Infrastructure Services in 2020. Information was obtained from individuals registered in the IDB's subscriber base who had downloaded the publication regarding their overall satisfaction with the publication, usefulness of the information included, applicability of information to development challenges and whether it denoted the Bank's technical expertise.</p> <p>The survey has not been scaled across other IDB knowledge products.</p> <p>The IDB employs a series of post-course completion surveys to evaluate its courses. However, these surveys do not include reputation-related question.</p> <p>For future inclusion, it is recommended to implement a large-scale surveying mechanism that will include, among other questions, an understanding of perception of the organization based on the knowledge obtained.</p>

Table A4. Policy Impact

Metric	Rationale	Data source
Academic citations	<i>Influential knowledge will be cited more often in other academic works. The more citations, the more the knowledge is accepted as mainstream and the higher the probability that it will catalyze policy change.</i>	<p>Data on citations of IDB knowledge products in other knowledge products is available through different sources, including Google scholar, RePec (through its Citations in Economics database) and commercial citation indexes.</p> <p>RePec focuses only on indexed academic journals and Google Scholar is freely accessible, and also includes citations contained in theses, books, abstracts, court opinions, professional societies, patents, and other sources usually classified as "gray literature", that are not easily tracked using other means. In some instances, Google Scholar can retrieve citation data for knowledge products not indexed in other databases, therefore reducing the occurrence of missing data. However, Google Scholar is considered "noisier" than other indexes, as it does not eliminate auto-citations and may include references of authors with the same name.</p>

Table A5. Additional Metrics for Future Development to Add to the Policy Sub-Score

Metric	Rationale	Data source
Intent to apply knowledge	<i>Influential knowledge can motivate policymakers to translate the knowledge into policy and interventions in their countries.</i>	<p>No systematic measure of intent is currently being used by the IDB, although a similar question has been introduced in the annual satisfaction survey, in level 3 surveys for IDB courses (Kirkpatrick Model) and on an ad hoc basis after some events.</p> <p>For future inclusion, it is recommended that a systematic surveying system be introduced and added to our existing evaluation model that asks knowledge consumers about their intent to apply the information.</p>
Citations in official public documents	<i>Influential knowledge can incentivize governments to implement new ideas, which should be reflected in official documents such as policy briefings, legislation, strategies, and budgets</i>	<p>The Bank has conducted previous efforts to mine official gazettes for mentions of the IDB and relevant topics in a select set of countries.</p> <p>For future inclusion, this initiative would have to be expanded in scope to additional official data sources where the IDB has the possibility of being cited. It would also need to include additional countries and an updated algorithm capable of incorporating terms of interest to this effort, including citations of the IDB in these documents.</p>

Table A6. Operational Impact

Metric	Rationale	Data source
Citations in IDB operational documents	<i>Influential knowledge will be cited more often in new operations as a source of evidence.</i>	The IDB has developed a methodology to identify citations of IDB knowledge products and gain a preliminary view into how knowledge products figure into the operation development process, with the goal of eventually understanding how knowledge is used to support the design of the approach described in the project document.

Table A7. Additional Metrics for Future Development to Add to the Operational Sub-Score

Metric	Rationale	Data source
Operational opportunities (leads)	<i>If the knowledge is influential, it will motivate our clients to seek business opportunities with the IDB to apply the knowledge in the form of an operation.</i>	<p>See reference in the policy sub-Index.</p> <p>There is no current systematic measure of this occurring at the IDB, although a similar question has been introduced in the annual satisfaction survey and on an ad hoc basis after some events.</p> <p>For future inclusion, it is recommended that a systematic surveying system be introduced that asks knowledge consumers about their intent to apply the information.</p>

Metric	Rationale	Data source
Contribution to operations generated	<i>If the knowledge is influential, it will be involved or included in new IDB operations.</i>	There is no systematic tracking of knowledge products as they are used in the operations generation pipeline. For future inclusion, it is recommended that a process be implemented to track how knowledge products are used in pre-operation dialogue. The IDB's Customer Relationship Management (CRM) platform could provide this functionality.
Improved project execution and results	<i>If the knowledge is influential and successfully incorporated into the preparation and execution of future operations, we would expect to see improvement in the execution and the results obtained.</i>	The IDB has a unique subset of documentation that packages lessons learned with the intention of informing execution of future operations. However, this documentation has not been analyzed systematically to determine its impact on project results. This potential utility of this existing documentation should be considered in future deliberations about how to address this metric.

Figure A2. Conceptual Framework to Build a Knowledge Influence Score

