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Attracting sustainable finance in megaproject development- Literature review, guidelines, and further development

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GEOTECNICAL CIVIL ENGINEERING

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1 Abstract

Megaprojects are complex entities, voluntarily or involuntarily touching many different aspects. Unfortunately, the desired results are not always achieved. Complexity and lack of results leave a gap in the structure of megaprojects; this gap can and should be filled by the development of a sustainable management method.

Sustainability is a broad concept that can be applied in countless fields; we are not only talking about the environment but also its social dimension. Nowadays, striving to implement a sustainable approach is increasingly fundamental and necessary. Sustainability and megaprojects do not have a direct connection, but they are two entities that belong together, and their integration is crucial for the advancement of technical and social integration of human beings.

Huge amounts of economic resources are required for the execution of megaprojects. There are a variety of ways to obtain financing, one of which is to go through one or more IFIs (International Financial Institutions), which precisely because of the massive nature of megaprojects and often international megaprojects lend themselves well to the performance of this task.

In the banking sector, too, the role of sustainability is growing; to access certain funds, one must fall within certain criteria and be able to demonstrate a willingness and commitment to sustainable development. Rules and guidelines exist to establish the criteria to be observed, thanks in part to the growing concern of governments about the issue.

Although there is a system in place to ensure sustainable execution of megaprojects, the reality of the facts is far away from the theory. Every conceivable regulation works on paper but then it is a different matter to put it into practice. In the case of megaprojects, this disparity is even more evident, given their intricate and complex structure.

Thus arises the need to have rules that can, in a simple way, ensure the implementation of sustainability at all levels of megaprojects. It is no longer just a matter of being eligible with the sustainability criteria of the financing entities, but of transmitting these guidelines to all the stakeholders and at all levels of megaprojects.

In civil engineering megaprojects, especially for the execution part of the work, awarding is done through competitive bidding. Implementing sustainable regulation at the tender stage, valuing the sustainable development of project execution without

penalizing the resulting excessive costs, gives private companies the opportunity to employ their resources in the study of sustainable, competitive, and innovative solutions.

Keywords: megaprojects, sustainability, IFIs, tender offer, bidding, guidelines.

2 Abstract in italiano

I megaprogetti sono delle entità complesse, toccano volontariamente o involontariamente molti aspetti diversi. Purtroppo, i risultati sperati non vengono sempre ottenuti. Complessità e mancanza di risultati lasciano un vuoto nella struttura dei megaprogetti, questo vuoto può e deve essere colmato dallo sviluppo di un metodo di gestione sostenibile.

La sostenibilità è un concetto ampio, che può essere applicato in innumerevoli campi, non si parla solo di ambiente ma anche della sua dimensione sociale. Oggigiorno, impegnarsi per implementare un approccio sostenibile è sempre più fondamentale e necessario. Sostenibilità e megaprogetti non hanno un collegamento diretto, ma sono due entità che si appartengono e la loro integrazione è fondamentale per il progredire dell'integrazione tecnica e sociale dell'essere umano.

Per l'esecuzione dei megaprogetti sono necessarie ingenti quantità di risorse economiche. Ci sono svariati modi di ottenere finanziamenti, uno di questi e il passaggio tramite uno o più IFIs (International Financial Institutions), i quali proprio per la natura imponente dei megaprogetti e spesso internazionale dei megaprogetti si prestano bene per lo svolgimento di questo compito.

Anche nel settore bancario il ruolo della sostenibilità sta crescendo, per accedere a determinati fondi bisogna rientrare in certi criteri e poter dimostrare la volontà e l'impegno per uno sviluppo sostenibile. Regole e linee guida esistono per stabilire i criteri da osservare, anche grazie alla crescente preoccupazione dei governi per il tema.

Nonostante ci sia un sistema in piedi per garantire un'esecuzione sostenibile dei megaprogetti, la realtà dei fatti è ben lontana dalla teoria. Tutte le regolamentazioni possibili immaginabili funzionano sulla carta ma poi è un altro discorso quello di metterle in pratica. Nel caso dei megaprogetti questa disparità si evidenzia ancora di più, data la loro struttura intricata e complessa.

Nasce quindi la necessità di avere delle regole che possano, in maniera semplice, garantire l'implementazione della sostenibilità a tutti i livelli dei megaprogetti. Non si parla più solamente di essere idonei con i criteri di sostenibilità dei finanziatori, ma di trasmettere queste direttive a tutte le parti e a tutti i livelli dei megaprogetti.

Nei megaprogetti di ingegneria civile, soprattutto per la parte di esecuzione dei lavori, l'aggiudicazione avviene attraverso una gara d'appalto. L'implementazione di regolamentazione sostenibile in fase di gara, valorizzando lo sviluppo sostenibile

dell'esecuzione del progetto senza penalizzare i conseguenti costi eccessivi, dà alle imprese private l'opportunità di impiegare le proprie risorse nello studio di soluzioni sostenibili, competitive, e innovative.

Parole chiave: megaprogetti, sostenibilità, IFIs, gara d'appalto, offerta, linee guida.

3 Contents

1 Introduction: research questions and methodology

Sustainability means a development that meets the needs of the present without compromising the ability of future generations to meet their own needs. (1)

The definition comes from the 1987 report published by the World Commission on Environment and Development (WCED) entitled «*Our common future*». (The document is known as the «*Brundtland Report*» after the Commission's chairwoman, Gro Harlem Brundtland.) It calls for a strategy that united development and the environment – described by the now-common term "*sustainable development*".

Finally, after decades of ignoring the environmental and social problems caused by the blistering growth of global industrialisation, we are waking up and we are realizing that we need to change our bad habits, we are at a crossroad, we cannot afford anymore to ignore these problems.

The solution is simple: it must be implemented the concept of sustainability to every little aspect of life, from our private life to our work, no matter the place and most of all no matter the industry.

The aim of this master thesis is to analyse which elements of sustainability can be included into infrastructure megaprojects delivery and, between them, which are most likely to maximise the ranking given by International Financial Institutions (IFIs) to those (mega)projects, to provide funding to them.

Research question:

Q1: Which environmental and social sustainability design criteria, if included into an infrastructure megaproject design, can help maximising the possibility of being funded by International Financial Institutions?

In the first chapter, theoretical features of megaproject and sustainability theory relevant for this thesis are presented forming the first liaison between the two. The megaproject management theory is more and more identifying sustainability as the key factor to overcome the "iron law of megaprojects". (2)It is discussed how implementing a 3P approach (3)to megaprojects can help achieving the value creation and distribution among the wide variety of stakeholders involved in such an endeavour. (4)

Chapter 3 in focused on presenting the IFIs (International Financing Institutions) as a key part of most of megaprojects delivery model and the presentation of the Tender Theory. The Author performed a broad literature review analysing the most important IFIs policies about environmental and social sustainability ranking of infrastructure projects. The aim of IFIs in implementing sustainability into the projects they fund is to achieve the maximum of financial risk reduction thanks to including features such as climate change adaptation and broad stakeholder and local communities' engagement. The chapter also analyse some weak point in the integration of current IFIs' policies for environmental and social sustainability. The Tender Theory has been presented by the Author with an extensive literature review with the goal of integrating this aspects in the conclusion of the work.

The last chapter is focused on grounding the results in the definition of sustainability guidelines that, if included into a megaproject's design, can help maximising the sustainability ranking from the perspective of IFIs and, as a consequence, make it easier to access to funding. Tender theory will be presented, which will give a framework on where the process should be enforced. The conclusion of Chapter 4 is where the guidelines will be presented.

2 Megaprojects and Sustainability 3P

In the following sections the theoretical part of Megaprojects and 3P Sustainability theories relevant for this thesis are presented, in order to provide the framework between the thesis is developed.

2.1. Megaprojects

2.1.1. Premise

Today more than ever, our society requires us to measure ourselves with an ever bigger and faster economy. The natural consequence is that new strategies to keep up with this evolution were born. One of these strategies is represented in the concept of megaprojects. (5)

Megaprojects represent nowadays one of the go-to method for producing results in a variety of fields. The most interesting one, which we will discuss below, is the field of infrastructure and construction. (6)

2.1.2. Definition

The definition of megaprojects has changed a lot during the years, and this is mainly due to their complexity.

Originally, megaprojects have been defined as:

"*Project with a total cost of more than 1 billion dollars*". (1)

Megaprojects are large-scale, complex initiatives that involve significant investments of time, money, and resources. These projects are typically characterized by their ambitious scope, extensive stakeholder involvement, and high level of risk. Megaprojects are often carried out in sectors such as infrastructure, transportation, energy, and construction. (8)

There is no one-size-fits-all definition of megaprojects, as the term can be interpreted in different ways depending on the context. However, a commonly accepted definition

is that megaprojects are projects that have a total budget of at least $1 billion or involve significant political, social, or environmental impact. Megaprojects can also be distinguished from smaller projects by their duration, which can span over several years or even decades. (9)

The concept of megaprojects is often associated with the idea of "grand projects" or "visionary projects" that seek to achieve significant societal or economic benefits. Megaprojects are often seen as essential for addressing critical infrastructure needs, fostering economic development, and improving quality of life for communities. Examples of megaprojects include the construction of large-scale transportation systems, such as high-speed rail networks, the development of mega-dams for hydropower generation, and the construction of mega-cities in emerging economies. (10)

However, megaprojects also face significant challenges, including budget overruns, delays, and stakeholder conflicts. These challenges can arise due to the complexity of the projects, the involvement of multiple stakeholders with different agendas, and the uncertain nature of the projects. In many cases, megaprojects require extensive planning, coordination, and risk management to ensure their success. (11)

In recent years, there has been increasing interest in the study of megaprojects as a distinct field of research. Scholars and practitioners have sought to develop frameworks and best practices for managing megaprojects, as well as to understand the factors that contribute to their success or failure. This research has highlighted the importance of effective governance structures, stakeholder engagement, and risk management in the delivery of megaprojects. (12)

Overall, megaprojects are an essential feature of modern societies and economies, providing critical infrastructure and driving economic development. However, they also pose significant challenges that require careful planning, coordination, and risk management to overcome. As such, understanding the nature and characteristics of megaprojects is essential for anyone involved in the delivery of these projects, whether as a stakeholder, a manager, or a researcher. (2)

2.1.3. Important aspects

One important aspect that megaprojects have in common is the fact that they contain many different subjects, such as:

- Political interest:

Megaprojects, which are large-scale infrastructure initiatives typically involving significant public investment, have long been of interest to political leaders and policymakers. One reason for this is that such projects can help to stimulate economic growth, create jobs, and improve overall social welfare. Additionally, megaprojects often have significant symbolic value, serving as tangible representations of a government's commitment to progress and development. However, megaprojects can also be highly controversial, with concerns about their environmental impact, cost overruns, and potential negative social consequences. As such, political interest in megaprojects requires careful consideration of both the potential benefits and drawbacks, as well as strong stakeholder engagement and transparent decision-making processes. (2)

- Stakeholder:

Stakeholders are individuals, groups or organizations that can affect or be affected by a megaproject. They can include a wide range of parties, such as government agencies, private companies, local communities, environmental groups, and other organizations with a vested interest in the project. Stakeholders can have different objectives and expectations for the megaproject, which can sometimes create conflicts and challenges in terms of project management and decision-making. Involving stakeholders early in the planning process and engaging them throughout the project can help to ensure that their concerns are addressed and that their interests are appropriately considered. Effective stakeholder engagement can also help to build support for the project and reduce the risk of opposition or resistance. As such, stakeholder management is an essential component of successful megaproject development and implementation. (3)

- Local communities:

Local communities are a key stakeholder group in megaprojects. These projects can have significant impacts on the social, economic, and environmental fabric of the communities in which they are located. As such, it is essential to engage with local communities early in the project planning process and involve them throughout the project lifecycle. Effective community engagement can help to build trust and support for the project, as well as identify potential issues and concerns that need to be addressed. However, community engagement in megaprojects can be complex, as local communities often have diverse needs and interests that may be difficult to reconcile with project objectives. Furthermore, communities can sometimes feel excluded from decision-making processes or have limited opportunities to participate in meaningful ways. As such, it is important to adopt inclusive engagement strategies that take into account the unique needs and perspectives of local communities.

Overall, local community engagement is a critical component of successful megaproject development and implementation. (4)

- Deliverability:

The deliverability of megaprojects refers to the ability to successfully complete these large-scale projects on time, within budget, and to the required quality standards. Deliverability is influenced by a range of factors, including project complexity, technological innovations, stakeholder engagement, and governance structures. Effective project management is critical for ensuring deliverability, and this requires a proactive approach to risk management, stakeholder engagement, and performance monitoring. Megaprojects often face significant risks and uncertainties, such as changes in technology or economic conditions, that can impact project deliverability. As such, it is essential to adopt a flexible and adaptive approach to project planning and implementation, and to be prepared to modify project objectives or strategies as needed. Overall, successful deliverability of megaprojects requires a combination of strong project management capabilities, effective stakeholder engagement, and a willingness to adapt to changing circumstances. (5)

- Complexity:

Megaprojects are often characterized by their high levels of complexity, which can arise from a variety of factors, including project size, technical sophistication, and stakeholder diversity. These projects often involve multiple stakeholders with varying interests and priorities, which can lead to complex decision-making processes and governance structures. In addition, megaprojects often require the coordination of multiple disciplines and expertise, such as engineering, finance, and environmental management. Technical challenges, such as the development of new technologies or the management of large-scale infrastructure systems, can also add to the complexity of these projects. Moreover, the sheer size and scale of megaprojects can lead to logistical challenges, such as the coordination of material and human resources over extended periods of time. Overall, the complexity of megaprojects requires a comprehensive and integrated approach to project management that addresses the diverse range of challenges and opportunities presented by these projects. (6)

- Success:

The success of megaprojects can be difficult to define and measure, as these projects often involve multiple objectives, stakeholders, and outcomes. Some common measures of success for megaprojects include the timely completion of the project, the achievement of project goals, and the realization of anticipated benefits, such as

increased economic growth or improved public services. However, success can also be measured in terms of the project's impact on the environment, society, and other stakeholders. For example, a project that is completed on time and within budget may still be considered unsuccessful if it has negative environmental or social consequences. In addition, the success of megaprojects can be influenced by a range of factors, such as the quality of project management, stakeholder engagement, and governance structures. As such, successful megaprojects require a holistic and inclusive approach to planning, implementation, and evaluation. (5)

All these aspects create an entity that establishes connections between various parties, interests and working styles within contractual obligations. (2)

Another important aspect of megaprojects is their strategic importance and the cash flow that keeps them afloat even during an economic crisis. Nonetheless, even if megaprojects have been already widely implemented, we are far from establishing an effective and reliable monitoring system.

2.1.4. Economic threshold

Starting from the definition already given for megaprojects, it is not without controversy. In fact, simply considering the existing inequalities, such as the big disparities between economies of different countries, it is self-evident that, in a more developed country the 1B$ barrier could be pretty accurate and usable and, on the other hand, in a less developed country with less resources even a smaller budget could characterize a megaproject. (3) (4)

The International Project Management Association (IPMA) has suggested that a more practical threshold for nations in the EU area may even be set at 100M€ to address this disparity. The ratio of a project's cost to the gross domestic product (GDP) of the nation itself typically serves as a good indicator of whether it may be deemed an economic megaproject. (1)

This approach ought to make it possible to offer a more inclusive description that can be used to describe the various identified economic sectors. Most of the megaprojects fall within this range. (1)

Since megaprojects touch multiple aspect and fields, characterizing them using uniquely an economic parameter is simplistic and probably incorrect.

Megaprojects are large-scale investments that can have significant economic, social, and environmental impacts. Given the scale of these projects, it is essential to carefully evaluate their economic viability and potential return on investment. The economic threshold is the minimum level of profitability required to justify the investment in a megaproject. In this chapter, we will explore the economic threshold in megaprojects, including the factors that influence this threshold and the challenges associated with achieving it. (2)

The economic threshold of a megaproject is influenced by a range of factors, including the size and scale of the project, the potential revenue streams, and the cost of capital. The size and scale of a megaproject can impact its economic threshold, as larger projects may require more significant investments to achieve profitability. The potential revenue streams of a project can also impact its economic threshold, with projects that generate higher revenues typically having a lower threshold. (11)

The cost of capital is another critical factor in determining the economic threshold of a megaproject. The cost of capital represents the opportunity cost of investing in the project and includes the cost of debt and equity financing. The higher the cost of capital, the higher the economic threshold of the project. (17)

The economic threshold represents the minimum level of profitability required to justify the investment in the project. It is determined by the size and scale of the project, potential revenue streams, and the cost of capital. Achieving the economic threshold is critical to ensure that the project generates sufficient returns on investment to cover the costs of capital and provide a return for investors. The economic aspect of the economic threshold is also influenced by external factors such as market conditions, economic trends, and government policies. Economic feasibility studies are typically conducted to evaluate the financial viability of a megaproject and determine the economic threshold. These studies involve the analysis of the project's costs, revenues, and cash flows over the project's life cycle. By carefully evaluating the economic aspects of the economic threshold, project managers and stakeholders can make informed decisions about the financial viability of the project and increase the likelihood of achieving the project's economic objectives. (2)

The stakeholder aspect of the economic threshold of megaprojects is critical for ensuring the project's social acceptability and overall success. Stakeholders can include a range of actors, such as local communities, businesses, government agencies, and non-governmental organizations. Effective stakeholder engagement is essential for identifying potential risks and opportunities associated with a megaproject and addressing these issues proactively. Stakeholder engagement can also help to ensure that the project aligns with the social, economic, and environmental objectives of the

community and meets the expectations of various stakeholders. In some cases, stakeholders may have competing interests, and effective stakeholder engagement can help to balance these interests and find mutually beneficial solutions. By considering the stakeholder aspect of the economic threshold, project managers can ensure that the project meets the needs of various stakeholders and is socially acceptable, which can increase the likelihood of the project's overall success. (18)

Megaprojects often involve new technologies, processes, and systems that have the potential to transform industries and drive economic growth. By pushing the boundaries of innovation, megaprojects can create new business opportunities, improve efficiency, and increase productivity. However, innovation can also introduce risks and uncertainties, such as cost overruns, schedule delays, and technical difficulties. Effective management of innovation requires a balance between risk and reward. Innovation management should involve early identification of potential risks and uncertainties, regular monitoring of progress, and continuous learning and improvement. By managing the innovation aspect of the economic threshold, project managers can ensure that the project stays at the forefront of technology and remains competitive in the long run.

Megaprojects can be complex, and it can be challenging to identify and define all requirements at the outset of the project. Non-clear requirements can arise from many factors, such as changes in scope, design, and regulations. These requirements can have a significant impact on the project's costs, schedule, and overall feasibility. Effective management of non-clear requirements requires a proactive approach that involves identifying potential risks and uncertainties early in the project and developing a contingency plan to manage them. Effective communication between stakeholders, including project owners, contractors, and suppliers, is also essential to ensure that all parties understand the project's requirements and are aligned with project objectives. By effectively managing non-clear requirements, project managers can minimize the impact of changes on the project's overall economic threshold and increase the likelihood of project success. (9)

2.1.4.1. Local communities

The local communities (as we have seen, one of the different subjects involved in megaprojects) are the first ones to be affected by the execution of a megaproject. This means that their role is crucial since the interaction between public and private parties, can influence the outcome of the whole project.

One of the sectors where the local communities get more involved is the sector of megaprojects in the field of the:

- civil engineering.
- construction.
- public infrastructure.

In fact, it is very important to involve the local communities in the development and execution of this type of projects.

Another aspect that can influence the public opinion is the political implications, i.e. which party commissions the project and which party is executes it. Having, for example, a foreign company executing the construction works, funded by public entities can cause quite a discontent in local communities. (20)

2.1.5. Time, cost and quality in projects and megaprojects

Time, cost, and quality are the primary metrics of the so-called "*Iron Triangle*" or "*Triple Constraint*", which are one of the most popular and immediate approach to evaluate the performance of a project and it describes the relationship between important performance criteria. (5)

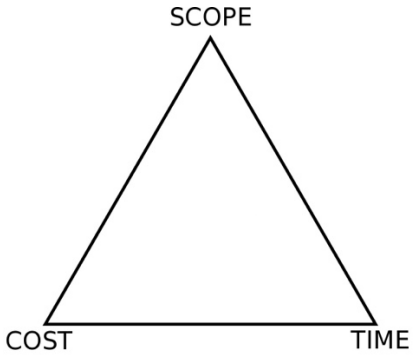

Figure 1: The Iron Triangle (11)

These three quantities have represented for decades the quickest way to evaluate the status of a project, but we reached a point where this is not enough anymore.

Defining the success of megaprojects is a complex issue that involves several interrelated factors. One key challenge is distinguishing between the success of the megaproject itself and the success of managing the megaproject. While these two concepts may be related, they are distinct and require different measures of success.

The success of a megaproject can be defined as its ability to achieve its intended goals and deliver the expected benefits to its stakeholders. These goals may include financial returns, social or environmental benefits, or other outcomes that are important to the project's sponsors and stakeholders. Measuring the success of a megaproject requires careful consideration of these goals and objectives, and a clear understanding of how the project's performance will be evaluated.

On the other hand, the success of managing a megaproject can be defined as the ability to complete the project on time, within budget, and to the required quality standards. This involves managing the project's resources, risks, and stakeholders effectively, and ensuring that the project's performance is monitored and tracked throughout its lifecycle. Measuring the success of managing a megaproject requires consideration of the project's governance structures, project management processes, and the skills and competencies of the project team. (11)

While the success of a megaproject and the success of managing a megaproject are related, they require different measures and perspectives. For example, a megaproject may be considered successful in achieving its intended goals but may have been poorly managed and experienced significant cost overruns or delays. Conversely, a megaproject that is completed on time, within budget, and to the required quality standards may still fail to achieve its intended goals and benefits.

One approach to addressing the problem of defining the success of megaprojects is to develop a comprehensive set of performance metrics that capture both the success of the megaproject itself and the success of managing the megaproject. These metrics may include measures of financial performance, social and environmental impact, and project management performance. In addition, stakeholder engagement and consultation can help to ensure that a wide range of perspectives are considered in evaluating the success of a megaproject. (6)

Nowadays we have the need to include more factors in our analysis, because it happened many times that cost and time are completely incorrect, which is one of the major reasons why project fail.

Additionally, as will be explained in more detail below, the concept of lead time in the context of megaprojects is more complicated due to the long-term consequences and externalities that these projects frequently produce both during construction and after completion.

The usual project life cycle definitions frequently neglect this problem, which has a big impact on how megaprojects define success. A megaproject's life cycle is influenced by a very large number of factors, and it is frequently difficult to determine not just when to consider the project's end but also to pinpoint a specific beginning.

However, the Iron Triangle's popularity is mostly due to its simplicity, which enables a project to be deemed successful whenever it complies with the established criteria. The model is useful in emphasizing the ongoing nature of trade-offs in the process and how every alteration to one variable has an impact on other closely connected criteria. (6)

To avoid an excessive intrinsic simplicity of the topic and portray projects as complex social systems, the research has therefore deepened the individual cost, quality, and time-related elements. Additionally, the inclusion of quality in the triangle has drawn some criticism because it is harder to evaluate objectively than the other two criteria and has a more nuanced definition. (7)

Scope has grown through time to become the third vertex of the triangle that is most valued, while quality, due to its subjectivity and variability, is more seen as a by-product of changes in the other three dimensions rather than as a dimension in and of itself. This altered the Iron Triangle's conventional representation by shifting a quality across its center. (8)

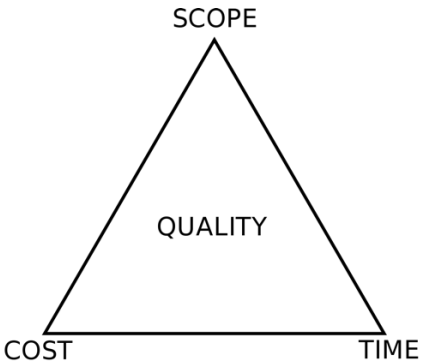

Figure 2: The Iron Triangle in Project Management (14)

The presumption that projects and megaprojects can be understood in terms of quality, money, and time may restrict a comprehensive grasp of its context and conceal viable other solutions that can be adopted with a more flexible mindset.

2.1.6. Stakeholders in public infrastructure megaprojects

So far, from what we have stated, we understood the delicacy of the social context of a megaproject. Other than the social context we have the political context, where the political entities often use megaprojects as a mean to consolidate legacy. This sparks a heated discussion regarding the project's necessity, expenses, and risk of failure on many fronts, involving local and federal government, newspapers, television, and all other forms of media, as well as ultimately the public. (27)

Megaprojects are on paper an opportunity to improve the lives of the local communities, creating job, creating opportunities, creating better services. One of the most important and conspicuous goals in megaproject management is to improve environmental performance in the context of global sustainable development. (9)

The ephemeral nature of projects necessitates a greater amount of effort to build confidence between authorities and stakeholders, and the project managers must carefully evaluate the social and cultural environment, correctly identifying the key and secondary stakeholders that will be impacted. (10)

Instead, the prevailing trend is to place more emphasis on technical details and methods, somewhat ignoring stakeholder management. In fact, a wide range of solutions must stay available to ensure the most flexibility feasible to deal with shifting markets, shifting political environments, shifting technologies, and other potential influencing situations.

The main point is that, for a good development of these type of projects it has been realized that the process must start way up the chain. This means that politicians have the duty to make informed decisions and to take into consideration numerous stakeholders and individuals. Consultation promotes improvements in the quality of public decisions. (6) Opening up decision-making processes to stakeholder participation enables the inclusion of the concerns of all potential recipients of a decision and thus helps administrations to better assess and balance the interests at stake.

Involving stakeholders from outside administrations can also introduce ideas and positions into the decision-making process that would otherwise be overlooked,

helping decision makers to bring up issues that have not yet been considered and to address potential critical issues in the implementation of a policy in advance. Involving stakeholders can also increase trust in institutions and, in the future, foster compliance with decisions by recipients.

In conclusion, government and administration activities must be motivated by the value of citizen participation. As a result, they must view consultation as a crucial step in the decision-making process, investing the necessary commitment, time, organization, and resources in it, and disclosing the outcomes in a transparent manner. (11)

To foster a culture of involvement and make each citizen aware of their potential influence on decision-making, information, communication, and training activities should be carried out. Citizens who are more informed can create knowledgeable communities and contribute in an informed manner. Demands for inclusion from the public must be heard, and while adhering to the processes guiding public decision-making, they must be given the opportunity to do so. Governments must work to make it simple for people to take part in decision-making, particularly by supporting the adoption of innovative and digital solutions. This objective can also be attained by promoting the coordination of active participation initiatives to prevent duplications and overlaps between processes; encouraging consistent and recurring participation in issues of general interest to ensure that contributions are recognized over time. (12)

The result will be a better and higher-quality decision-making process that is more democratic. (13)

Academics have focused on developing a more ethical and transparent approach to projects in order to increase stakeholder engagement and find a better balance between stakeholder effective contributions and awareness of their relevance in stakeholder management. (14)

Since public infrastructure and construction projects typically have a significant impact on people and places, this component is of utmost importance. To better identify and manage benefits and to achieve "*community-inclusive*" megaprojects, it is essential to adopt a tailored approach for each community. (14) (15) Due to resource constraints, it is impossible to take into account the viewpoint of every single prospective stakeholder; therefore, a more comprehensive approach that takes into account secondary players is required. Traditional approaches have made it more difficult for stakeholders to participate and be included, which has decreased their desire to support public megaprojects collectively. Therefore, it should be a top

priority to gain a better grasp of micro stakeholder management in public infrastructure and construction megaprojects. (16)

2.1.7. More inclusive governance framework

For the promoter, it's crucial to keep an eye on time and money in order to establish credibility and get the necessary resources in a situation where the value proposition is still hazy.

Even though it would appear preferable to listen to the thoughts and arguments of the stakeholders for an increasing amount of time, the promoter must take the lead to prevent the discussion from dragging on and becoming unorganized. (17)

Promoters are required to identify what the "*best common value*" is for all pertinent stakeholders. This indicates that attention should be paid to all project team members, not just those who will be involved in it in the near future. (18)

In order to determine the infrastructure's best shared value at all pertinent levels, all parties must collaborate and come up with a workable plan of action. Currently, scholars are putting more emphasis on the necessity of aligning project objectives with those of secondary stakeholders, particularly in the sector of infrastructures, as this subject has not previously received enough in-depth investigation. (19)

A broader emphasis that takes into account both current and future stakeholders ought to result in a megaproject of a higher caliber in terms of its long-term positive effects on society. (16) Involving and engaging stakeholders can also result in the identification of more effective solutions because of their in-depth understanding of the context in which the megaproject is undertaken, as was already noted, and will be further explored later on. However, as it will be addressed, this level of involvement won't just encourage collaboration between stakeholders. Each of them has particular personal interests, and they will all make efforts to shape the results as much as they can in order to achieve these goals. (20) (21)

The more invested these stakeholders are, the more willingly they communicate and work together to find a better solution as a group, motivated by a higher goal. In order to involve them, the promoter can share with them a portion of the authority over the resources because it is difficult to gain the crucial resources that they control. The stakeholders are encouraged to work together rather than compete for resources in such a setting. It is indisputable that when there is a shared decision-making process, compromising is the best course of action.

A compromise may necessitate giving up some of one's personal goals, but it also permits one to escape a potentially fatal impasse that would be detrimental to everyone involved. It should be noted that if the budget is rigid, every unique design choice would lower the value of the finished product for at least one of the relevant stakeholders. In some circumstances, a compromise cannot be reached, and one actor's position will take precedence over that of another. Thus, even while a governance model like this encourages stakeholder collaboration and lessens conflicts, the players will still fight to capture the largest share of the value created. (21) To encourage productive collaboration and prevent issues with collective action, the promoter needs to be seen by the local stakeholders as a neutral party. (17)

Project governance becomes increasingly "*polycentric*" as local institutions for shared decision-making and value creation are added. (17) The megaproject proponent can decide how much control to give the participating stakeholders and whether to decentralize the organizational governance. The aforementioned lead role must be viewed by the performers as impartial and helpful; otherwise, its position may be seen as competitive, which would hinder the process of cooperation. Stakeholders must understand that the promoter's choice to share some of the decision-making responsibilities aims to bring together numerous autonomous actors in pursuit of a higher-order objective. It is possible to eventually gain access to the crucial resources owned by non-market players by inviting them to jointly create value. To gather resources among a group of autonomous organizations who willingly share the form of governance, on the other hand, an alliance must be established. To guide the shared value creation and secure a high degree of commitment from all parties involved, the actors must establish a value proposition. This will help to prevent defections. (17)

2.1.8. Behaviour and value distribution of megaprojects

The promoter must be mindful of time and money in order to maintain credibility over the resources from an outside perspective. Dealing with non-market, secondary stakeholders require a comprehensive yet balanced strategy. To achieve a social surplus, the cost restraints must still be somewhat eased. The social surplus, which is given to the stakeholders in a variety of ways, is the difference between the expected economic value and the overall value produced. The stakeholders are eager to contribute the resources required to complete the project because they are encouraged to get involved in the planning stage so they will receive a share of this social surplus.

The social benefits of a megaproject are solely dependent on the type of future infrastructure. In reality, the infrastructure can be seen of as an intermediary good that,

as a result of a spill over effect, encourages the emergence and growth of several downstream industries. It is much more important to show that a megaproject would benefit society in the case of public infrastructure, such as, of course, by creating jobs or redeveloping a neighbourhood. It is challenging to put a dollar value on the benefits received, especially when comparing expenses and benefits. When viewed from an outside perspective, the project appears less financially sound as the stakeholder requirements grow in quantity and complexity. (17)

The social gains may be difficult to incorporate in such a study because they are nebulous and scarcely quantitative. Sadly, although the expenses rise, it is difficult to fully reap the rewards, especially the non-market ones that go beyond simple economic gains and value rises. Determining the reference period to take into account is extremely challenging because infrastructure megaprojects typically have long-term goals for their results. As was previously mentioned, if the benefits are not appropriately acknowledged, the cost-benefit ratio falls instantly out of balance.

The rules for benefits assessment in the various countries frequently mention safety, travel, operating expenses, trip time savings, and environmental costs when it comes to large-scale transport infrastructures. (22) Many other elements can be taken into account depending on the project's type and the depth of the investigation.

In the case of infrastructure megaprojects, the social benefits must be carefully taken into account during the cost-benefit analysis (CBA). Since it is usual for the traditional CBA to result in a negative result, the analysis must be expanded to take into account all of the advantages that are difficult to quantify. Each of them must be given an arbitrary weight, therefore the decision-viewpoint makers could be crucial for the megaproject's destiny. (41)

2.1.9. Success of projects and megaprojects

Academics have debated for decades how to distinguish between project success and project management success. (23)

Two independent definitions for the two terms must be devised in order to differentiate between projects and project management. A project can be thought of as the accomplishment of a particular objective within the parameters of cost, scope, and time. This entails a number of actions and jobs that use resources, ultimately influencing the final quality of the project through the decisions made.

The process of regulating the accomplishment of the project objectives using tools and procedures, within the framework of an already-existing organizational structure, can be described as project management. The project manager organizes the work, keeps track of its progress, and makes adjustments to handle deviations from the original plan. Although the two definitions may appear to be fairly similar, there is a significant difference in how they are emphasized. (23)

Actually, project management's ultimate purpose is the planning and control of such an activity, even while the project is carried out to benefit the organization in the long run. (24) As a result, project management has a shorter perspective and only lasts till the delivery is made. The project's benefits or effects may persist for decades because of its lengthy life cycle. Contrastingly, only the latter could be used to gauge project and project management success in terms of the Iron Triangle. (23)

The simplest definition of project management success is meeting the output's requirements for time, cost, and quality. (25) Additional factors have grown significantly over the years, such as the client's happiness. (26) Every actor has a unique view on the project's value because value is actually a combination of objective and subjective aspects, such costs, or beliefs. These outcomes are often evaluated once the project is complete (27), emphasizing the above-described short-term perspective.

Project success is more difficult to evaluate in terms of the Iron Triangle because there are so many complex and uncertain aspects to take into account, such as project phase, project type, stakeholder satisfaction, and the accomplishment of strategic goals. Additionally, the project stakeholders can be divided into several systems based on their respective project interests, such as the three functional systems, namely the economic, political, and cultural systems. (28) When discussing project development, each group has a distinct purpose, and they all naturally have some impact over the other groups.

Thus, the financial success of the project will be what determines the satisfaction of the stakeholders from the economic system, whereas the stakeholders from the cultural group will be impacted by their way of life, specifically by their working environment or the quality of service that is perceived. Instead, the political group's stakeholders will assess the project from a macroeconomic and social justice viewpoint, taking into account income inequality or equal opportunity. It is therefore challenging to assess a megaproject's success using a framework like the Iron Triangle since the social value it generates is complex and unique for each stakeholder. (48)

One of the major issues when discussing megaprojects is the customary lack of lessons acquired. Every project is unique, frequently site-specific, and initiated in specific

conditions, making it challenging to draw generic and useful best practices. However, some warnings may prove crucial to a project's success.

First of all, the scope is frequently ambiguous or dynamic. It is still crucial to make sure you fully comprehend it and that your expectations are as clear and defined as you can make them. More importantly, this ought to occur as early as feasible, in the project's first stages. (13) This needs to take place, especially when it comes to private sectors, in an environment where top management is on board and supportive, with regular information and feedback exchanges.

The project managers, whose capacity to perceive the relevance and validity of the ideas is of utmost importance, need to be relatively open to accepting changes in the project scope in order to reap the benefits indicated above. A thorough investigation of the issue and an unbiased evaluation of the potential solutions are required. It happens frequently that a solution is initially thought to be superior, which prevents a fair and accurate evaluation of the alternatives. (13)

Finally, it is necessary to establish an effective communication strategy, particularly for public megaprojects. This is because, as has already been mentioned, the peculiar framework in which these projects are carried out is controlled by mechanisms that are outside the purview of traditional project management. For instance, when it comes to early-stage alternatives that were developed and rejected, it is crucial in a democratic setting to inform the populace of the alternatives that were considered as well as the justifications for the decisions that were made. (13)

2.2. Sustainability 3P

2.2.1. Introduction to sustainability

One of the sociology's founders, Max Weber, asserted many years ago that "*the many value spheres of the universe stand in irreconcilable contradiction with each other*". He may have overdone his point by using the word "*irreconcilable*", but he nonetheless highlighted how challenging it is to bring different value systems into harmony. (49)

This is undoubtedly the case when it comes to the complicated concept of "*sustainability*", where conflict exists between sustainability and development, between

environmental requirements and sociocultural needs and desires, and between the needs of the current generation and those of future generations.

The question of sustainability concerns how humans will use the resources created by nature and its dynamics, and if the human race will take good care of the environment on which it depends or damage its ability to provide us with benefits and unleash hazardous natural dynamics. Modern human activity poses a variety of interrelated threats to sustainability, including habitat loss and biodiversity loss, deforestation, ocean degradation, a shortage of fresh water due to population growth, resource depletion, toxic synthetic chemical build-up in the environment, anthropogenic climate change, etc. (50)

Sustainability is the opposite of social collapse. The ultimate resource that will enable wealth to be sustained over the long term, argue opponents, is human reason: "*Within a century or two, all nations and most of humanity will be at or above today's Western living standards*". (49) Apocalyptic and optimistic discourses are both prevalent, yet they are both or neither hidden by the dynamics of the material world. The key question is whether the language is acceptable for the physical dynamics of nature, which created the human species and ecosystems suitable for it, and which continues to do so, including buildings that unintentionally release undesirable forces.

Because the risks are brought on by human activities and practices rather than asteroids, the sustainability or collapse of human societies is a social issue that begs for social science study. Unfortunately, sociology lacks the tools necessary to contribute to this understanding because it has a long history of suspending natural dynamics rather than looking at how social constructions interact with natural ones. This bracketing is odd because recent research (Rosa and Richter 2008; Foster and Holleman 2012) has demonstrated that the sociology's forefathers examined social practices in the context of their biophysical environment. The problem of society's sustainability combines sociology's traditional emphasis on inequality with two fresh perspectives: time and the dynamics of nature. (51)

2.2.1.1. What is sustainability?

The most popular and enduring definition of sustainability combined it with growth: "*Sustainable development is development that meets present needs without compromising the ability of future generations to meet their own needs*". (49) The Commission placed a strong emphasis on the necessity for progress that is bound by the state of technology, organizational structure, and a finite planet. It suggested looking beyond the short-term time series projections that are now common in economics to expected effects for generations in the far future. It changed from a viewpoint that was exclusive to

socioeconomic structures to one that also considers their interactions with natural dynamics.

Sustainability is reliant on both social and natural structures, i.e., the services that natural dynamics offer human society.

Because of nature's ongoing processes, which have over a geological time period produced resources for human use, such as fossil fuels, fresh water, forests, and waste sinks, or continue to give services to humans, like bee pollination, humans have the means to sustain themselves. Humans must sustain some of these services, like replanting a forest after it is chopped, and protect others from risky human activities, like the Montreal Protocol safeguarding the ozone layer. Humans must also change how they build to one that considers their relationship with the dynamics of nature. (52)

As a systemic problem, sustainability might cause one component of the system to improve while another component may deteriorate. For instance, Germany could turn off its nuclear reactors, but this wouldn't reduce the risks associated with nuclear energy since Germany would still be importing more from France. Japan's greenhouse-gas emissions would deteriorate if it increased its use of fossil fuels to make up for a decline in nuclear energy. It is crucial to understand that any apparent risk decrease can actually just be a change in where danger is located.

Policies and language, for example, are important for sustainability only to the extent that they have an impact on material practices and results. For instance, since the absolute levels of emissions from fossil fuels, black and brown carbon, deforestation, and other manipulations of land use all have an impact on the atmosphere, the consequences are crucial. The Canadian government and its industries have led the world in developing policies and making environmental declarations but have lagged behind in putting those policies into practice. As a result, Canada has been dubbed a global leader in both carbon emissions and "*hot air*" emissions. (49)

It's crucial to ask, "*Sustainability of what?"* when analysing the sustainability issue to make the analysis more focused. Like fascism, some societal norms are not worth upholding. Would we wish to maintain the society based on horses and buggies? Amish society and its patriarchy would. Would we prefer democracy to the monarchy as the preferred form of government? maybe apartheid?

Must the weapons race continue? Sustainability is a concept rich with values. Change is a necessary part of development, and it involves abandoning bad habits when better ones can be found.

Most communities undoubtedly have a strong belief that life has improved because the societies of 500 years ago, with their authoritarian power structures, pervasive poverty, and susceptibility to sickness and natural disasters, could not be sustained. (49)

Pre-democratic, pre-scientific societies were transformed rather than preserved, and this has improved life. The significant increase in life expectancy is a general indicator. Are wealthy societies' and wealthy people's high rates of material consumption to be maintained, and are all other civilizations to be brought up to that level of consumption? That would be very difficult over the long term for a human population of seven billion people expanding to at least nine billion people, and perhaps impossible due to its impact on the natural dynamics that support humans on a finite planet. The advancements have created risk. The interaction of social constructions and natural constructions throughout both short- and long-term time frames is what is meant by the complex idea of sustainability, which is made up of values and material conditions. (49)

It's crucial to avoid sinking into pessimism and hopelessness. Some issues brought on by the interaction of societal and natural constructs have been solved with considerable success. International agreements between nations, such as the Montreal Protocol, have greatly contributed to the solution of the ozone layer depletion caused by CFCs (Chlorofluorocarbons) and by aerosols created and used by market-driven modern technology, which threatened to increase rates of skin cancer in humans and animals and have negative effects on agriculture. The risky technologies created by wealthier countries had to be phased out first to make way for new ones, while developing countries would be given a grace period and the new technology transferred to them. This Protocol had a substantial environmental justice component. State restrictions also gradually phased out leaded gasoline. By setting a limit within which market-based trade of pollution occurred, the government was able to reduce sulphur dioxide emissions and the resultant acid rain. State restrictions helped to reduce air and water pollution in urban areas. Insulation was made without asbestos. The risky technologies created by wealthier countries had to be phased out first to make way for new ones, while developing countries would be given a grace period and the new technology transferred to them. This Protocol had a substantial environmental justice component. State restrictions also gradually phased out leaded gasoline. By setting a limit within which market-based trade of pollution occurred, the government was able to reduce sulphur dioxide emissions and the resultant acid rain. State restrictions helped to reduce air and water pollution in urban areas. Insulation was made without asbestos. The world's leaders in the development of renewable energy, the implementation of carbon taxes, the promotion of legally enforceable international agreements to reduce carbon emissions, and the reduction of emissions

since 1990 are Germany and the social democratic nations of Scandinavia. Norway is the only nation that produces oil and sends a sizable amount of money to underdeveloped nations to offset its carbon emissions. These are all things that may be considered sustainable development successes. In these instances, the threat posed by the environmental issue was acknowledged as a serious one by scientists, the general public, and political authorities; as a result, market rules were put in place. (49)

These changes to potentially hazardous behaviours can also be seen as the accomplishments of top-down campaigns, but it is important to note that they also include a significant bottom-up component, although one that takes varied shapes depending on the situation at hand. For instance, the state in Northern Europe was able to reduce emissions solely as a result of the strong public backing. It is more important to examine the interplay between the top and the bottom that supports either sustainable behaviours or unsustainable ones rather than simply categorizing some programs as "*top-down*" and others as "*bottom-up*". (49)

2.2.2. Sustainability in Triple Bottom Line and 3P sustainability

At this point, the concept of the "*Triple Bottom Line*" should be introduced before considering the Global Reporting Initiative (GRI) standard and related sustainability report. The "bottom line" is a growing metaphor within the corporate lexicon that confers the ability to capture in a single representation (a number) the effect of a multitude of actions (transactions) through the systematic representation of these actions using common metrics and summing contributions (benefits) and detriments (costs). (53) The term triple bottom line has often been attributed to John Elkington, a co-founder and director of sustainability, a sustainable business consulting firm. In practical terms (Figure 3), triple bottom line accounting means expanding the traditional framework to take into account ecological and social performance in addition to economic and financial performance, this within a unified and systemic framework. (3)

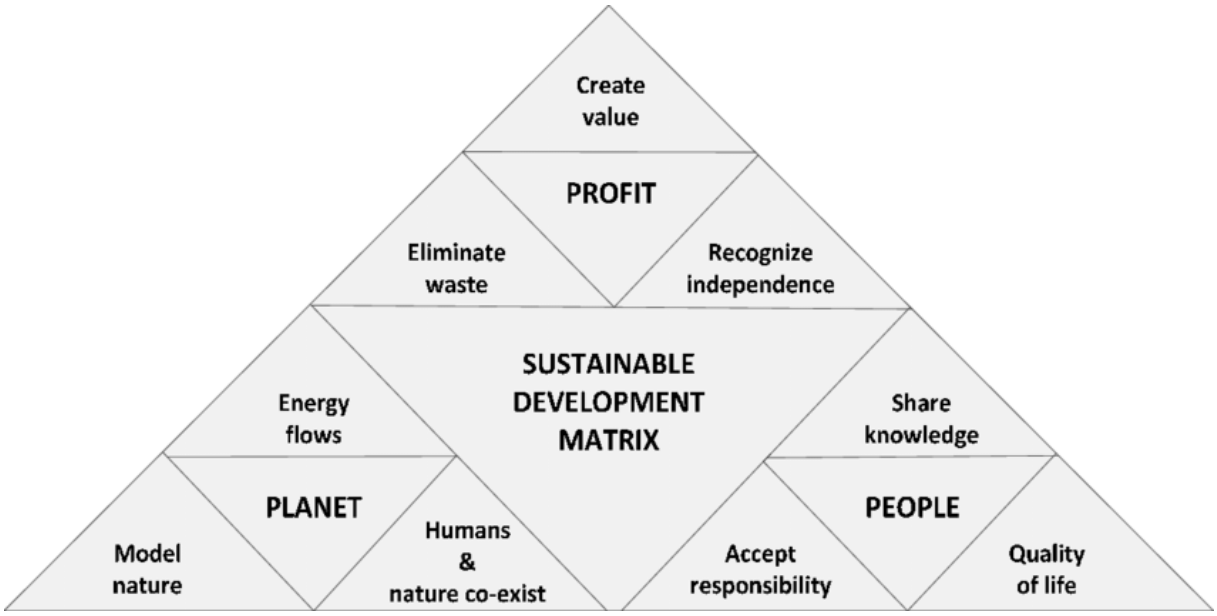

Figure 3: 3P's Model (37)

As soon as it evolved, this method of reporting was used by many organizations for a significant variety of purposes. Some argue that the primary application of the model is nothing more than a way to enhance an organization's public image. (55) Others argue that it is a method for the organization to show its commitment to legitimizing responsible environmental and social activities. (56)

The reporting format is such that it offers a "*dashboard*" of measures to attempt to monetize all three perspectives. (57)

Many consulting firms, organizations, and researchers are working to develop metrics that can, in some way, capture the relevant values of the components of the triple bottom line in a way that allows report users to understand the full and varied value of the organization. (58)

For example, Howes presented a report of "*ecologically sustainable net income*". (59)While the final determination of what the triple bottom line may look like has not yet been finalized, advocates believe that since an organization's long-term viability depends on sustaining "*profitability*" on all three dimensions, they should be measured, evaluated, and presented on a periodic basis, in a manner conceptually similar to current financial reporting models.

In addition, stakeholder groups such as socially responsible investors, nongovernmental organizations, "*green*" consumers, and regulators and government

agencies are steadily increasing their demand for information related to social and environmental dimensions.

Responding to the increase for financial and non-financial information related to a wide range of corporate responsibilities, all major audit firms, offer dedicated services to assist companies in developing Team Based Learninng (TBL)-based reporting tools. So, we will consider how TBL report measures have been developed and how they relate to sustainability. (53)

The "*triple bottom line*" is a reporting technique that applies the "*bottom line*" metaphor to the social and environmental aspects of the business organization. (53)

The legitimacy of this application depends on the extent to which the characteristics of the application domain (social/environmental) conform to those of the source domain (economic/accounting). It is possible to provide a representation as follows. Figure 4 illustrates the resource and information flows associated with a business organization.

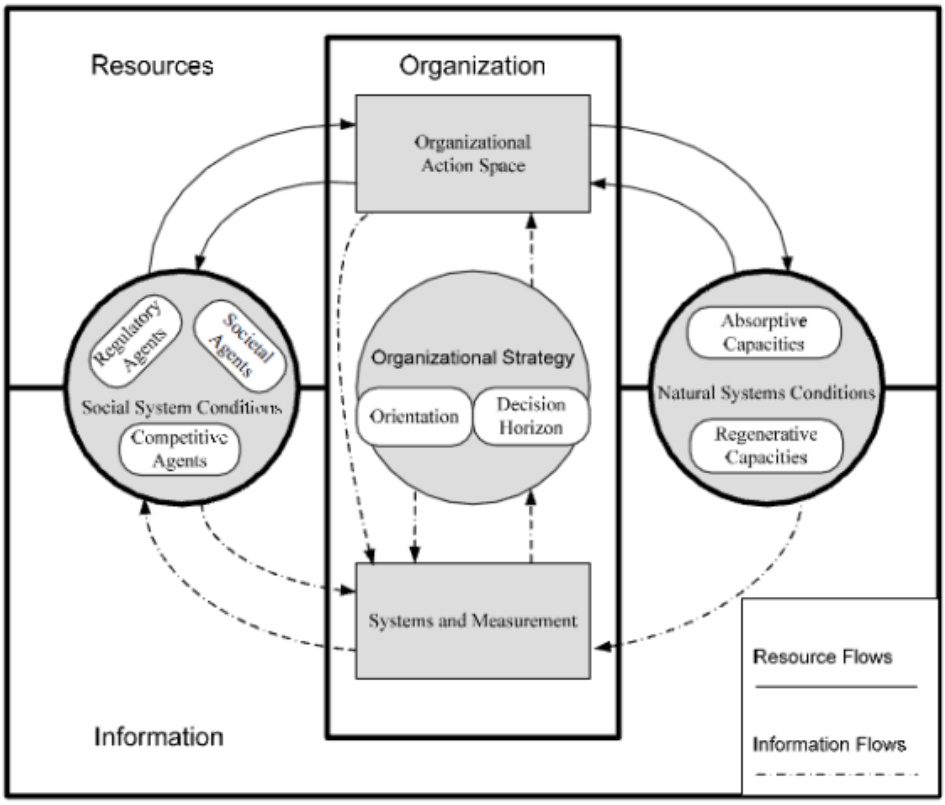

Figure 4: Resource and information flows in a business organization (42)

The organization occupies the centre of the diagram. The circle on the left represents the social system, and the circle on the right the natural system. The upper part of the figure shows the current flows of resources into and out of the organization. Both

systems, social and natural, offer resources/inputs to the organization and are also influenced by its outputs.

These inputs that come from the natural and social worlds form "*the organization's action space*", the organization's behaviours and activities. Consequently, business behaviours and activities affect the social and natural environment.

The lower part of the figure shows information flows. The information system and measurements identify, filter, and measure inputs from organizational actions, the natural system, and the social system. These inputs are then used to create triple bottom line reports, among other communications. Accounting systems form the organizational strategies that ultimately motivate changes in the organization's action space. Thus, finally, the process that produces organizational reports is based on information systems that collect information defined for and controlled by the organization that has an economic point of view in collecting and analysing information related to natural and social systems.

One model that applies the logic of TBL is that of the Global Reporting Initiative. The framework that goes by the name GRI is an international model, promoted in 1997 by the Coalition for Environmentally Responsible Economies (CERES) in collaboration with the United Nations Environment Program (UNEP). Several accounting firms as well as organizations and companies within a complex network contributed to the implementation of this reporting tool. (61)

It is a model that tends to obtain the consensus of stakeholders, companies, investors, trade unions, nongovernmental organizations, universities etc., which is expressed in guidelines that have been improved from time to time since the inception of the initiative. Currently, reference is made to a "third level" of guiding principles, which were presented in 2006. (60)

The purpose is to provide representation, from a "triple bottom line" perspective, within the "*sustainability reports*" prepared by companies that voluntarily choose to apply this model, and at the same time to encourage convergence by companies around the world towards the adoption of the "*sustainability report*" (considering that there is a considerable variety of documents using different terminologies). To this end, there are "*protocols of indicators*", which provide particularly stringent measures of the consequences of business activities in the economic, environmental, and social spheres; these are then supplemented by indicators called "*sector supplements*" that broaden the spectrum of indications modelled on a specific industry sector (given that each company has certain diversified consequences). (60)

A reporting document that is guided by these principles will comply with certain requirements regardless of whether it is presented in hard copy or virtually (within the company's website) and whether it is configured as a "*part*" of a larger report or in a separate manner.

First, the "*level of application*" is chosen, which is indicated by the letters A, B and C. Each corresponds to a certain "*intensity*" of application of the model in the company's financial statements: letter C will testify to the application of the "*minimum*" required content, A will represent a total adoption of the guidelines. It will be seen in detail in the next chapter regarding the construction of the database variables the content of the individual levels of application. Next to these letters may then be "+" symbols indicating that a "*review*" process is taking place on that specific content. The company may also request that its financial statements be reviewed by GRI itself. (60)

In order to ensure a balanced representation of enterprise performance, the financial statements must be prepared in accordance with certain principles for establishing the topics and indicators that the organization should include in the report, as well as principles for ensuring the quality and appropriate presentation of the information contained. The first are as follows:

- ***Materiality***: it is necessary that the topics chosen significantly impact economic, social and environmental performance or stakeholder decisions and evaluations (only "*relevant*" information will be considered); in addition to the topics, the indices must also comply with this principle, with varying degrees of completeness and detail. (60)

- ***Stakeholder Inclusiveness***: this is simply a matter of stating who the relevant stakeholders are in order to explain how the company has worked to meet the expectations of those stakeholders. (60)

- ***Context of sustainability***: the organization's performance should be presented from the perspective of sustainability, *i.e.*, contextualizing the results in relation to and within the limits of the socio-environmental resources and to the company's strategy (*e.g.*, not accounting for how much pollution is being caused, but doing so in relation to the environment's ability to "*absorb*" these impacts). (60)

- ***Completeness***: the definition of the topics and the "*quantification*", albeit qualitative, of the indicators must be such that they reflect "in toto" the specific performance that is being enunciated; "complete" must be the "*reporting boundary*", "*target*", and "*timeline*". (60)

Turning now to consideration of the principles on the quality and adequacy of information, this concern:

- ***Balance***: both positive and negative aspects of performance should be represented. (60)

- ***Comparability***: topics and information should be consistent with each other and allow for comparison both over time (to the same organization) and in space (*i.e.*, to performance of other organizational entities). (60)

- ***Accuracy***: the level of detail of information must be such that it satisfies the information needs of those who read the report. (60)

- ***Timeliness***: inherent in the regularity of sustainable reporting, and its ability to "*help*" stakeholders make their own decisions "*on time*"; reference is made in the document to the "*periods*" to which certain measures turn out to be related. (60)

- ***Clarity***: topics and indicators must be "*readable*" by those to whom the reporting is directed. (60)

- ***Reliability***: the term refers to the reliability of topics and information in the sense that reporting mechanisms, metrics and actions carried out must be analysed evaluated and presented in such a way that stakeholders can make a "*judgment*" on the goodness of the reporting. (60)

Also of primary importance within the report is the identification of the "*scope*" of reporting in the sense that the "*entities*" that are being assessed must be indicated. In particular, the sustainability report must include in its perimeter all entities that generate significant impacts (actual and potential) on sustainability and/or all entities over which the organization exercises control or significant influence on financial and management policies. (60)

So, considering compliance with the aspects just highlighted, a "*Standard Disclosure*" pertaining to the content of the financial statements is indicated in the report. These covers "*strategy and profile*" the "*management mode*" and "*performance indicators*" and is divided into the following points:

1. Strategy and Analysis: Contains the strategic description of the organization's relationship with sustainability, consists of statement by a senior executive/managing director (on sustainability, commitments, major events,

mid- to long-term goals); description of impacts, risks, opportunities (and related governance mechanisms). (60)

2. Organization profile: covers all information that is related to the company (size, markets served, products/services offered, etc.). (60)

3. Report parameters: profile (timing information), objective and scope, external assurance. (60)

4. Governance, commitments, and stakeholder engagement. (60)

5. Management mode and indicators of economic, environmental, and social performance. (60)

A company that decides to use the GRI framework will not be able to forget to include the content just described in the sustainability report. It will, in any case, have the freedom (since the framework we consider is voluntary) to expand the report with the additional content it deems appropriate to communicate.

The Triple Bottom Line is also known as Sustainability 3P and vice versa. 3P sustainability is simpler and more intuitive to present.

People, Profit and Planet are the 3 Ps of sustainability, these are the three principles of sustainable development. The fundamental idea of the triple bottom line is that a sustainable firm should strike the ideal balance between social responsibility (for the benefit of people), economic profitability (profit), and environmental friendliness (for the benefit of the planet). (61)

The relevance of sustainable development for corporate strategy is quickly moving to the top of the list for most business leaders as a result of the public and institutional investors' increased focus on ESG metrics (Environmental, Social, and Governance). Starting your shift to sustainable development and staying on course while doing so require an understanding of the three Ps of sustainability. (61)

Or, to put it another way, corporate management and operations should take into account social and environmental repercussions in addition to just economic ones.

In order to develop a sustainable business culture both internally and publicly, finding the correct balance between the three sustainability principles should be a key component of long-term corporate strategy. These regulations, if implemented

properly, can have a significant positive impact on brand awareness, product quality, and economic competitiveness.

The Planet is the first P in sustainability. An organization's operations and strategy should ethically take into account how they will affect the environment. (61)

There are various ways to investigate environmental sustainability data; here are a few:

- Instead of using a foreign vendor, choose a local one.

- With the help of green technology, switch to renewable energy and lower your CO2 emissions.

- Modernize your infrastructure and start a digital transformation to increase your company's productivity and profitability while also increasing its efficiency.

- Improve product design and encourage recycling throughout the company to make it simpler to recycle raw materials.

- By implementing more cutting-edge technology and employing more ecologically friendly materials, processes and the design cycle can be improved.

- As many woods and trees that provide oxygen should be planted and preserved.

These are just a few instances of environmental sustainability and possible actions that businesses could take to be more earth aware. (61)

The wonderful thing is that each of those actions will not only lessen the company's environmental impact, but they frequently also result in higher-quality products and greater revenue.

To take advantage of this opportunity in creating a win-win situation, otherwise the risk is for a company to start a declining path.

The profit is symbolized by the second P. A company must be profitable in order to be long-lasting; otherwise, it would not exist. (61)

Adding economic value is another oblique sign that a business is providing a valued service to society. The basis of a free market is that you won't make much money from your product if it isn't useful or there are already too many of it on the market.

For these reasons, attaining sustainable development and maintaining the success and long-term viability of the firm depends on profitability and economic sustainability.

The third P stands for people, cultural sustainability, and social responsibility. This holds true for both individuals inside and outside of the enterprise, as well as for society in general. (61)

A sustainable firm should ensure the fair treatment of everyone involved in the supply chain in addition to ensuring the rights, development, well-being, and general working conditions supplied to their own employees.

Additionally, the socially conscious company should, if possible, make an effort to enhance the general social climate in the region in which they do business. This could evolve doing things like making gifts to charities or favouring vendors who act appropriately in the neighbourhood. It is crucial for your business to gain directly or indirectly from the neighbourhood socio-economic community in which it works or interacts. (61)

Business success requires a strong commitment to social sustainability. Gaining the support of the workforce and everyone involved in the company's supply chain will be very beneficial for long-term success and brand recognition. This is especially true when you take into account the rising number of environmentally friendly and conscientious consumers in contemporary culture.

Being a socially conscious company will undoubtedly help achieving long-term success.

A sustainable company should be conscientious of the environment, its customers, and its bottom line. You may rely on the three Ps of sustainability as a framework to prepare for the future. (61)

We can no longer disregard the effects of climate change, biodiversity loss, and eventual depletion of natural resources. Sustainability is going to be a major theme for the current decade given the increased public, governmental, and investment awareness of environmental and social challenges.

The sooner companies can adopt this developing trend, the better it will be for everyone, especially for the competitiveness of enterprise.

The previous business model prioritized short-term shareholder profit at the expense of environmental impact and the adoption of behaviours that can be detrimental to society, such as worker exploitation, child labour, and others. (61)

This short-term thinking contributes to the problems we are currently facing, including inequality and a wide range of environmental problems, including deforestation, ocean plastic pollution, and climate change. It is obvious that our shorter-term thinking is unsustainable.

Instead, sustainable development and the three pillars of sustainability are the core of the new business model that will take over in this decade, enabling us to address the social and environmental issues brought on by the past mistakes we made.

The numerous instances of sustainable development that we can already discover around the world serve as clear evidence of this. Green technology's objectives are outlined using the three Ps of sustainability, paving the road for a sustainable future.

The 3 Ps of sustainability are crucial for the development of companies, as follow some of the main reasons why:

- More and more brands that can show evidence of sustainable business practices will be preferred by consumers. (61)

- Governments will most certainly enact new rules and procedures to take the environmental impact of company operations into account. One of these is the "*carbon market*," for instance, where more ethical companies can exchange carbon credits with less ethical ones. The less eco-friendly businesses are required to buy those credits to make up for their emissions. Businesses that pursue energy efficiency are rewarded economically, while those that do not are penalized. (61)

- When choosing where to deploy capital, banks and investors are increasingly taking ESG (environmental, social, and governance) scores into account. As a result, sustainable organizations will find it simpler to get loans and investments to expand their operations. (61)

Adopting ethical business practices can have significant medium-term and long-term advantages in a number of different areas by taking into account people, the planet, and profit.

Incorporating the 3 Ps of sustainable development into the corporate strategy is the greatest way to achieve these goals because it enables the organization to strike the ideal balance between social, environmental, and economic considerations. Always keep in mind that, in the long run, neglecting people and the environment can result in significant expenditures and harm. On the other side, there are several options that can both help your business and improve the planet. (61)

In conclusion, adopting industry 4.0 and new digital transformation technologies can boost sustainability while also increasing profitability. Being on the cutting edge of technology has never been more crucial. (61)

2.2.3. Megaprojects and sustainability

Megaprojects encounter similar issues and risks around the world as stated in the previous chapter, regardless of the local environment and culture. Megaproject management is widely acknowledged to be a significant difficulty due to the "iron law" of megaprojects, which highlights that they frequently be "*over budget, over time, under benefits, over and over again*" (41) Megaprojects have in reality failed to produce the desired results throughout the past century: even when they adhere to budget and schedule restrictions, a number of factors and behaviours come into play that have a detrimental effect on performance. Additionally, not all of the megaproject's promised benefits for communities and special interest groups are ultimately realized.

In Figure 6 a list of megaprojects with the highest cost overrun. It is impressive the huge amount of money spent additionally in some cases, especially in the first five megaprojects listed.

Project	Cost Overrun (%)
Suez Canal, Egypt	1,900
Scottish Parliament Building, Scotland	1,600
Sydney Opera House, Australia	1,400
Montreal Summer Olympics, Canada	1,300
Concorde Supersonic Aeroplane, UK, France	1,100
Troy and Greenfield Railroad, USA	900
Excalibur Smart Projectile, USA, Sweden	650
Canadian Firearms Registry, Canada	590
Lake Placid Winter Olympics, USA	560
Medicare transaction system, USA	560
Bank of Norway headquarters, Norway	440
Furka Base Tunnel, Switzerland	300
Verrazano Narrow Bridge, USA	280
Boston's Big Dig Artery/Tunnel project, USA	220
Denver International Airport, USA	200
Panama Canal, Panama	200
Minneapolis Hiawatha light rail line, USA	190
Humber Bridge, UK	180
Dublin Port Tunnel, Ireland	160
Montreal Metro Laval extension, Canada	160
Copenhagen Metro, Denmark	150
Boston–New York–Washington Railway, USA	130
Great Belt Rail Tunnel, Denmark	120
London Limehouse Road Tunnel, UK	110
Brooklyn Bridge, USA	100
Shinkansen Joetsu high-speed rail line, Japan	100
Channel Tunnel, UK, France	80
Karlsruhe–Bretten light rail, Germany	80
London Jubilee Line extension, UK	80
Bangkok Metro, Thailand	70
Mexico City Metroline, Mexico	60
High-speed Rail Line South, The Netherlands	60
Great Belt East Bridge, Denmark	50

Figure 5: Cost overrun in the history of megaprojects (6)

In this thesis is sustained the idea that the approach needed to overcome the "*iron law*" is represented by sustainability. In fact, the "3P framework"—People, Profit, and Planet—also known as Sustainability in Triple Bottom Line—is emerging as a critical factor in the assessment, planning, and management of megaproject feasibility.

Megaprojects, which are defined as those having a budget of $1 billion or more, have had a tough time in the previous century producing the intended results as outlined in the planning phase while adhering to financial, quality, and schedule restrictions.

In fact, benefits deficits frequently occur in the face of higher investments and longer scheduling frames, providing yet another clear indicator of underperformance.

Despite the proliferation of new technologies that make software and tools for creating and analysing budgets available, cost non-compliance is a very common issue. Technical aspects, economic factors, and political variables, which are all included in the concept of EEF Enterprise Environmental Factors, are typical causes of the tendency to exceed costs. On the other hand, the so-called "*optimism bias*" phenomenon, which states that project managers underestimate costs because of a "cognitive predisposition" to orient their analysis of the situation upward, can also be blamed. (65)

We can assume two types of faults in megaproject management given the empirical availability of multiple cases that fit the aforementioned hypotheses: The first type of mistake occurs when something is carried out incorrectly, such as poor planning, inaccurate estimating, or a lack of control, which indicates a lack of project management in the application of management rules for the overall conduct of the megaproject. The second type of mistake occurs when something is forgotten or not carried out as well as it could be, but not as a result of a project manager mistake. (42)

One of the most prevalent themes in recent literature holds that considering sustainability in the triple bottom line is necessary to support the traditional performance evaluation approach. The concept of sustainability includes a variety of perspectives, including measuring long-term benefits and resilience, which can be crucial in resolving management issues and assessing the project constraints that arise, particularly when it comes to megaprojects.

Numerous academic studies have examined the relationship between project management and sustainability in recent years (Labuschagne et al., 2005; Craddock, 2013; Goedknegt, 2013; Carvalho et al., 2017; Martnez- Perales et al., 2018). In the past ten years, interest in sustainability in project management has grown significantly, as evidenced by two recent literature studies (Otegi-Olaso et al., 2015; Silvius and Schipper, 2014). What is evident is that changing corporate management strategic procedures is necessary for the majority of firms in order to execute the new sustainability approach in the triple bottom line. (42)

The triple bottom line model is an alternative for large-scale initiatives that must be considered. The three sustainability pillars really make it possible to maintain control over some of the megaproject management's most challenging regions, which frequently correspond to project fields with a strong propensity for abrupt environmental change. The ability to generate profits that last over time and ensure

the durability of the project, the impact it generates on a social level (for example, transportation engineering works: they significantly change the quality and living habits of the affected stakeholders), and the impact that this has at an environmental level, which in the case of large projects is often considerable. The three main pillars represent critical aspects in the management of megaprojects.

But throughout time, more principles have been added to the 3P technique to complement this model, completing, and broadening the perspective of conceptualizing sustainability in the context of project management (and megaprojects).

Since the 3P guidelines are a well-known example of how to apply the sustainability principle to project management, it makes sense to define other complementing pillars to go along with the first three.

The "*iron law triangle*" model is then incorporated into this one, along with additional factors that are meant to keep important components of managing megaprojects, such politics, environmental sensitivity, and potential social impacts, under control.

Currently, neither as a body of knowledge nor as a distinct process, nor are they included as inputs or outputs of any process, the most popular project management frameworks do not incorporate sustainability in the process of administering a project. It is only referenced in a few particular places and solely in reference to the Triple Bottom Line's three core sustainability pillars. As a result, there are currently no established guidelines that project managers can use to introduce sustainable ideas into the operational management of their projects. (42)

The advantages that can be attained through the use of sustainability principles essentially relate to the organizational, social, and economic spheres upon which they are founded. More specifically:

- From a financial perspective, it is possible to mention a decrease in the costs associated with regulatory compliance, as the project would have a longer life cycle as a result of the application of sustainability principles, which would reduce the additional costs associated with complying with new regulations and policies; additionally, a reduction in capital costs and other potential advantages resulting from obtaining resources from requests for proposals in support of sustainability; a reduction in direct costs attributable to the principle of environmental sustainability (reduction in waste of energy and material resources). (42)

- In terms of social benefits, we can firstly focus on those that are directed toward customers and stakeholders, highlighting an increase in their satisfaction, an improvement in the organization's reputation, the introduction of new and more sophisticated methods of communicating with and listening to stakeholders, the possibility of gaining new market shares due to the current significant growth in the market demand for new sustainable products; and finally, the possibility of obtaining new market shares. (42)

- From the perspective of the advantages that can be attained at an organizational and strategic level from the organization by implementing sustainability principles, we can mention greater employee satisfaction, personnel turnover reduction, and attractiveness for qualified professionals; an improvement in overall relations with customers and stakeholders; an increase in the ability to adapt and resilience of the organization. (42)

The goals that can be accomplished via the use of sustainability principles relate to outcomes that are typically long-term and affect not just the management of specific projects but also the entire business.

In order for the project manager to be aware of the strategic objectives underlying the introduction of the sustainability principles for the management of the project under his responsibility, it is essential that the sustainability objectives be defined at a strategic level and included as "*strategic objectives*" in the project charter that initiates the project (specifying the logical connection with the project deliverables). (42)

3 IFIs, Sustainability and Tender Theory

3.1. Definition of IFIs

IFIs, which stand for International Financial Institutions, are financial institution created by more than one country, which means that they are subjected to international laws. Generally, the owners or shareholders of these institutions are national governments, occasionally some international institutions can figure in the ownership. (68)

The major role IFIs play worldwide is, to finance the social and economic development of nations with developing or transitioning economies. Other than fundings, these institutions provide support on the development and implementation of the project. It is easy to understand how IFIs are strictly related with megaprojects.

International Financial Institutions are characterized by AAA credit ratings and a broad participation of countries. (69)These institutions operate independently and share the same scope, which we summarize here with the following points:

- Reduce global poverty and improve people's lifestyle and standards.
- Encourage sustainable economic, social, and institutional development.
- Support regional cooperation and integration.

IFIs lend, credit, and grant to national governments to accomplish these goals. Such funding is typically connected to certain initiatives that emphasize the development of the economy and the social fabric. International financial institutions (IFIs) engage in significant research on topics related to development and provide guidance and technical assistance to the entities they lend to. In addition to providing financial support to national governments for projects and programs, IFIs are also lending directly to non-sovereign guaranteed (NSG) players, such as private businesses and local governments. (68)

IFIs have made significant strides in standardizing their purchasing practices in recent times, with many adopting similar rules and procedures. Nevertheless, there may still be differences in the way each institution implements and interprets these methods. In the following sections, we will analyse the typical features and workings of IFI procurement.

3.1.1. Country Strategies

All IFIs use country strategy documents, as these are fundamental to establishing an IFI's lending priorities for a particular country. Based on the country's own vision for its long-term development and written by the IFI, the document lays out the IFI's support program for the nation.

A country strategy begins by analysing the causes of poverty within the population and identifying key areas where the IFI's assistance can reduce it most effectively. This establishes a foundation for the IFI's future activities in the country, which can range across the entire spectrum of economic and social needs. (69)

The development of the country strategy involves extensive discussions with many stakeholders, including government authorities, representatives of civil society, non-government organizations, development agencies and the private sector. These discussions are crucial to the success of the strategy because they promote collaboration and coordination among the various national partners. (69)

3.1.2. The Project Cycles

Not the IFI supplying the funds, but the borrowing countries, carry out all IFI-funded projects. All borrowers must, however, abide by the IFI's policies and practices during the duration of the project. This is done to ensure that IFI monies are used effectively and transparently.

The project cycle is the framework for the design, planning, implementation, completion, and evaluation of a project and includes comparable stages for all IFIs. The cycle contains business possibilities, so being familiar with it can improve your chances of spotting one and landing a job.

However, you should be aware that project cycles can frequently extend for several years, necessitating a large long-term investment on your part to be involved in a project from beginning to end. However, numerous chances for shorter-term gain can be found in the smaller project cycle components. (69)

The project cycle typically includes the following phases:

- Identification
- Preparation
- Appraisal
- Negotiation
- Implementation and supervision
- Evaluation

3.1.3. The Procurement Process

Make sure you comprehend the obligations of the IFI and the project's executing agency before pursuing a contract for a project sponsored by an IFI. The executing agency is in charge of all project execution and procurement stages, which must adhere to IFI requirements. The IFI and the executing agency do share some of the project preparation work. For all IFIs, these rules and the associated processes are the same. (69)

3.1.4. Project and Procurement Information

The connections, partners, and IFI employees in the donor and borrowing nations are the primary sources of project information. However, frequently, IFI websites also provide access to project-related papers, procurement announcements, and contract awards. Advancement of ongoing initiatives can be tracked and potential opportunities in the borrowing country by reviewing this data in the context of the country strategy document can be evaluated. (69)

3.1.5. Suppliers of Goods, Works, Equipment and Non-Consulting Services

The majority of chances for the purchase of commodities, machinery, construction work, and non-consulting services, like transportation and maintenance, arise during the project's implementation phase.

The majority of IFIs demand that the borrower create a procurement plan, which broadly outlines the goods and services that will be required, when those needs will arise, how much they will likely cost, and the procurement procedures to be employed. The IFI's website constantly updates the procurement plan, which is made available there. (69)

When there are significant financial stakes and/or complex requirements in a procurement, international competitive bidding (ICB) is the method of choice. The goal of ICB is to promptly notify every eligible firm so that they have an equal chance to submit a bid. The UN Development Business Online and at least one local media are where the borrower must publish bid invitations or prequalification invites.

Always become familiar with the procurement policies of the IFI providing the loan before placing a bid. The policies, practices, and techniques of procurement that have been decided upon by the borrower and the IFI are described in these recommendations. (69)

Be mindful, however, that the contract you have with the borrower and the bid documents, not the IFI's procurement policies, govern your relationship with the borrower. (69)

Another important aspect is the prequalification of bidders. Often prequalification of bidders is necessary for specific cases, cases like big and twisted civil contracts, special equipment or technologies, high cost of bidding, low quality goods.

The invitation to bid is extended to all prequalified businesses that satisfy the requirements for eligibility, financial ability, and experience.

According to the evaluation criteria (Bid evaluation), contracts are given to the lowest-evaluated bidder. Note that other aspects like performance, training, maintenance, and operational costs are frequently taken into account, thus the lowest-evaluated bid may not necessarily be the lowest-priced bid. Additionally, bidders from the borrowing nation or manufactured goods with a minimum percentage of domestic content may be given a margin of preference. (69)

3.1.6. Consultants and Consulting Services

IFIs refer to a wide range of both public and private organizations that offer consulting services as "consultants." These include commercial banks, universities, research institutions, governmental organizations, NGOs, consulting firms, engineering firms, management firms, procurement agents, auditors, and individuals. It should be noted that IFIs make a distinction between consulting services and non-consulting services like maintenance, the latter of which are acquired similarly to goods and equipment. (69)

Consultant opportunities are there for the majority of the project cycle. Some examples are given below, along with the locations where they happen:

- Sector studies, master plans, (pre)feasibility studies, project design, and environmental and social impact analyses can all be a part of the preparatory stage. (69)
- The project management, training, and construction oversight phases of implementation can all be included. (69)
- Throughout the project cycle, advisory services may be needed in the areas of strategy, policy, regulation, institutional reform, capacity building, information technology, and technical help. (69)

3.1.7. Corporate and Institutional Procurement

When IFIs buy products or services for their own internal requirements, they also create economic prospects through corporate or institutional procurement. They purchase a wide range of products and services, such as:

- information technology
- communications equipment and services
- office equipment and supplies
- graphic design and publications
- printing services

IFIs also employ a wide range of independent consultants and consulting companies to offer technical skills they do not already have on staff. (69)

When a purchase exceeds a specific threshold, it is made through a competitive process. For their corporate procurement, some IFIs have created electronic notification and procurement systems that allow prospective suppliers to get notices, express their interest, and submit bids electronically. Most IFIs demand that consultants and providers register as vendors. (69)

3.1.8. Private Sector Lending

In recent years, the IFIs have increased their focus on direct financial lending to the private sector in recognition of the crucial role the private sector plays in fostering positive economic development. Other non-sovereign guarantee actors, such as municipal or local governments and other financial institutions, are also recipients of direct loans from some IFIs. (69)

These loans are provided by IFIs through a range of financial instruments, such as direct financing, private equity, and other cutting-edge financing techniques. These possibilities are often located and supported by specific private sector units inside

the relevant IFI, whose major goal is to monitor the financing's impact on development. The World Bank and the Inter-American Development Bank are the exceptions to this rule, as they have separate organizational entities, the International Finance Corporation (IFC) and the Inter-American Investment Corporation (IIC), to support their international lending operations to the private sector. (69)

Different IFIs have varying amounts of lending going to the "public" versus the "private" sectors. Usually, infrastructure projects in the energy, electricity, transport, telecommunications, and water sectors receive the majority of private sector lending at IFIs.

3.1.9. Trust Funds

Trust money help IFIs supplement their available resources. These funds are the result of financial and administrative agreements with outside donors and are used to support high-priority development needs such post-conflict reconstruction, technical assistance, advisory services, and research. Donor nations, foundations, the corporate sector, and occasionally the IFI's own grant resources provide the cash. The monies must be managed and distributed by the IFI. (69)

Many consultants trust funds (CTFs) up until recently were donor-based and tethered, which meant they could only be used to hire consultants who were citizens of the donor country. Today, however, almost all IFIs have eliminated tied trust funds or are in the process of doing so. The majority of brand-new trust funds are untied, sector- or theme-specific, and single- or multi-donor funds.

Their primary goal is to improve global development by funding vital strategic needs with tailored grants. (69)

3.1.10. Business Approaches

Instead of serving as a gateway into a new market, you should view IFI-funded business prospects as one component of a bigger foreign marketing plan. On the other hand, if you have already successfully exported to a certain market, you can anticipate that your strategy will fit the market's potential for IFI projects well. (69)

Each project is given a project officer, who acts as the IFI's managers and supervisors and oversees the project's implementation. They are important contacts for pursuing prospects, and if you can provide them with knowledge or

technologies that can aid in problem-solving and assist to the success of their initiatives, they will be much more interested in your business.

As soon as a project catches your attention, you should look over the project documents to find the main decision-makers and get in touch with them to show your interest in being involved. Consulting and engineering firms must make trips to the country they are borrowing from, and exporters of goods and machinery can benefit greatly as well. (69)

Databases of regional businesses interested in IFI projects are offered by a few of the subscription services that offer procurement notices. Additionally, there are chances to take part in IFI-funded projects via subcontracting with prime contractors who have received project-related contracts. IFI procurement policies do not apply to subcontracts, thus interested businesses should speak with prime contractors directly. (69)

To conclude this first part about IFIs, it seemed appropriate to present briefly the biggest International Financial Institutions. (70)

1. International Monetary Fund (IMF): established in 1944 ant it has 190 countries members.

2. World Economic Forum: established in 1971 as a non-profit foundation.

3. World Bank: established in 1944, it has up to 189 member countries.

4. World Trade Organization (WTO): established in 1995, 164 countries are members.

5. Asian Development Bank (ADB): founded in 1966, 57 countries are members.

6. Asia-Pacific Economic Cooperation (APEC): established in 1989 with 21 countries members.

7. BRICS: established in 2001, the countries members are Russia, China, India, Brazil and South Africa.

3.2. Development of IFIs

In recent decades, international financial institutions (IFIs) have had a significant impact on development theory and practice. IFIs have had an indirect impact on resource transfers by others, such as donors and the private sector, as well as a direct impact through the amount of money they have sent. Aspects of development strategy and ideology have been dominated, which is even more significant. The International Monetary Fund (IMF) and the World Bank are two of the Bretton Woods organizations that are discussed in this part. (71)

It may be argued that no development conversation is complete without mentioning the Washington Consensus and IMF conditionality, the number of people living in poverty as reported by the World Bank, or, more recently, the process used to choose IFI leaders. Although both of the primary Bretton Woods organizations' intellectual contributions have decreased recently, it has long been challenging to divorce national development strategies from the opinions, resources, and influence of the IFIs. (71)

This part examines how governments, donors, and the international community have changed their perspectives on global development as a result of the IMF and World Bank. The first portion is concerned with the years 1970 to 2000, a time of significant resource transfers by IFIs and significant paradigm shifts in development theory. The positions of the Bretton Woods institutions were significantly taken into consideration whether governments were debating economic plans, designing aid programs, negotiating trade agreements, or signing central bank accords. The Fleming-Mundell model, which supported global macroeconomic thinking, and Chenery and Syrquin's proof that growth and distribution need not conflict in development were just two examples of the institutions' unmatched intellectual contributions during their formative years. (71)

The IMF and World Bank's performance during the past ten years, particularly in the wake of the recent global financial crisis, is then examined. We pay particular attention to how changes in the global environment have affected IMF and Bank influence on policy and practice, which, as we will argue, has significantly decreased. We conclude

with a few observations on the possibility of reversing the IMF and World Bank's waning influence.

3.2.1. The role of the IMF

Developing economies (DEs) and the IMF have not always enjoyed equitable relationships. Contrary to industrialized countries in crisis, DEs have experienced currency shortages, have been subject to swings in commodity prices, and are more vulnerable to balance-of-payments crises. As a result, DEs have been driven to follow advice without question. The main advice given by the IMF has always been to maintain a stable balance of payments, low inflation, and balanced fiscal accounts—in other words, to adopt prudent macroeconomic policies. Although (until very recently) the tone of this advice was seldom pleasant, it wasn't always detrimental to development goals. Indeed, it has long been recognized that macroeconomic stability is a necessary but not sufficient prerequisite for economic growth. For instance, one of the five necessary components for high and sustained growth rates is competent macroeconomic management, according to the Spence Commission's Growth Report (Commission on Growth and Development 2008). The IMF's role in economic crises has been extensively discussed in the literature. However, the Fund's impact has been greater when there isn't a crisis because it speaks for economic conservatism and macroeconomic prudence. (71)

The IMF frequently had sympathizers in central banks or finance ministries as the voice of caution, which was frequently expressed through "*Article IV*" talks with governments. They were content to hand up control of fiscal and monetary rigor to the Fund since it was thought to be necessary but challenging to implement due to a refractory government or an adversarial domestic political climate.

As a result, even proud and gifted bureaucracies (like India's) respected the strict IMF recommendations that reduced the burden on government spending. The fund's recommendations have helped even non-members. For instance, the Government of Vietnam's anti-inflationary program in 1989–1990 was created with Fund guidance, but without a single dollar of IMF or Bank resources, as Vietnam wasn't allowed to join the Bretton Woods institutions until 1993. Most developing and emerging market economies now adhere to the advice to adopt sound macroeconomic policies, and it is difficult to overstate the Fund's contribution to this development. (71)

There is little doubt that the IMF has not always given sound advice or managed to strike the ideal balance between macroeconomic stability and economic growth. Some

nations' development may have been impeded by IMF solutions, particularly those that are too small or strategically unimportant to be represented on the IMF Board of Governors or the U.S. Treasury. Sometimes the World Bank, or "*the opposite side of 19th Street*," provided a countervailing case against development goals. Poor management during crises and ideology during non-crisis times were the driving forces behind the IMF's mistakes made in the name of macroeconomic stability. (71)

In retrospect, many, including the IMF's own Independent Evaluation Office, have criticized the IMF's standard approach of adjustment, which starts with crisis management and is frequently supported by desperately needed financing. Since the financial crisis of 1997, the management of the Indonesian banking crisis and the ensuing safeguards put in place have prevented the Fund from playing any significant role in East Asia. Stiglitz accurately criticized the "*IMF approach*" to liquidity issues that was used in the Republic of Korea in late 1997. In hindsight, it is evident that the Fund was just evaluating currency flows and ignoring structural factors, such as the significant leverage of Korean enterprises. It was a catastrophic error on the part of the IMF to boost interest rates during the crisis to the point where they forced many Korean conglomerates (chaebols) into bankruptcy while doing little to stop capital flight. Fortunately, Korea quickly recovered from the crisis and maintained solid macroeconomic fundamentals throughout, including a fiscal surplus prior to the crisis. (71)

Economic growth was always a victim of rigorously implemented austerity plans, which was frequently delayed for several years and was typically driven by abrupt reductions in infrastructure spending. According to Calderon and Serven, budgetary contractions that were most severe on infrastructure caused a decline in Latin America's growth rates. Economic growth rates were invariably treated as exogenous variables even when their endogeneity was clear because, despite the short duration of Fund programs, their effects can have lasting effects. Similar to this, the fiscal contraction being advocated in the current crisis in Greece, an economy without either monetary or exchange rate levers, is incompatible with the resurgence of growth required to stop the decline. (71)

Previous IMF financial models have no regard for social or even growth-related issues. As a result, several DEs adopted rigorous growth strategies. Others chose to disregard the Fund and pursue unconventional, rebellious strategies that frequently resulted in worse economic outcomes, such as high inflation, inflated currencies, and subpar economic management; instances include periods of hyperinflation in Latin America and subpar adjustment strategies in the Philippines and elsewhere. (71)

Other projects failed because structural modifications frequently took at least twice as long as IMF adjustment finance, which lasted only two to three years. The one-size-fits-all strategy taken by the Fund in the 1970s and 1980s has drawn harsh criticism since it frequently resulted in a low-level equilibrium that is linked to slow development and poor economic performance. (71)

The activities of the Fund did produce some beneficial economic results. For instance, in crisis management, the 1995 Uruguay bailout effectively pooled enough resources to cover a broad meaning of M1, saving the banks. Ironically, when Argentina's convertibility plan failed six years later, the banks were hammered once more. Brazil was able to avert significant damage following the "*Tequila Crisis*" in 1994 because to efficient credit lines, and Thailand's bailouts of catastrophic banks failures were likewise well-managed. Strong fundamentals, of course, made IMF interventions less painful: large nations with robust underlying institutions and strong international political support received bailout programs that were more generously crafted and better deals between short-term adjustment and long-term development. (71)

The most detrimental events to prospects for economic growth and development are banking crises. Through the Financial Sector Assessment Program (FSAP), which is jointly overseen by the IMF and the World Bank, IFIs have assisted nations in preventing banking crises. The Financial Sector Assessment Program (FSAP), which was established in the wake of the 1999 economic crises in East Asia and the Russian Federation, is a diagnostic process that examines growth barriers in the financial sector. More than 140 FSAPs were conducted between 1999 and 2009. Most government work was done in confidence, typically at the request of central banks or ministries of finance (IMF 2012). FSAPs were assisting nations in identifying and resolving banking issues even before the present crisis highlighted questions about the effectiveness of banking regulation. In the early 2000s, major economies like Brazil, Mexico, and Indonesia asked for FSAPs, and central bankers privately complimented the process and emphasized its significance. (71)

It is obvious that the IMF's role in development has been challenging. It has destructively implemented poor or harsh adjustment policies while constructively enforcing better macroeconomic management. But for many years, an ideological haze has been engulfing the IMF's operations. The execution of the so-called Washington Consensus fell to the Fund more broadly in the 1980s, and one department of the Fund claimed that its leadership included the "*head priest*" of the Fund, who was noted for his monetary orthodoxy. Many people at the Fund agreed with Nobel laureate Robert Lucas's advice to "*stabilize, liberalize, and privatize*". Similar to trickle-down economics, this ideology promotes the idea that economic honesty and market-based solutions will bring about their own benefits. Even countries with perfect macroeconomic

discipline have adopted additional nonmarket strategies for growth because few economies can afford to invest in this dictum. The U.S. Treasury, which at the time pushed against state engagement in the economy and which exploited crises to promote neo-liberal changes via Fund initiatives, may have had a role in the formation of the Washington Consensus. Some nations were compelled to pick between the programs supported by the Fund and those backed by development banks like the World Bank. Less fortunate nations received heavy doses of harsh adjustment while more fortunate nations played off one IFI against the other. (71)

IFIs have traditionally been governed and influenced by industrialized countries, which has raised certain policy questions. France was able to argue that the CFA zone, an exchange-rate system linked to the French franc, promoted growth in Francophone Africa since it is a developed country, while the U.S. government engaged covertly on the side of political allies. Despite improvements, "*realpolitik*" has arguably still interfered with policymaking. The bailouts of Greece and the Eurozone can be seen as reflecting recent developed-nation bias. (71)

However, the Fund has had the authority and credibility to force exercises and implement adjustment programs to halt the loss of reserves during challenging periods. Although the track record is inconsistent, successful interventions include those in Africa and Korea in the late 1990s as well as Thailand in the 1980s. The Fund also supported the establishment of institutions for central banking. Since 2001, it has co-managed the Public Expenditure and Financial Accountability (PEFA) initiative with the World Bank to help increase financial transparency. We are aware that many dollars disappear from national treasuries, so every dollar PEFA saves is a dollar spent on development. The OECD Tax Center and the IMF have both taken the lead in reforming tax enforcement and collection. Domestic resources for development that far outweigh donor aid are provided by increased tax revenues. (71)

3.2.2. The IMF and the World Bank: cooperation across 19th Street

The Bretton Woods institutions were established with specific objectives in mind. International financial concerns were to be handled by the IMF, while reconstruction leading to new growth and development was to be handled by the World Bank. However, when the Bank started to prioritize development over reconstruction, duties started to converge with those of the IMF. After all, financial factors like exchange rates have an impact on development-related issues like export promotion. Similar to how investment is impacted by the cost of capital, so is poverty. Macroeconomic factors play a significant role in the accomplishment of development objectives. (71)

The Fund did not, however, take poverty or social results into account. To restore budgetary balances, it preferred to impose austerity, and it contacted the Bank for advice on how to reduce spending. Both the IFIs and the DEs found this division of labour to be uncomfortable. Authorities were required to welcome "*missions*" from both organizations. These missions frequently had weak logistical and analytical integration, which was detrimental to the growth of the economy. (71)

After the oil shocks of the 1970s, when it became obvious that substantial modifications were required to reflect quadrupling oil prices, this artificial distinction was abandoned. Short-term BOP (Balance of Payments) issues as well as longer-term development concerns were both impacted by oil shocks. Additionally, the Bank played a significant role in the triangulation process, in which OPEC surpluses were effectively transferred to private financial markets for further loans to oil-importing nations. The World Bank started offering structural adjustment loans in 1980 in order to increase the likelihood that oil-importing DEs could manage and repay debt and to support the necessary structural reforms in the economy (SALs). SALs encroached on IMF territory since they were less expensive, long-term transfers that helped with macroeconomic adjustment. These enormous, recycled flows, initially restricted to 25 percent of Bank lending but occasionally rising to a third, put the Bank in the macroeconomic game. SALs were advantageous to several DEs, who employed them to address fundamental growth and development hindrances including trade liberalization and industrial restructuring. (71)

Compared to finance markets or IMF funding, World Bank SALs have more favourable conditions. Lending agreements also included the distributional and social implications. With a supportive institution, trade-offs were considered between budget reduction and growth goals. SALs placed a new emphasis on energy efficiency, and DEs, who were unfamiliar with the subject, received guidance and additional lending for energy conservation and the development of alternative energy sources, among other things. SALs also included a number of Fund-like requirements, including reducing wasteful spending, reallocating subsidies, and selling surplus state assets to pay for oil imports. The SAL process tended to involve all parties: aid recipients received well-informed guidance; the Bank obtained the Fund's "*imprimatur*" confirming the financial viability of its structural initiatives; and the Fund's short-term BOP management was connected to medium-term adjustment. The Bretton Woods institutions, however, started to appear to the DEs as if they were "*ganging up*" on aid recipients. (71)

Stress was also evident in the World Bank-IMF partnership. Program alignment efforts included the creation of Policy Framework Papers, which aimed to bring inter-temporal coherence between BOP management (including reducing fiscal spending

and trade deficits), long-term adjustments (like the requirement to maintain imports for growth), and spending for priority social purposes. Executive Board members insisted that the IMF confirm the macroeconomic soundness of Bank SALs, with the U.S. government and other OECD chairs leading the charge. The Board fervently recommended that the Bank conduct public expenditure reviews to see where spending reductions should be made in order to restore fiscal balances. (71)

DEs were compelled to outsource many economic choices since they needed the support of both institutions, which was frequently a requirement for access to the capital markets. Cross-conditionality became well-known as coherence and overlap issues proliferated and accusations of ideological bullying were made. When the Bank moved on with a SAL for Argentina without the Fund's approval in 1989, other issues surfaced. The ensuing uproar resulted in a formal agreement, the so-called Concordat, that lasted for almost 20 years, between the World Bank and the IMF. According to the Concordat, the Bank was in charge of development and the Fund had the upper hand in terms of macroeconomics. The relevant Boards discussed these issues, but borrowing countries lacked the influence to make their opinions important. Eventually, a joint committee headed by Pedro Malan, a former finance minister of Brazil, evaluated the Concordat. The Committee recommended that Bank-IMF cooperation be more flexible and natural than what the Concordat specifies. Three of the six members of the Committee representing DEs was a significant move (Brazil, Indonesia, and Nigeria). Changes in governance were beginning. (71)

3.2.3. The World Bank and its influence

Through its lending, co-financing, and analytical work, the World Bank was the international organization that had the greatest impact on determining the development agenda from 1970 to 2000. Bank loans started to make up a sizable portion of the concessional financing accessible to DEs at this time. (71)

Multilateral development banks' loans have rarely been the main source of investment for developing nations. However, MDBs have significantly influenced national governments' and other donors' aspirations for development, in addition to offering protection for private sector lending. Financing has taken many different forms and played a variety of roles. The poorest nations qualify for International Development Association (IDA) credits, which are long-term, heavily discounted loans that resemble grants. Before adjustment lending (also known as programmatic lending), loans were used for projects, frequently for big or strategically significant infrastructure projects that served as the foundation for future economic growth. (71)

Bank financing was typically used for large dams, roads, energy projects, and irrigation systems that required funding and technical know-how. Having a Bank project on their resume frequently made it easier for nations to secure funds from other organizations like USAID, other bilateral donors, or the private sector. Projects funded in this way were subject to international competitive bidding, which increased openness and served as the foundation for domestic organizations that liaised with the multinational project teams and established national procurement procedures. Later on, these organizations evolved into the central hub for national planning and implementation activities in DEs. When one asks the Korean bureaucracy what they valued most from the World Bank, the typical response is the construction of a development-related administrative infrastructure, the formation of a regulatory body, or the establishment of a local development bank. Money was crucial, but developing institutions had a bigger impact. (71)

It's crucial to work with a partner on development. The MDBs (Multilateral Development Banks) assisted the planning ministries in determining priorities by serving as a sounding board or source of validation. Interaction with MDBs was advantageous for Malaysia's Economic Planning Unit, Thailand's National Economic and Social Development Board, and Korea's Economic Planning Board. This included the so-called Economic and Sector Work (Bank Economic Advisory Work), which offered early assistance when the DE personnel was small and there was little access to best practices. These services were especially helpful for rapidly developing economies (like those in East Asia), transitional economies (like those in Eastern Europe, China, or Vietnam), where paradigm shifts were being implemented, and extremely underdeveloped nations where expertise was particularly hard to come by. (71)

For instance, in Indonesia, consultative groups played a crucial and well-recognized role in streamlining flows. Exposure to real-world policy experience was also highly valued, so in the early 1980s, Vietnamese policymakers who met with counterparts from Korea, Indonesia, and Malaysia while under the Bank's auspices influenced the country's stances on FDI, five-year economic development plans, and Russian debt. Additionally, the Bank served as a liaison for numerous less developed DEs in need of international investment. For instance, the Nam Thun II Hydro-electric Project in the Lao Peoples Democratic Republic used the World Bank as recently as 2002 to attest to the management of the environment, society, and expenditures to private sector financiers. In each of these instances, the Bank and other MDBs crammed in private investment flows while incorporating sensible development goals for the inflows. (71)

The integrated advice and expertise in World Bank loans has benefited developing economies of all sizes. This is true even if the actual resource transfers are negligible

or, in some situations, irrelevant. Sector development strategies could be easier to find and comprehend than know-how. With country-specific adjustments, projects established by the Bank can be duplicated in numerous DEs. In the fields of environmental management, rural infrastructure, subway system construction, or social assistance program design, there are several instances when external advice and experience have contributed to the success of development. (71)

It would be incorrect to imply that the intellectual contributions to development debate were more significant than hardware, knowledge, or institutions when considering development strategy. Although there were attempts in the 1990s by non-governmental organizations (NGOs) and others to criticize the Bank for its apparent ideological slant, no other organization possessed the same intellectual sway in the 1970s and 1980s. The Bank's statements, whether on agricultural productivity, family planning, or income distribution, shaped the development debate starting with Robert McNamara's administration. Influential academics also had a significant influence, but testing theories required labs and funding, both of which the MDBs could offer. (71)

Additionally, the Bank started to compile organized data to monitor development and support its claims.

Since 1990, when poverty statistics were first calculated in earnest, the World Bank has been regarded as the most reliable source of development data. Three Governments have used statistics on poverty and income distribution obtained from the Bank to support aid requests, assist in forming domestic policies, and frame discussions about strategy. The "*Progresa*" conditional cash transfer program in Mexico, the comparable "*Bolsa Familiar*" program in Brazil, and other social assistance measures were made possible by data collection that was started under multinational initiatives. (71)

If the World Bank's provided figures on income distribution had no relevance both domestically and internationally, governments would not complain to the organization about them.

No development plan during this time could avoid Syrquin and Chenery's (1989) growth with distribution theory. Without considering the work of Dervis, de Melo, and Robinson, no economic planning model could be created. Without the aid of Price Gittinger's Guide to Project Analysis, no project would be evaluated. (71)

The examination of returns to education, optimal subsidy pricing, and the components of cost-benefit analysis all benefited from significant intellectual contributions. These analytical methods all measured who benefited from spending and showed how price could be used to better the results of development. As best practices, DEs imported

useful manuals and models on managing the power grid, managing traffic, and many other infrastructure-related topics. Many states sent representatives to the World Bank for training or as secondments. Many Bank employees who held high-level positions when they returned home had experience gained from studying actual country situations.

IFIs were criticized for having an ideological bent that preferred market solutions over government involvement, but the evidence frequently refutes this claim. Cross subsidies that benefited the poor were a fundamental analytical tool. Targeting service delivery with expenditure incidence analysis was routine. Ideologies existed that promoted removing the public sector from unimportant economic sectors. But even in some crucial sectors, like the provision of credit, IFIs and governments change their fashion. One illustration of this is national development banks. The most effective DEs have supported small and medium-sized businesses, agricultural development, or national champions through national development banks. The popularity of the Banco de la Nacion in Argentina, the BNDES in Brazil, and several other institutions of a similar nature in East and South Asia has not been altered by IFI attempts to privatize national development. Governments typically disregard suggestions they detest. (71)

IFIs leveraged important new developments in development theory, such North's explanation of the value of institutions, to encourage actual development activities. Outside suggestions were welcomed by the Bank and supported by a thriving research division. Significant publications like the yearly World Development Report were of great significance, especially during the first ten to fifteen years of publication. The World Development Report accepted concepts about major development barriers (whether in the infrastructure or social sectors) and occasionally tackled contentious issues (such as successful vs unsuccessful interventionist government initiatives). It condensed the body of knowledge on development and gave policy-makers direction on what was understood and generally effective. The importance of the Bank's special reports was comparable. They included The East Asia Miracle, a ground-breaking study that examined the contribution of industrial strategies to East Asian prosperity. Privatization was a significant area of Bank research in the 1990s, pioneered by the journal Bureaucrats in Business. (71)

The decision to acknowledge the destructiveness, wastefulness, and immorality of corruption was one of many significant bridges that James Wolfensohn's presidency allowed to be crossed. This decision had a significant impact on development thinking and practice. Examples of the new focus in action include the systematic construction of measures of corruption by Kaufmann, Kraay, and Mastruzzi, the willingness of donors to consider measures of corruption when deciding on assistance, and new

initiatives like the Extractive Industries Transparency Initiative (EITI), the Stolen Asset Recovery initiative (StAR), and Bank-wide anti-corruption programs. (71)

Similar to the work done on income distribution and poverty in the 1970s and 1980s, the Bank has been a leader in the field of governance since 1995. This leadership is clear in nations that have performed anti-corruption surveys, maintained public service scorecards, and established anti-corruption commissions or teams. The Anti-Bribery Convention of the OECD in the middle of the 1990s also contributed to the limited success of transparency and anti-corruption initiatives, but their inclusion as a component of development programs is now universally acknowledged.

The International Finance Corporation (IFC), the private sector arm of the World Bank that has effectively mobilized and leveraged funds for private company investment, is the source of many concepts that guide development efforts. The IFC has been successful by offering demonstration effects including disaster bonds, the expansion of local bond markets, and venture capital funds. Doing Business, a Bank/IFC product that assesses nations according to how easy it is to do business in each, has been much more significant. It serves as a common reference alongside the Global Forum's World Competitiveness Survey, and states are eager to demonstrate improvement in their rankings. (71)

Although IFI leadership in other areas is still present, stronger think tanks in DEs, broader NGOs' (Non-Governmental Organizations) activities, and a variety of international initiatives have eclipsed IFI in terms of development importance. The Sustainable Development Network, the Bank's Gender Action Plan, and the work of the Commission on Growth and Development (Commission on Growth and Development 2008) are notable contributions to the development debate where IFI leadership may have helped to mobilize greater support. However, the advent of the BRIC nations—Brazil, the Russian Federation, India, and China—has increased the range of viewpoints on the ideal balance of state- and market-friendly policies. The hegemony of Washington, D.C., or even the MDBs over development theory and practice has been challenged by China's significant resource-transfer role. Their voice has gotten weaker as the voices of the G20 (and the G5 inside it) have started to get louder. Where do DEs search for their role models is a hot topic right now. (71)

3.3. Sustainability framework

Many financial institutions are changing their operations to be more sustainable in response to mounting pressure from regulators and customers. Markets frequently

believe that financial institutions have a big responsibility to support sustainable development in this regard.

Banks must take sustainability into account while developing new products and strive to minimize any unfavourable effects on society and the environment. For instance, lending money to companies who pollute could cause environmental harm and expose the implicated institutions to financial risks. (72)

We can classify three types of financial dangers: "(a) direct risk (legal liability for pollution produced by borrowers), (b) indirect risk (borrowers may have difficulty in repaying loans due to their increased financial responsibilities for the environmental damage caused), and (c) reputation risks (negative public relations from doing business with environmentally unfriendly firms)" (74) Many banks are now implementing ways to deal with sustainability-related problems, such as requiring loans to meet environmental standards, using environmental management techniques, and promoting financial products that are beneficial to the environment.

The commercial sector must also play a significant role if the SDGs (Sustainable Development Goals) are to be reached. Despite its critical role in this area, the financial sector is lagging in implementing sustainability principles. Since many institutions need to identify and measure the financial risks from climate change thoroughly. The SDGs may offer a priceless chance for business to strengthen its sustainability values. Banks lessen the chance of a negative impact on environmental sustainability, minimize the impact of any harm that may materialize, and promote the ensuing recovery by reallocating credit to more environmentally friendly sectors of the economy and managing credit and market risks. Banks can reduce these risks by joining sustainable banking alliances or implementing "*green*" banking standards like the Equator Principles. Banks are assisted in incorporating environmental and social risks into their evaluations of credit and operational risks inside significant infrastructure investment projects by guidelines like the Equator Principles. (74)

Banks and other financial institutions are placing increasing emphasis on environmental credit risk management, or the integration of environmental risk evaluation into the credit assessment process. Due to the possible significant influence of these elements on the bank's risk profile, it is imperative that financial institutions develop an appropriate framework with which to evaluate and manage the risks associated with Environmental, Social, and (corporate) Governance (ESG) issues. Financially speaking, assessing the effect of ESG risks on a bank's operations aids in the development of a sustainable strategy and the allocation of resources to mitigate any potential hazards. Furthermore, in order to strengthen banks' resilience to these and other risks and consequently preserve financial stability, climate-related risks

must be taken into account when formulating capital requirements. This strategy fits well with the bank's main goal of determining the necessary capital requirements [50]. The institution's risk-adjusted capital ratio (which compares total adjusted capital to the risk-weighted assets held) and CAMELS rating are impacted by the evaluation of sustainability-related issues (a composite value reflecting six areas: capital adequacy, asset quality, management skills, earnings and profitability, liquidity risk, and sensitivity to market risk). (74)

The G20 countries agreed and committed to promoting the G20 Operational Guidelines for Sustainable Financing (hereafter referred to as "*the Guidelines*") in March 2017 in response to the background of growing debt vulnerabilities. By encouraging information-sharing, cooperation, and learning through capacity building among borrowers, creditors, and international financial institutions, these principles seek to " *enhance access to sound financing for development while ensuring that sovereign debt remains on a sustainable path by fostering information- sharing and cooperation among borrowers, creditors and international financial institutions, as well as learning through capacity building*". (75)The G20 members requested the IMF and the World Bank's help with a voluntary diagnostic of creditors in the implementation of the Guidelines in late 2018. The diagnostic was released in late 2018 and received a lot of support, especially from non-G-20 countries.

In order to assist bilateral creditors, including their agencies, to assess their own performance and degree of compliance with the Guidelines, the IMF and the World Bank have produced a set of norms for the five major criteria outlined in the Guidelines. Staff drew on a variety of additional sources of international practices in creating specific activities for putting the practices into practice and separating them into three levels of achievement.

Implementation of each practice is categorized by the diagnostic instrument as "*strong*", "*sound*", or "*with room for improvement*". According to the IMF and the World Bank, "*strong*" lending practices often set high standards and improve sustainable lending practices. A practice that is "*sound*" indicates financing strategies that aid in the execution of the Guidelines, whereas a practice that is "*with room for improvement*" reflects strategies that fall short of the standards necessary for the Guidelines' implementation. (75)

The diagnosis should be used by all pertinent lending institutions in a nation.

The lowest scored agency, unless it is not making significant loans, should generally serve as the overall assessment's guide when many agencies are involved. Such exceptions ought to be included in the answers. Although the responses concentrate

on particular country agencies, in reality, the judgments may be affected by the agencies' participation in international fora like the Paris Club and the OECD. When evaluating the action, evaluation, or method, it should be recognized and taken into consideration when pertinent actions, evaluations, or procedures are carried out in international fora. (75)

In the Appendix section (Appendix A) the Guideline can be found which provides a brief Guidance Note (Annex I) that contains a synopsis of the diagnostic tool and specific instructions for users (Annex II). Both are based on comments and inquiries made by creditors who completed an earlier questionnaire-based study. (75)

After all the consideration made so far, the documents and the authors of the documents used as cross-reference in the drafting of the guidelines in Chapter 4 will be presented:

- "Official Journal of the European Union, Regulations, COMMISSION DELEGATED REGULATION (EU) 2021/2139, of the 4th June 2021, *supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives"*

The official journal of the European Union (EU) is called the "Official Journal of the European Union." It is the main official source of legal information of the EU, containing EU law, case law of the European Court of Justice, and other official documents and announcements. (76)

- "COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT, Commission Delegated Regulation (EU), 4th June 2021, supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives"

The Commission Regulated Regulation (EU) is a type of legislation in the European Union that is adopted by the European Commission under its delegated powers. The Commission Regulated Regulations are a form of secondary legislation that are used to provide more detailed rules and specifications for implementing EU laws and policies. (77)

The Commission Regulated Regulations are adopted by the European Commission, which is responsible for ensuring that EU laws are implemented effectively across the member states. The Commission Regulated Regulations can be adopted for a variety of purposes, such as setting technical standards, establishing procedures for implementing EU policies, or defining the details of a particular EU law. (77)

The Commission Regulated Regulations are binding in their entirety and directly applicable in all EU member states. This means that once a Commission Regulated Regulation is adopted, it becomes part of the legal framework of the EU and is binding on all member states without the need for national transposition.

In summary, the Commission Regulated Regulation is a type of secondary legislation in the European Union that is adopted by the European Commission to provide more detailed rules and specifications for implementing EU laws and policies. (77)

- "GUIDELINES FOR ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT, Cement Sustainability Initiative (CSI)"

The Cement Sustainability Initiative (CSI) is a global effort by cement companies to promote sustainable development in the cement industry. One of the main focus areas of the CSI is the environment, and they have developed a set of guidelines for environmental management in the cement industry. Some of the key guidelines for the environment from the CSI include:

- Reducing greenhouse gas emissions: Cement manufacturing is a significant source of greenhouse gas emissions, particularly carbon dioxide (CO2). The CSI recommends that cement companies develop strategies to reduce their greenhouse gas emissions, including using alternative fuels and improving energy efficiency. (78)
- Managing air pollution: Cement plants can generate air pollution from various sources, including the burning of fuels and the production process itself. The CSI recommends that cement companies implement measures to monitor and control air pollution, such as using dust filters and installing scrubbers. (78)

- Conserving natural resources: Cement production can consume large amounts of natural resources, such as water and raw materials. The CSI recommends that cement companies implement measures to conserve these resources, such as using recycled materials and optimizing water use. (78)
- Managing waste: Cement production generates various types of waste, such as dust, kiln emissions, and packaging materials. The CSI recommends that cement companies implement measures to manage and minimize waste, such as recycling and reusing waste materials. (78)
- Protecting biodiversity: Cement plants can have an impact on local ecosystems and biodiversity. The CSI recommends that cement companies assess the potential impact of their operations on biodiversity and develop measures to mitigate any adverse effects. (78)

These are just a few of the guidelines for environmental management in the cement industry from the CSI. (78)

- "EQUATOR PRONCIPLES", EP4, July 2020

The Equator Principles (EP) is a framework for managing social and environmental risks in project finance. It is a set of voluntary guidelines that financial institutions can adopt to evaluate and manage the environmental and social risks associated with lending to projects, particularly in the extractive industries, infrastructure, and energy sectors. (79)

The EP were first developed in 2003 by a group of 10 banks and have since been revised and updated. Currently, over 100 financial institutions from around the world have adopted the Equator Principles.

The Equator Principles provide a framework for financial institutions to identify, assess, and manage environmental and social risks in their lending practices. They require project sponsors to conduct social and environmental assessments, consult with affected stakeholders, and develop and implement plans to mitigate any adverse impacts of their projects. (79)

The Equator Principles cover a range of environmental and social issues, including climate change, biodiversity, human rights, labor rights, and community health and safety. By adopting the Equator Principles, financial institutions commit to incorporating environmental and social risk management into their lending decisions, and to promoting sustainable development in the projects they finance. (79)

3.4. The Tender Theory

A study by Lawrence Friedman with the title "*A Competitive-Bidding Strategy*" was published in the journal Operations Research in 1956, purportedly in the spirit of game theory. Although the development of a consistent theoretical framework has been slower and very little of the writings has been devoted to testing, verifying, or analysing the theory itself, the real significance of the paper lies in the way it generated interest, research, theorizing, and publications to the extent that we can now identify tendering as one of the best documented and well researched areas of building economics. (80)

The purpose of Friedman's papers from 1956 and 1957 was to maximize the anticipated profit from a single tender in which each contender simultaneously submits one closed bid (tender). The bidder (tenderer) should choose the cost markup that maximizes projected value of profit, which is the product of the cost markup and contract likelihood. (80)

The issue is figuring out the chance of winning as a function of the mark-up, as Friedman noted. His answer was to research the rivals' prior interactions to determine their "*bidding patterns*". This is accomplished more specifically by computing the ratios between the bids submitted by rival companies and the decision-own maker's cost estimate. It is thus possible to predict the odds of winning with various mark-ups against each competitor and, by aggregation, against any possible combination of competitors, provided there have been a sufficient number of prior meetings. (80)

The remainder of the paper is devoted to alternative goals, estimating the probability distribution of the number of competitors, the likely shapes of the competitors' bids' probability density functions, and the strategy when multiple bids are submitted at once and there are limits on the combined value of all bids. It is clear, every premise is expressed explicitly, and it is simple (or set of simultaneous single bids). (80)

Bidding Strategies and Probabilities by Gates was the following significant essay on the subject. In order to create a generic, profit-maximizing price model for tendering, this research reinterpreted Friedman's method for a single bid. Gates does not acknowledge Friedman's study in the creation of his own model, yet the two publications share a lot of similarities. Like Friedman, Gates argued that past experiences could be used to assess the likelihood of winning a bid and that the best course of action was to maximize the expected value of the bid's profit. However, Gates transforms what Friedman considered to be the proper technique for a single bid into

a generic strategy that can be applied to all bids. In essence, Gates has transformed a straightforward decision support model into an economic model for setting building project prices. (80)

Additional discrepancies included a variation in the estimation of the likelihood of defeating multiple opponents. The focus of the literature has been on this specific aspect of the two papers, and several empirical and theoretical tests of the comparative appropriateness of the suggested methods of probability aggregation have been conducted with Weverberg applying the correct analysis in each case. However, to date, the significant ramifications of the shift from Friedman's paper's technique for a single event to Gates' paper's broad theory of price determination of construction projects have been largely disregarded. (80)

3.4.1. Tendering theory as a theory of price determination

It can be helpful to enumerate the fundamental aspects of tendering theory before moving further. Tendering theory is a pricing theory, as stated by Gates and also expressly stated by Friedman. The expected cost of carrying out the project, including the return on capital, plus a strategy for maximizing profit, which, with certain caveats given below, is essentially a continuous markup, make up the optimum bid as a pricing theory. (80)

According to Archibald, the statements about motivation, behavior of economic agents, existence and stability of functional relationships, restrictions on the range of variables to be considered, and boundary conditions under which the theory is assumed to apply can all be categorized as assumptions in economic theories. (80)

Economic theories make several different types of assumptions, including those relating to motivation, behavior, functional relationships, restrictions on the range of variables, and boundary conditions or applicability.

This emphasizes a tendering notion that differs from the conventional method of viewing the tendering process: it moves beyond the winning tender as setting the price of an individual contract into a theory of pricing in an industry where each object is unique. (80)

We must prove that there is a market and a single product available for purchase in that market in order to support the idea of an economic price theory. In this case, the conventional approach to examining the output of the building sector has a conceptual flaw. Each project is distinct if we consider it as a design, a place, a time, and a

collection of building materials. However, we must acknowledge that the builders are not marketing these houses and turn our attention away from the plain distinctions between the various structures. Builders sell the managerial abilities required to coordinate the use of labor, equipment, and materials to construct new structures. (80)

Because the abilities needed for various project kinds vary, we have various markets. The marketplaces for each sort of project, however, are distinct. For instance, the skills required to build several single-family homes are essentially the same, and any market member can make any of the goods exchanged in that market. The same is true for the markets for high-rise office buildings and driveways. The construction sector sells services, and within each market, the services are essentially the same. (80)

Even if the product is traded in bundles of various sizes every time, if we have an identical product for sale and a tendering process that informs the buyer who is willing to sell and for what price, we have a market and a market price, and a theory that determines how that price is derived is a theory of pricing.

3.4.2. Constant mark-up

The second feature of Gates' pricing model is that the markup used to maximize profit is consistent throughout time and in practice from one tender to the next. This is yet another significant distinction between Friedman's idea of a strategy for a single tender and Gates' broad theory of tendering as well as Friedman's model extension. For estimation purposes, Friedman makes the ceteris paribus assumption that "*each rival is likely to bid as he has done in the past*", which may not be an exact depiction of reality but may be close enough to give the user a competitive edge. (80)

Gates, who is less explicit, does not state the assumptions explicitly but instead establishes the probability of success using empirical data gathered over a number of years and a method that explicitly rules out the possibility of systematic mark-up changes as a correspondence rule for calculating the probabilities of success at various mark-ups. Since this is "*the best mark-up to include whenever your competitors are only A, B, and C,"* emphasis added, Gates claims that the optimal mark-up for competing with firms A, B, and C remains constant over time. The probability density functions don't require re-estimation at any point or for any reason. This remark expressly rules out the idea of systematic mark-up modifications. (80)

In order to assign probability to the bids, it must be assumed that the bids occur in a way that can be treated statistically. This suggests that bids are essentially random in

character and are calculated using a probability density function with set parameters. Since a significant number of observations (bid values) are simply not available at any given moment, estimating the value of these parameters empirically for construction contract bidding inherently includes making assumptions about their stability over time. Indeed, it has been suggested that there will never be enough observations, not even across time. (80)

This brings up a crucial matter of theoretical applicability. First, it can be argued that since the practical assumption that bids do not change over time is required by the empirical requirements of parameter estimation, the same assumption is logically implied theoretically. Accepting this argument also entails acknowledging the implicit theoretical foundations of all practical behavior. This is a crucial subject with strong philosophical roots and implications, such as dismissing the idea of atheoretical behavior as nonsensical. However, recent research on the philosophical underpinnings of broad economic theories overwhelmingly supports the argument for accepting the inferred theory. Economic theory cannot exist without implied theory because it is totally based on what is inferred from practice. (80)

Also, according to Gates' implied tendering theory, variations in bids are simply the result of unsystematic or random variations in the competitors' and/or own cost estimates and/or markups, not market conditions or competitors' capacity utilizations in and of themselves. This is because Gates uses statistical models to support this assumption.

The theory cannot hold, since the markups can no longer be viewed as random, if regular variations in bidding behavior do occur in reality, such as in different markets or in reaction to changes in demand. Practice-related repercussions are also present. Another issue that plagues many branches of economic theory is that, ironically, the execution of the theory's prescriptions is enough to disprove the theory from which they have been developed. If Gates' technique is effective in this situation, it is improbable that the presumption that the competitors do not alter their behavior at any point in reaction to its deployment. This is a key distinction between tendering theory and game theory, as is seen below. (80)

In terms of applying the calculated probability density functions, Gates begins with a scenario in which the competitors are known, as well as their probability density functions, but then broadens the analysis to include scenarios in which the competitors are unknown but are assumed to be "*typical bidders*"—an average of the bidders encountered in the past. For the typical instance with n typical competitors, the optimal markup would remain constant under these circumstances. Only variations in the number of competitors or the presence of certain competitors would cause the

probability density function to vary. The probability distribution for each tender process would be unique if, on the other hand, any of these conditions were to be broken; as a result, the ideal markup would also be distinct for each tender process. (80)

Each tender's price is determined by the cost estimate plus a certain percentage markup. The bidder won't win every time for obvious reasons. There are no guarantees because the bidder is only aiming for a specified percentage of the contracts, and this depends on how accurately (or inaccurately) the bidder and its competitors estimate their as-yet-unknown future expenses. The winning bid will be quite similar to the own bid, though, if the probability density function parameters can be determined with accuracy and the cost estimates are evenly distributed. The winning bidder determines the price for each contract, which is based on the cost plus a markup from a predetermined probability density function. Although there may be some variation in the offers between different bidders due to the difficulty of predicting in advance the scope of the services needed, the chances of winning at any price will always be the same within certain bounds. This will be the case throughout the market, and variations in the pricing provided by various bids and projects will just represent random variations. It follows that if everyone behaves rationally and follows the tendering theory, each bidder will apply a markup that is appropriate for the number of bidders competing, and any disparities between bids will be the result of variations in the original cost estimate. (80)

According to Gates' method, the tendering hypothesis presupposes stable markups that are unaffected by changes in demand. Costs plus a fixed markup are used to determine the price, and potential rival actions and counterstrategies are disregarded. If there are any variations between competitors, they are due to the need to estimate costs prior to contract execution and any anomalies brought on by the procedure of submitting a single, final bid as opposed to the more traditional practice of pricing the product once the cost is known. (80)

3.4.3. Differences between game theory and tendering theory

Before going any further, it is appropriate to discuss the veracity of the assertion that tendering theory is founded on game theory, which is implied by the use of probabilistic maximization techniques, the allusions to game theory and the theoretical work of von Neumann and Morgenstern.

The study of problems involving the interactions of rational beings is known as game theory. This necessitates making the assumption that the competitors will employ the most lucrative counter strategy and the choice of the "*best*" defense measures in a zero-sum game where the winner takes all, such as tendering. Shubik asserts that game theory is applicable in situations where *"the outcome of the behaviour of firms and individuals does not depend on their own actions alone nor those combined by chance, but also on the actions of others who sometimes oppose, sometimes fortify, those of the former"*. (80)

The fundamental tenet of game theory is that the outcome depends on both the player's and the other player's strategy choices. Game theory must have this "*Conscious Conflict*" in order to work and any predictions that contradict a presumpted, if ill-defined, rationality are disregarded. According to game theory, each player must think through their own strategies and choose the one that will be most effective given that every other player will follow suit. It does not apply when only one player is permitted to use their chosen strategy without the other players making any attempts to adjust their own. (80)

For the kind of intricate issues that tendering theory represents, game theory likewise has issues. Each firm depends on a hypothesis of the actions of other firms, but there is no reason to think that these actions should be consistent, according to Arrow, who is presenting the fundamental idea of game theory. Schmalensee and Friedman both make the comparable argument that the rationality assumption is pushed extremely far if boundedly rational people can address the extremely complex problems that arise in daily life. (80)

In addition to these issues, game-theoretical model predictions frequently appear fragile. Important qualitative characteristics of equilibria frequently depend critically on a number of assumptions, including whether prices or quantities are choice variables, whether discrete or continuous time is assumed, whether moves are sequential or simultaneous, and – perhaps most unsettling of all – how players with incomplete information are assumed to change their beliefs in response to events that cannot occur in equilibrium. Arguments that learning occurs when playing games do little to help. Simply creating progressively more sophisticated games as behavior changes is all that is necessary to allow for logical learning. (80)

It can also be shown that there is no pure strategy equilibrium if mark-up is thought of as a continuous variable and therefore infinitely divisible, representing an infinite number of possible strategies while the pay-off is discontinuous as in either winning or losing, as we have with tendering theory. This means that, despite the terminology in Gates' original study implying otherwise, tendering theory cannot be categorized as

a game theoretical approach to pricing. Instead, it cannot logically represent an optimal game strategy. (80)

3.4.4. Tendering theory as decision theory

Tendering theory was alluded to as a method of bidding by Gates. As a result, rather than being viewed as descriptive or positive, tendering theory is frequently just understood as a normative or prescriptive theory. This argument claims that tendering theory is nothing more than a model of rational behavior and that rationality is a normative idea. If that were the case, tendering theory would be normative, similar to nearly all other social science theories, and useless for elucidating actual behavior. (80)

The "*ought to*" in a normative theory, however, also involves "*being able to*". Tendering theory provides an account of attainable rationality in addition to how tendering "*ought*" to be done. Whether it is desired or assumed as an axiom, rationality is about results, which, if attained, will have consequences that, at least in theory, can be observed, examined, and either validated or refuted. Therefore, it is false to claim that theories like the tendering theory, which mandate rationality and may therefore be expressed as decision rules, cannot also be positive or descriptive. Such a claim needs to be supported by empirical data. (80)

This viewpoint is opposed by the fact that it is generally acknowledged that there are consequences for acting contrary to reason. According to Alchian, only logical behavior has a chance of surviving in business. Or, to put it more simply: irrational behavior cannot be tolerated. (80)

One significant distinction between tendering theory and the theory of decision analysis, or decision theory, is that while decision theory provides the analytical tools to maximize any individual utility function regardless of what this utility function is, tendering theory stipulates a universal maximization objective. The Gates model is a strong proponent of the positive theory of price determination in this view as well.

3.4.5. Theory of auctions.

There has been relatively little study done on the actual outcome, the pricing, because the process of gaining new contracts through tendering with concurrent single sealed bid tenders for unique projects includes so many variables. Auction theories may be helpful in this situation.

There are numerous models of auction theory available to handle a wide range of circumstances. The quantity of bidders and/or sellers, the information available, the type of auction, the type of bidding, single or sequential auctions, finite or infinite sequences, equal or individual-private valuations of the item auctioned, cooperative or non-cooperative bidding, with or without a reserve price, and with or without a commitment to accept the outcome of the auction The quantity of papers, articles, and books devoted to various aspects of auctions is a reflection of the empirical relevance of tenders. For many different kinds of goods, tendering is a popular technique of procurement, and the value of items sold through auctions or tenders is enormous. (80)

The type of auction that applies to tendering is the non-cooperative, simultaneous, single sealed bid type with individual-private valuations, extensive public information if not perfect public information, a large number of bidders for an infinite or extended sequence of auctions. A single bid auction is significant because it is thought to represent both the private evaluation of the contract and the winning. The distortion that could result from putting a strategy in the bid is, however, minimal. According to the so-called Revenue-Equivalence Theorem, a single sealed bid auction typically results in the same price as sealed bid auctions for English, Dutch, and second prices. (80)

One further piece of information is needed in order to apply this to building sector tendering: what transpires during repeated auctions. One area where experimental results are available is auctions. As a result, we have replication without breaking any ceteris paribus rules and legitimate chances to verify the theorems. Regarding the evaluation of such experimental findings, Roth says: "*One of the striking and by now well known results from the literature is that ... it is possible to observe traders converge to competitive equilibrium, in repeated markets . . . often in relatively few periods, as traders gain experience, through repetition, with the parameters of the market".* (80)

In a similar vein, McAfee and McMillan state that auctions help to aggregate dispersed knowledge and that "*Provided there are numerous bidders, and provided information is adequately spread among the bidders, the price equals the item's true value."* The formation of a competitive equilibrium price is not inhibited by the tendering process as a whole, hence the phrase "*real value*" in this case must relate to the value the item would have in a competitive equilibrium if it were traded via a different method. Auctions do, in fact, address Arrow's complaint that neo-classical economic theory lacks a mechanism for the process of price adjustments. An explicit description of how prices change in response to supply and demand is provided by auction theory. (80)

In conclusion, the tendering theory, which views the tender as a combination of a genuine cost and a separate winning strategy, is not supported by auction theory. Both tendering theory and game theory cannot sustain an equilibrium, as was shown above. (80)

3.4.6. Developments in tendering theory

Despite more recent re-statements of the theory, one of the most thorough was published in 1992 by Park and Chapin and is titled Construction Bidding: Strategic Pricing for Profit. The main interest in the development of tendering theory dates back to the years 1967, when Gates published his paper, up until the early 1980s. As mentioned above, the majority of the discussion has focused on the variations in the odds of success when compared to other builders separately. Without altering the fundamental premise of constant probability density functions, Hanssmann and Rivett , Sugrue, Carr, and Seydel and Olson completely avoided that issue by reformulating the issue as being successful only against the lowest competitive bid. (80)

Several authors have included fundamental neo-classical microeconomic principles into the models. While Goodman and Burmeister, Knode and Swanson, and Willenbrock introduced the possibility of capacity constraints, De Neufville, Hani, and Lesage, Carr, and Willenbrock proposed the maximization of expected utility rather than expected value, and Carr uses opportunity costs rather than money values. Seydel and Olson built a more comprehensive preference function that took into account risk and job continuity in addition to profit to further expand this idea. By defining the capacity limit as the point at which Marginal Cost equals Marginal Revenue, Flanagan and Norman evaluated the effects of approaching the limit in terms of increases in Marginal Cost. Gates has also suggested that there might be various marketplaces with various bidding strategies. (80)

The original tendering theory, which in this case has been assumed to be Friedman's model, extended as a general theory by Park and others, or Gates' model, may be justified in some or all of these variations, and they may also be fully consistent with it. With the possible exception of Flanagan and Norman, they do not contradict either the central behavioral assumption that the preferred strategy is to maximize the expected value, in money or utility, of each bid, nor the assumptions at the heart of tendering theory: the assumption that variations in the competitors' bidding are the results of unsystematic variations in cost estimates and/or markups. Without a doubt, none of the suggested changes have received widespread support. Gates has also

suggested that there might be various marketplaces with various bidding strategies. (80)

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Beeston and Grinyer and Whittaker have both put out more "*radical*" reformulations. When calculating the probability density functions, Beeston recommends smoothing, or giving the most recent occurrences a larger weight and the more distant events a lower weight in proportion. This is the same as saying that Gates' implied tendering theory is fundamentally flawed for calculating tender prices, but if we alter the correspondence rule and abandon the constant probability assumption, what is left—basically Friedman's strategy for a single tender—can be applied as a straightforward, "*naive*" forecasting model that allows for the extrapolation of current trends. This results in a small change of Friedman's method for calculating probabilities, which was made necessary by eliminating the ceteris paribus requirement. (80)

According to Grinyer and Whittaker, variations in market competitiveness occur throughout time, and the issue can be resolved by adding an additional variable called "*managerial judgment*". It seems to be only a small step away from using managerial judgment without going to the trouble of estimating inaccurate probability of success in advance, excepting the issue of phrasing "*managerial judgment*" so that it becomes a meaningful and quantifiable operational variable. This revision, like Beeston's, ostensibly denies the fundamental tenet of the theory. (80)

3.4.7. Implications for tendering theory as a theory of pricing

According to the tendering theory, the tenderer's offer consists of an anticipated cost plus a constant markup in the typical scenario with n unknown competitors. It's possible that this offer or bid doesn't always succeed, but every time it does, the offer

becomes the price, and it stands to reason that the quantity of offers and the likelihood that the contract will be awarded provide an appropriate workload. There is absolutely no difference between this and any other sales scenario when the customer has a choice between numerous sellers and chooses to purchase just one product while implicitly rejecting the offers of all other suppliers. (80)

The optimum markup will likely vary if n changes, which also indicates that the expected value of all markups will probably change. It also might change if one or more competitors are identified as non-typical bids. The key feature of the idea, however, is that short-term variations in demand and/or capacity utilization have no impact on pricing. None of the suggested modifications would change these fundamental aspects of tendering theory.

3.4.8. Criteria for evaluating theories

The ability of the theory to make accurate forecasts, the high informative content of the forecasts, the applicability or realism of the assumptions, consistency with the dominant paradigm, and finally simplicity of the theory are the most frequently cited requirements of theories, despite the fact that there are no universally accepted standards for evaluating theories. We should therefore be able to determine the theory's applicability by assessing tendering theory in some of these areas.

We will now examine how tendering theory handles the impacts of a shift in demand and how it compares to existing empirical studies with regard to the capacity to produce accurate, useful forecasts. We will look at the applicability of the tendering theory's assumptions of the randomness of bids and that tender prices are costs plus a predetermined markup. (80)

3.4.9. A change in demand

The markets for building and construction services are characterized by rapid, significant changes in effective demand. These changes could be 10% or more annually for the sector as a whole, and they could be even more significant for certain markets, often up to 50% or more annually. These changes could take years to fully manifest. When building activity in NSW reached its low point in the middle of 1983, it had decreased by half from its high. Over the six years that followed, however, it increased

by a factor of 2.5. A pricing theory must therefore be able to adequately account for the consequences of changes in demand from the standpoint of information. (80)

Given that systematic changes in strategy are disallowed by assumption, the tendering theory states that a change in demand will not alter tendering behavior. The lowest bid or, alternatively, the average competitor's probability density functions are constant and given, according to the theory of tendering. There is nothing in the theory to imply that this will happen as a result of any change in demand. It specifies that tender prices will only vary if costs, the composition, or the number of competitors change. For the typical scenario with n typical competitors, the markup (profit) is a function of n and will change solely if n changes. (80)

However, empirical research has overwhelmingly demonstrated that prices do alter in reaction to shifts in demand, or more precisely, in tandem with shifts in industry activity. According to De Neufville et al., prices fluctuate with the number of rivals, as predicted by the tendering theory, but they also discovered that the price level varies predictably between "*good*" and "*bad*" years. Carr and Sandahl showed that as demand varies, the tender price fluctuates significantly more than the cost does. Runeson, researching a single market, discovered that prices systematically changed by more than plus/minus 20% over the business cycle in response to changes in the level of activity in the market, even when the number of competitors was held constant. Runeson and Bennett discovered systematic changes in the price level in response to changes in demand and in the utilization of capacity in the industry. According to estimates, variations in demand and capacity utilization—i.e., factors defining market conditions—could account for 85% of these price changes. It was discovered that the number of competitors had only a little impact, with an additional rival lowering the tender price by only 0.7% on average. (80)

Similar findings were made by McCaffer, McCaffrey, and Thorpe, who discovered a strong correlation between price level and competitiveness in the building industry. However, their findings, which were based on a sample taken from several markets, also suggest that market conditions may differ significantly for various building types or regions, suggesting that the industry is in fact split into multiple non-competing markets. The use of so-called Tender Price Indices, which are currently generated in a growing number of nations, often with separate indices for different types of construction and different locations, clearly demonstrates how tender prices move in reaction to market conditions. For example, Sweden publishes two residential building pricing (output) indices: one for medium-density construction and the other for high-density development. These indices frequently move at different rates or in a different direction from the indices of input costs, and occasionally, as in 1976 and 1984, they even move in opposing directions from one another. (80)

Unfortunately, price movements alone cannot prove or disprove the notion. The price level itself is not a concern in tendering theory because markups are the only thing that matter. However, if costs vary, the pricing will also change. A practical way to look at this is that additional production factors must be used in order to increase capacity. The productivity of these new factors is likely to be lower than those previously employed since they are less skilled or specialized, which lowers overall production and raises expenses. It follows a symmetrical pattern. When production capacity is lowered, the less productive production elements leave the industry, resulting in a gain in total productivity and a decrease in cost. This has the potential to have a significant influence. The construction industry's yearly productivity growth rate in the United States fluctuated from -9.3 to +7.4 percent per year between 1950 and 1980. (80)

Obviously, the cost estimate should be affected by this. Additionally, if it is assumed, as was done by Runeson and Bennett, that the average number of bids is a function of the industry's capacity, ups and downs in activity will be accompanied by price fluctuations brought on by shifting numbers of tenderers. Therefore, rather than using the conventional, positivist approach to analysis, the testing of the theory must, at least in part, focus on the process of price formation. This casts some doubt on the validity of any test results because the process cannot be observed in the same way as the result. Motives and intentions may only be assumed; they cannot be seen or measured. (80)

However, the size of the price changes Runeson noted provides some insight. If labor accounts for about 50% of the overall cost of construction, a plus/minus 20% shift in the price of construction during the business cycle would necessitate a 100% rise in productivity from the boom to the bust, which seems excessive. Additionally, it seems that rather than the absolute level of output, as would be expected, the process of change in the level of output influences the price. (80)

Several research have mentioned the alternative hypothesis, which holds that markups are not constant but alter in reaction to shifts in demand. In one of the earliest economic studies of the construction sector, Andrews and Brunner discovered that all builders routinely alter their tendering strategies in reaction to shifts in demand. Numerous unpublished research, including those by Grinyer and Whittaker, Gaver and Zimmerman, Beeston, Upson, Skitmore et al, Harding, Sash, and Abdul-Hadid, as well as Grinyer and Whittaker, Gaver, and Zimmerman, have found that market conditions are a significant factor in mark-up strategy. Additionally, Harrison, March, Hillebrandt and Cannon agree with this. According to Johnston and Skitmore, auxiliary support is given by observed variations in the distribution of bids over time. (80)

It is also well known in other industries that certain price adjustments brought on by quick changes in demand are absorbed in quality modifications. The building business has reportedly experienced the same response.

An extensive analysis of a firm's profit by Chan et al. that covered 221 projects over 28 years likewise discovered a highly substantial correlation between market circumstances and actual profit on specific projects. Varied mark-up strategies used at various stages of the business cycle were the most likely cause of the changes, which were far larger (-26 + 35%) than anything that could be attributable to different numbers of tenderers alone. (80)

Tendering theory can tolerate price changes provided they are industry-wide, but it is unable to accommodate systematic changes in the mark-up strategy. The estimation of the parameters of the competitors' probability density functions will not take into consideration any discernible systematic change in the behavior of any of the competitors. Therefore, it is evident from these empirical investigations that tendering theory, contrary to what bidding strategists claim, does not adequately reflect what transpires in a market for building management services when demand changes. The degree of activity in the market determines the price level, and in the near term, when capacity cannot be changed, the market adjusts to the new situation by changing the price level as the markups of all tenderers in the market change. (80)

3.4.10. Random variations in tenders summary and conclusions

Tendering theory, which bases bids on predicted costs plus a markup in comparison to competitors' constant probability density functions, falls short of explaining the observed tender distribution and instead relies on a variety of ad hoc justifications that are not always particularly likely. Ultimately, it is not necessary for it to yield outcomes that are at odds with the observable variations between bids or behavior, such as that shown by the cusum curve. However, the fundamental tenet of immutable probability density curves needs to be rephrased in order to reflect observable behavior. The behavior necessary to generate a cusum curve depends on illogical assumptions, which undermines a significant portion of the theory's foundation. (80)

The lack of consistency in the theory is the conceptual flaw with tendering theory in this situation. The idea that the results of one tender process are unaffected by the outcomes of earlier events and have no bearing on the outcomes of subsequent tender processes is fundamental to the theory, not because it is static. As a result, there is no market, no price level, no alteration in behavior, and most definitely no learning. This

is supposedly explained by the distinctiveness of each project and the failure to view the firm as the proper unit of analysis rather than the project. (80)

3.4.11. Maximizing profit

The best way to maximize your profit is to increase the expected value of each and every bid. The best way to balance the costs of each event against the gains is to look for the most advantageous combination of probability of success and value of pay-out. This strategy, the maximization of the expected value of each event, is appropriate for a game of poker or betting on horses or any other game for money. According to tendering philosophy, the issue with tendering is that it is not a game of chance for cash. (80)

The challenge is to maximize the return on a specific production capacity rather than to maximize the expected value of a group of possible tenders. The flaw in reasoning ought to be clear. The two goals may only be achieved simultaneously if the company must submit bids for a specified number of contracts and there is no financial penalty for falling short of or exceeding the most likely workload.

Rarely would this be the case. In actuality, there is a choice as to whether to bid for contracts or not, and if a corporation wins a contract, some of its resources are locked up for the period of the deal, preventing it from bidding on other, potentially more lucrative contracts. On the other side, losing a tender may merely mean that the company can submit bids for numerous other contracts, but it may also, in some cases, mean that the firm's resources may be underutilized at great expense for a while. (80)

This argument should be clearly illustrated with a numerical illustration. If we suppose that the bidder will have excess capacity for just one project and examine the following two extreme scenarios: Given that I there are many contracts available for bidding and (ii) there is only one contract available for bidding, it should be clear that maximizing anticipated value is not always the best course of action for maximizing profits. (80)

Tendering theory would suggest that since a mark-up of 3% has the highest expected value (1.5 as compared to 1 for the alternatives), using this mark-up in both of the aforementioned cases would maximize profit. This is assuming that the probability of winning the contract is 1.0 at a mark-up of 1%, 0.5 at 3%, and 0.1 at 10%. However, a logical course of action for the majority of people would probably be to submit enough bids in the first scenario to win the desired contract with a 10% markup, and in the

second instance, to submit a bid with a 1% markup in order to avoid the danger of both making no profit and incurring the cost of holding excess capacity. (80)

Similar evidence can be used to show that the maximization of the expected value of all bids does not maximize the firm's profit in more common, intermediate situations. A more logical course of action would be to alter the markup in the manner suggested by McCaffer's cusum curve. When a company wins a project too soon and has no spare capacity, it must charge more since it incurs costs for running above its maximum capacity, and when it wins it too late, it must carry unutilized capacity. (80)

Ignoring the firm's capability is illogical, as is clear. This is the deviation from Friedman's original model. Friedman's model first provided a straightforward conceptual framework for one or more simultaneous bids rather than a method for sequential bidding with a selection of projects to bid on. As such, it stands for one of many possible logical approaches. Building a set of assumptions that are in line with the maximization of anticipated value as a tactic to maximize profit is challenging. Two crucial presumptions are that the quantity of bids is fixed and that it doesn't matter how much capacity is used as a result of the tendering process. It is particularly challenging to pinpoint the specific conditions in which the latter applies. (80)

3.4.12. The accurancy of estimates

The lack of a standard nomenclature and the indiscriminate use of phrases like "price" or "cost" to describe a variety of extremely disparate notions make it difficult to follow the discussion in the literature on tendering. Even in this context, the word "accuracy" is frequently abused and misused.

It is simple to show that when there are random flaws in the cost estimates that tenders are based on, the tenders will be different, as Fine has done. It does not follow, however, that all or even any observed variations in tenders must be unsystematic and attributable to mistakes in the cost estimates, as tendering theory claims, because random errors in cost estimates will lead to unsystematic disparities in tenders. This specific type of logical mistake, which states that if A, then B, and B exist, so A must be true, is known as affirming the consequent. (80)

There are two issues with using the distribution of bids as a gauge of cost estimating accuracy: Since the accuracy of cost estimates can only be evaluated in relation to actual costs, it follows that I what is calculated is not accuracy but rather conformity to other tenders, which is entirely different, and (ii) it is questionable whether a single

event that is the result of a variety of random influences that were unknown at the time of the estimate can be said to have been estimated accurately or not in any meaningful sense.

Park and Chapin are able to state the following because the accuracy of tenders in terms of actual costs was not evaluated: *"A good detailed estimate should generally be accurate within 5 per cent. Even so, on the average, actual costs may vary by as much as 20 percent from the estimated costs"*. (80)

which is absurd if the goal of an estimate is to determine the cost in reality! However, the statement's consequences are unclear both from the perspective of the authors' logic and from the perspective of tendering theory. There is no indication in the assertion that estimators are able to predict actual expenses. Since most tenders are typically grouped fairly closely together, well within the 20% mentioned, it actually suggests that occasionally, actually quite frequently - for an unknown reason - all estimators make errors of roughly the same magnitude, in the same direction, and at the same time. This necessitates behaviour that is very dissimilar from the rationality assumption that underlies the majority of economic thinking. (80)

If it weren't for the findings of a relatively recent study on the discrepancies between tenders and real cost, Park and Chapin's variances of 20% would be easy to dismiss. Instead, they offer no empirical studies to support their claims. The study, which was based on all new building contracts from a successful firm (n = 221) over a twenty-eight-year period, discovered that the accuracy was actually very low, with the range of differences between tender plus variations and actual costs from -26 to +35% of the tender price and a coefficient of variation of 9.58. (80)

The distribution of gains and losses found in the study was systematic rather than random, as would have been the case if the fluctuations had been the consequence of random errors, and thus presented a serious challenge for the applicability of tendering theory. The project characteristics that created the market and the market environment could account for more than two-thirds of the variances in profit/loss. There is no way to interpret tendering theory in a way that explains why a team of expert estimators would under- or overestimate the actual cost of a project by the amount necessary to achieve this objective all at once, so methodically and with such a high degree of consistency. (80)

3.4.13. Brief recap

The extensive work of the bidding strategists has been sought to find a place in economic theory in this essay. To do this, we have argued for and proposed a method in which a theory is impliedly generated through study of the premises behind Gates' general bidding technique. Then, inasmuch as it is feasible to analyse economic theories like these that offer limited chance for empirical testing, we have subjected this implied theory of tendering to analysis. The conclusion of this review is that the tendering theory, as suggested by Gates, does not perform well in terms of prediction accuracy and informative content, and that the logic contains flaws, particularly with regard to the presumptive behaviour of profit maximization. We have therefore been compelled to draw the conclusion that bidding strategy is an ill-founded required practice, which may be one reason why there is no evidence of its acceptance in practice or major technique development. Bidding strategy has been demonstrated to awkwardly straddle game theory, decision theory, and the theory of auctions. We have provided a number of explanations for the existence of this predicament, including the ongoing "*controversy*" over the method of calculating probabilities, together with the lack of theoretical development in the way of contrasts with mainstream economic theory. While we do not advocate giving up on the field, we do advise caution when developing new approaches for bidding strategy in the lack of an appropriate theoretical foundation. Future bidding models should emphasize the necessity to include information about market conditions. (80)

3.5. Critic to guidelines

In this part of the third chapter, the aim is to analyse the guidelines described in the previous section and attached in the Annex section.

So far, the subjects treated looked nonrelated to one another. Megaprojects, sustainability and IFIs have been widely described and presented. But what is the liaison between these three subjects?

The principal scope of this thesis is to give a partial and initial solution to the problems that megaprojects have experienced, especially in the sector of construction, civil engineering and infrastructures. The main problem is the fact that megaproject using the theory of management of the iron triangle are not as successful as people hoped. As already described, we are missing an important factor, which in my opinion can be identified in the social and environmental sustainability (3P). But sustainability is not the end of the story, because being sustainable has a cost. Respecting the environment

and the interest of all the stakeholder involved in a huge commitment like a megaproject can increase the costs in an important matter, we are talking about millions of dollars giving the nature of these kind of projects.

Now, it is easy to understand that megaprojects need funds and, these funds, will mostly come from the financing of one of these IFIs that we presented in this chapter. It is sad, but money is the main factor, without the funds it is impossible to start any type of project. Having said that, accessing the funds is a critical part of the start of the megaprojects, and in doing so the commissioners are obliged and motivated to do anything in their power to access these funds. So, if we are talking about standards and guidelines imposed by IFIs the commissioning entity will have to comply with that.

Nowadays financial institutions are getting under pressure to push in a more sustainable way. They have criteria and guidelines like the one we presented in the previous section. Reading and analysing the appendices a critic has to be raised. Environmental and social directives are disjointed, to really be effective they should be integrated and be part of the life cycle of megaprojects and projects in general, from the projecting to the construction a management phase, but especially they should be integrated in the bidding phase.

The point here, is that it is not sufficient from IFIs to create and apply these guidelines but, they should make sure that those are implemented and respected also in the lower phases of the life of the megaprojects. These criteria should help to implement social and environmental sustainability to all the stakeholders of a megaproject.

One of the major criticisms of the current approach to evaluating sustainability is that it often fails to take into account the social and environmental aspects of sustainability. The focus is often placed on economic indicators, such as profitability and return on investment, while ignoring the impact that businesses have on people and the planet. This narrow focus can lead to a distorted understanding of sustainability, with companies emphasizing economic performance at the expense of social and environmental responsibility.

Another issue with the current approach to evaluating sustainability is that it is often fragmented. There are numerous sustainability metrics and frameworks in use today, and many of them focus on a specific aspect of sustainability, such as carbon emissions or water usage. While these metrics can be useful in identifying areas for improvement, they often fail to provide a comprehensive view of sustainability, with each framework providing only a piece of the puzzle.

This fragmented approach can lead to confusion among stakeholders, who may struggle to make sense of the various sustainability metrics and frameworks. It can also make it difficult for companies to prioritize sustainability initiatives and allocate resources effectively. With so many different metrics and frameworks to choose from, companies may struggle to know where to start or which initiatives to prioritize.

Overall, it is important to take a more holistic approach to evaluating sustainability, one that includes social and environmental aspects in addition to economic ones. By doing so, we can gain a more accurate understanding of sustainability and ensure that businesses are acting in a responsible and sustainable manner. We also need to work towards a more unified approach to sustainability evaluation, one that brings together the various metrics and frameworks to provide a comprehensive view of sustainability. This will enable companies to prioritize their sustainability initiatives and make more informed decisions about how to allocate their resources.

4 Guidelines for implementing 3P sustainability requirements from IFIs to megaprojects

4.1. Introduction

This final chapter represents the finding of this research work, providing integrated guidelines which, if included into an infrastructure megaproject design and implementation, can help maximising the sustainability ranking of the project from an IFI's perspective and, as a consequence, maximising the probability of being funded.

The objective of this thesis is to write some simple concepts in the form of guidelines to help megaprojects to be more appealing to receive funds from IFIs. To do so, the guidelines are aimed to be implemented from the contracting entity, because it is the only way to encourage a sustainable approach to the megaproject from start to finish.

From the research, the main problem encountered is that all the guidelines and regulation that are out there, are precise and well done, but are hard to implement.

So, how does a construction megaproject work? We start with the need of a determinate construction, usually infrastructures. To build a big infrastructure we need funds, so the contracting entity needs to get these funds, in the case of megaprojects we are talking to comply with IFIs criteria to get funds.

Now, let's say that the contracting entity complies with everything needed to access these funds, for example 3P sustainability. At this point, funds have been unlocked, it is time to start with the designing end the execution of the megaproject.

From the designing phase is important to implement the criteria to respect the concept of 3P sustainability. The problem lays in the fact that the cost has, to this day, too much relevance in deciding the designing and executing features of the projects.

Between the designing and the execution phase, the more relevant phase for this analysis is the execution one, because is the one with the higher cost.

When we think about the execution phase of a construction megaproject, everything starts with the bidding phase. We are going to have numerous enterprises, or groups of enterprises, that would want to win the bidding and execute the construction works. This bidding phase is where the guidelines that will be presented in the next section should be embodied.

From what we learn so far, the main actors of sustainability in megaprojects are People Profit and Planet. The problem is that profit still to this day holds the bigger weight in this bidding phase.

Let's make an example to better understand this concept, to win a bidding there is going to be a proper race between competitors' enterprises, this race is going to have rules and criteria so that the contracting entity can quantify a score and award the project to the best bidding. Of course, if the costs of the project hold the biggest weight in the bidding all the participating companies will try to present themselves with the lowest price, and to do so the enterprises will have to work in the direction of cutting non-essential costs and make speculations.

With this example the problem is obvious, since the bidding phase has rules, and these rules apply to all the companies interested in executing the project, to create more sustainable megaprojects we need different rules in the bidding phase.

The culture needs to change, especially in the light of what we described in previous chapters. Megaprojects have the tendency to run overbudget, so why should we give to the budget itself the biggest weight in the bidding phase? It is time to reduce the impact that the cost of the execution has in bidding race of megaproject and increase the weight of a sustainable approach. Because it is clear that in the long run this is the right approach to use and at the same time it is a way to force construction companies to apply themselves to study and create more sustainable solution, which can open the door to new sustainable practices and technology.

To date, construction companies during the execution putt all the effort into creating the cheapest end fastest way to execute the work, because in the bidding phase they already tried their best to cut costs to win the bidding and signed a contract promising such performances to be delivered. If this philosophy can be changed and redirect the effort of private construction companies into creating a more sustainable process, we will obtain the results that the literature is hoping for but that the reality to this day is not reflecting.

4.2. Guidelines

This section is dedicated in fully to the presentation of the guidelines. Of course, these criteria have been kept simple on purpose, because the simplest they are the easier will be to implement them.

To draft these guidelines a work of cross referencing has been made. Four main documents have been studied a cross referenced, which are:

- "Official Journal of the European Union, Regulations, COMMISSION DELEGATED REGULATION (EU) 2021/2139, of the 4th June 2021, *supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives"*

- "COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT, Commission Delegated Regulation (EU), 4th June 2021, supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives"

- "GUIDELINES FOR ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT, Cement Sustainability Initiative (CSI)"

- "EQUATOR PRONCIPLES", EP4, July 2020

These documents have been chosen because, all four of them present some sort of guidelines to sustainability based on research.

The guidelines presented here after will be divided in two categories: social and environmental. It is important to note that the work done has been calibrated specifically on megaprojects in civil engineering, construction, and infrastructures.

4.2.1. Environmental Guidelines

1. Forestry: **Megaprojects that involve deforestation activities, should commit to the afforestation of the same area.**

Construction megaprojects are known to widely change and impact the area and the landscape in the concerned zone. With this guideline the aim is to make companies commit in the reforestation when deforestation in implicated.

The evaluation of this criteria is thought to classify the percentage of the surface subjected to deforestation that is expected to be subjected to reforestation.

A: 100-75 % of the area

B: 75-50 % of the area

C: 50-25% of the area

D: 25-0 % of the area

2. Renewable energy consumption: **Megaprojects should commit to maximize the consumption of renewable energies**.

It is well known that megaprojects have a high consumption of energy. This guideline has the objective to promote the use of renewable energy and/or his production onsite.

The evaluation of this criteria is thought to classify the percentage of renewable energy expected to be used in the megaproject.

A: 100-75 % of the energy consumed

B: 75-50 % of the energy consumed

C: 50-25% of the energy consumed

D: 25-0 % of the energy consumed

3. Water management: **Megaprojects should minimize the usage of water**.

Construction megaprojects require the usage of big amounts of water, for construction activities and for the workers. This criterion aims at encouraging enterprises to think and develop sustainable solution to minimize the water consumption.

The evaluation of this guideline wants to classify the solution proposed by the enterprises.

A: Sustainable and efficient

B: Sustainable

C: Basic

D: Not sustainable

4. Water management: **Megaprojects should maximize the reuse of wastewater**.

It is well known that construction megaprojects produce high quantities of wastewater. This guideline aims at incentivizing the reusage of wastewater.

The evaluation of this criteria wants to classify the expected percentage of wastewater reusage.

A: 100-75 % of wastewater reused

B: 75-50 % of wastewater reused

C: 50-25% of wastewater reused

D: 25-0 % of wastewater reused

5. Plastic free: **Megaproject should have a plastic free approach on site.**

Megaprojects employ a lot of workers; this guideline aims at incentivizing enterprises to implement a plastic free approach.

This criterion wants to evaluate the solutions proposed.

A: Sustainable and efficient

B: Sustainable

C: Basic

D: Not sustainable

6. Transport: **Megaprojects should prioritize local suppliers**.

Megaproject need during the execution phase numerous and various suppliers. This guideline aims at incentivizing the employment of local suppliers.

The evaluation of this criteria wants to classify the expected percentage of employment of local suppliers.

A: 100-75 % of suppliers come from the region

B: 75-50 % of suppliers come from the region d

C: 50-25% of suppliers come from the region

D: 25-0 % of suppliers come from the region

7. Transport: **Megaprojects should create sustainable condition for the transport of the workers.**

Megaprojects employ a lot of workers; this guideline aims at incentivizing enterprises to create sustainable logistic for the transport of his workers.

This criterion wants to evaluate the solutions proposed.

A: Sustainable and efficient

B: Sustainable

C: Basic

D: Not sustainable

8. Materia recycling: **Megaprojects should minimize human caused waste.**

Megaprojects produce a lot of waste materials; this guideline aims at incentivizing enterprises to reduce waste to the minimum.

The evaluation of this criteria wants to classify the expected percentage of waste production.

A: 25-0 % of waste production

B: 50-25 % of waste production

C: 75-50 % of waste production

D: 100-75 % of waste production

9. Transport: **Megaprojects should apply state-of-the-art solutions and technologies.**

Megaprojects offer the perfect opportunity to implement and test state-of-the-art solution and technologies, this guideline aims at incentivising technical progress.

This criterion wants to evaluate the solutions proposed.

A: Sustainable and efficient

B: Sustainable

C: Basic

D: Not sustainable

4.2.2. Social Guidelines

1. Employment: **Megaprojects should incentivize the hiring of local workers**.

Megaprojects employ a lot of workers; this guideline aims at incentivizing enterprises to create sustainable logistic for the transport of his workers.

The evaluation of this criteria wants to classify the expected percentage of employment of local workers.

A: 100-75 % of workers come from the region

B: 75-50 % of workers come from the region

C: 50-25% of workers come from the region

D: 25-0 % of workers come from the region

2. Transparency: **Megaprojects should implement transparency.**

Megaprojects, due to their longevity, impact local communities for a great period; this guideline aims to promote transparency between stakeholders.

This criterion wants to evaluate the solutions proposed.

A: once a week debrief

B: once a month debrief

C: once every three-months debrief

D: once every six-months debrief

3. Gender equality: **Megaprojects should create and promote an inclusive work environment.**

Megaprojects, especially in the construction field, lack of gender equality.

This criterion wants to evaluate the expected employment of woman in executive and technical roles.

A: 50-35 % of woman employees in executive and technical roles

B: 35-20 % of woman employees in executive and technical roles

C: 20-10 % of woman employees in executive and technical roles

D: 10-0 % of woman employees in executive and technical roles

4. Availability for field research: **Megaprojects should promote field research on site.**

Megaprojects, due to their peculiar nature, can most times offer the opportunity to include some scientific/social research.

This criterion wants to evaluate the expected number of research during the Megaproject.

A: one or more research every three months

B: one or more research every six months

C: one or more research every year

D: less than one research a year

5. Employee awareness: **Megaprojects should incentivize the education of his employees on sustainability.**

Megaprojects withe their high number of workforces offer a unique possibility to raise awareness on sustainability related subjects.

This criterion wants to evaluate the solutions proposed.

A: Sustainable and efficient

B: Sustainable

C: Basic

D: Not sustainable

6. Services for employees: **Megaprojects should offer his workforce multiple services.**

Megaprojects employ a lot of workers; this guideline aims at incentivizing enterprises to create sustainable services for his workers (canteen, locker rooms, changing rooms, break rooms etc).

This criterion wants to evaluate the solutions proposed.

A: Sustainable and efficient

B: Sustainable

C: Basic

D: Not sustainable

7. Food security: **Megaproject should pay close attention to the food and beverages provided on site.**

Megaprojects employ a lot of workers; this guideline aims at incentivizing enterprises to provide sustainable food and beverages, considering availability, access, utilisation, and stability.

This criterion wants to evaluate the solutions proposed.

A: Sustainable and efficient

B: Sustainable

C: Basic

D: Not sustainable

8. Training local communities: **Megaproject should pass to local community technical know-how.**

Megaprojects, due to their complexity, offer a unique opportunity to form local communities on technical subjects. This guideline aims at incentivizing enterprises to offer courses on their technical know-how.

This criterion wants to evaluate the solutions proposed.

A: Sustainable and efficient

B: Sustainable

C: Basic

D: Not sustainable

4.2.3. Guidelines Summary

The guidelines have been summarized in Table 1.

No.	Guideline	Unit	A	B	C	D
Environmental						
1	Megaprojects that involve deforestation activities, should commit to the afforestation of the same area	Square meters	100-75 %	75-50 %	50-25%	25-0 %
2	Megaprojects should commit to maximize the consumption of renewable energies	kWh	100-75 %	75-50 %	50-25%	25-0 %
3	Megaprojects should minimize the usage of water	Liters	Sustainable and efficient	Sustainable	Basic	Not sustainable

4	Megaprojects should maximize the reuse of wastewater	Liters	100-75 %	75-50 %	50-25%	25-0 %
5	Megaproject should have a plastic free approach on site	Tons	Sustainable and efficient	Sustainable	Basic	Not sustainable
6	Megaprojects should prioritize local suppliers	%	100-75 %	75-50 %	50-25%	25-0 %
7	Megaprojects should create sustainable condition for the transport of the workers	Qualitative	100-75 %	75-50 %	50-25%	25-0 %
8	Megaprojects should minimize human caused waste	Tons	25-0 %	50-25%	75-50 %	100-75 %
9	Megaprojects should apply state-of-the-art solutions and technologies	Qualitative	Sustainable and efficient	Sustainable	Basic	Not sustainable
Social						
1	Megaprojects should incentivize the hiring of local workers	%	100-75 %	75-50 %	50-25%	25-0 %
2	Megaprojects should implement transparency	Qualitative	Once a week	Once a month	Once every 3 months	Once every 6 months

3	Megaprojects should create and promote an inclusive work environment	Qualitative	50-35 %	35-20 %	20-10 %	10-0 %
4	Megaprojects should promote field research on site	Nr.	≥1 every 3 months	≥1 every 36months	≥1 every year	<1 every year
5	Megaprojects should incentivize the education of his employees on sustainability	Qualitative	Sustainable and efficient	Sustainable	Basic	Not sustainable
6	Megaprojects should offer his workforce multiple services.	Nr.	Sustainable and efficient	Sustainable	Basic	Not sustainable
7	Megaproject should pay close attention to the food and beverages provided on site	Qualitative	Sustainable and efficient	Sustainable	Basic	Not sustainable
8	Megaproject should pass to local community technical know-how	Qualitative	Sustainable and efficient	Sustainable	Basic	Not sustainable

Table 1: Guidelines Summary

To facilitate the implementation of these guidelines, I'm proposing a score system as well which will be summarized in the following table.

Grade	A	B	C	D
Points	10	8	5	3

Table 2: Score system

The score system proposed will help commissioning entities in quantifying and deciding a threshold for a more sustainable bidding process in megaprojects.

As already stated in the introduction part of this chapter, these guidelines are thought to be implemented in the bidding phase. Highlighting this aspect in the bidding phase and reducing the weight of the expected price should help megaprojects become more sustainable and in doing so reducing the risk of running overbudget.

5 Conclusions

The aim of this work is to create a simple and linear path for megaprojects to get access to "green funds". Sustainable finance, being a relatively recent concept, needs regulation to be properly implemented. To this day, as it has been explained in this thesis, the rules and guidelines exist, but are fragmented and they don't give a univocal approach. This work tries to unify the already existent fragmented regulation into a unique set of guidelines, with the scope of helping megaprojects implement a more sustainable approach and become a more attractive investment.

At the beginning of this thesis, megaprojects have been analysed and presented highlighting the main problems that come with this type of huge undertaking. Through the literature of megaprojects, the difference between the success of a megaproject and the successful management of a megaproject has been highlighted. Another key feature is the role of stakeholders, megaprojects involve numerous stakeholders due to his gigantic nature, and these stakeholders are the first ones to experience the positive or negative consequences of a megaprojects in construction, infrastructure, and civil engineering. Considering all the different stakeholders is one of the biggest challenges of a megaproject.

To the problems individuated in megaprojects a simple solution has been presented, the implementation of the 3P sustainability model. In Chapter 2 of this work sustainability and, more specifically the 3P model has been presented and linked to megaproject as a solution to most of the issues. The 3Ps, people, planet and profit represent the base of a successfully managed megaproject. These 3P's are strongly linked the various stakeholders touched by a megaproject and the sustainable approach is in individuating all the stakeholders and try to find acceptable and sustainable solutions for all the parties involved.

But sustainability and, his implementation alone is not enough, because to give a fair chance to the managing entities of megaprojects to accomplish a sustainable process they need the concept of "upstream sustainability". Upstream sustainability simply means that, to properly incorporate sustainability in the core of megaprojects it must be present in his DNA since the very beginning of the conception of the project. As all the stakeholders should be taken into account, also financial institutions should be facilitated to do their job. Megaprojects due to their complicated nature have turned into a risky investment since they usually tend to go overbudget.

Funds, that's what is needed to give birth to a megaproject, and this is the stage where sustainability should start to make his presence felt. Chapter 3 focuses his attention to

the IFIs and their role and their limitations, mainly individuated in a not very clear policy regarding the founding of megaprojects and how sustainability should be implemented. Numerous documents from various institutions exist and try to draw a path, but the lack of a univocal guidelines creates confusion and uncertainty. This is where the work produces in this thesis really tries to focus his effort.

Always in Chapter 3 the last bibliographical part is presented: the Tender Theory. This is the part that really binds the work together. The bidding phase is exactly when the free market and the competition between enterprises comes into play, so this is the stage where sustainability can be incentivized and regulated. Reducing the importance of the price and empowering the role of sustainability in the bidding phase will stimulate enterprises to find sustainable and efficient solutions for the executions of megaprojects end, at the same time will transform megaprojects in a more attractive investment for the IFIs. It has been explained how megaprojects tend to run overbudget, with a more sustainable management of megaproject this problem can be avoided, but to do so the effort must start in the earliest phases of a project, the bidding phase is one of them. Creating a new generation of rules governing the tender offer of megaprojects integrating sustainability with the 3P model could really create a new future for megaprojects.

In the last chapter a simple solution in the form of guidelines to be implemented in the bidding phase of a megaproject in civil engineering and infrastructure is presented. Chapter 4 represents a simple way to evaluate and incentivize a more sustainable approach in the execution of megaprojects. The guidelines have been drafted following the study of four different documents, in which numerous guidelines and concepts on sustainability have been presented. These documents have different forms and contents, the work done in Chapter 4 was to cross reference these four documents, find common ground between them and extrapolate simple concepts to present has guidelines. The guidelines present have been divided into two main categories: social and environmental. As per the technical structure of the guidelines some examples have been followed, one of which is presented in Annex A to this work.

The findings have been integrated into a coherent framework that can be used by practitioners for achieving the maximum level of sustainability in order to be attractive for IFIs' investments. The integration of the guidelines presented in Chapter 4, into the awarding criteria of the bidding process of a megaproject, will incentivize a more sustainable process in the execution of megaprojects. Another important aspect is that always in the bidding phase, sustainability has a bigger weight than the price in the adjudication process. It has widely been explained, how a more sustainable approach to megaprojects can reduce the costs on the long term. If the weight of the price continues to hold a prominent role in the tender offer, enterprises will continue to try

to cut costs to the minimum disregarding the sustainable aspect of the project, instead if sustainability will be incentivized in the bidding phase reducing the weight of the costs we will find ourselves with a bidding phase constituted of enterprises in competition between themselves to find more efficient and sustainable solutions, which on the long run will reduce costs as well.

The guidelines presented will give the opportunity to the IFIs to set thresholds and to better monitor megaprojects. In doing so the funding institutions can look at megaprojects as safer and more profitable investments, giving them the possibility to unlock "green funds". With these guidelines, and the score system associated, IFIs can really customize the rules of tender to pursue the aspects of sustainability that they find more important, or those aspects that have more relevance for sustainable finance.

The research presented in this work is purely theoretical and the solution presented in Chapter 4 is at the same time very simplistic and utopian. It is going to be very clear for whoever experts reads the guidelines drafted that for most of them is almost impossible to reach a good score. Nonetheless this work should serve also as a provocation to motivate enterprises to study and find innovative technical solution aimed at a more sustainable process without thinking about the expenses. Also, the geographical aspect plays an important role, it is obvious that depending on the geographical location of a megaprojects a lot of things can change, from the legislation to the availability of certain resources end technical abilities.

The main limitation of the work presented consists in the lack of documentation present, the regulation is fragmented and produced by very different entities with different scopes a specific interest. Also, the concept of sustainability is constantly evolving, it is getting more and more attention and different aspects are emerging creating new challenges.

The work presented in this thesis can be implemented and improved, integrating to the theoretical research some field research. Studying actual cases of construction megaprojects and interviewing all the stakeholders involved con improve and maybe confirm the work done so far. The stakeholders touched and influenced by megaprojects are numerous and depending on the geopolitical situation of a megaprojects can also be very different. It is very important to fully understands the needs of all the stakeholders that gravitate around a megaproject, in order to develop the sustainability model and to upgrade and integrate the guidelines proposed in Chapter 4.

In conclusion, it is important to note that the working experience of the Author has played a significant role in shaping the ideas presented in this thesis. As a person who

works in the tender office of a construction company, the Author has seen firsthand the limitations of the current system and the challenges faced by companies bidding on construction projects in civil engineering and infrastructures. This experience has motivated the Author to explore the concept of sustainability and the 3P model as a potential solution to these challenges.

Through research, the Author has developed a set of guidelines that he believes can help to promote a more sustainable bidding process in megaprojects. By emphasizing the importance of stakeholder engagement, long-term thinking, and a focus on social and environmental impacts, these guidelines can help to ensure that megaprojects are designed and managed in a way that is both financially viable and socially and environmentally responsible.

The Author is hopeful that the work produced in this thesis will contribute to a broader conversation about the importance of sustainability in megaproject management. By raising awareness of the challenges faced by megaprojects and the potential solutions available, the hope is to encourage a cultural shift towards greater emphasis on sustainability and collaboration between stakeholders.

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A Appendix A

Annex I. Diagnostic Tool for Bilateral Creditors and their Agencies

Dimension & Principles
1. Adequacy of Financing 1.1. Safeguarding debt sustainability 1.2. Providing various financing options-by making available various financing opt 1.2.1. Flexible financing options 1.2.2. Provision of collateralized debt
2. Information-sharing and transparency 2.1. Building a common understanding of the macroeconomic and financial situation- by enhancing information sharing by creditors 2.1.1. Sharing information on existing and new lending 2.1.2 Creditors reconciling data with borrowers and IFIs 2.1.3 Contractual clauses 2.2. Encouraging fiscal transparency and debt management 2.3. Promoting disclosure of information on past restructurings 2.3.1. Post-restructuring data reconciliation 2.3.2. Public disclosure of participation in debt restructuring
3. Consistency of financial support 3.1. Providing financing consistent with IMF and WB debt limit policies 3.2. Facilitating smooth debt restructuring when needed 3.3. Providing technical assistance on debt-related issues
4. Coordination of stakeholders 4.1. Conducting regular dialogue with stakeholders 4.2. Facilitate dialogue among IFIs to promote coordinated policies
5. Promoting contractual and financial innovation and minimizing litigation issues to strengthen resilience 5.1. Continuing to work on financial innovation in lending 5.2. Promoting enhanced contractual clauses in foreign-law sovereign bond issuances 5.3. Addressing the challenge posed by some litigating creditors

1. Adequacy of Financing
1.1. Safeguarding debt sustainability
☐ Strong: The creditor has an internal framework for debt sustainability assessments, also informed by private sector or IFIs existing frameworks, which guides borrowing volumes or terms. ☐ Sound: The creditor has an internal framework for debt sustainability assessment in place, which guides borrowing volumes or terms. ☐ Room for Improvement: The creditor does not have a framework in place that informs lending based on debt sustainability considerations.
Comments:
1.2. Providing various financing options
1.2.1. Flexible financing options ☐ Strong: The creditor provides a range of financing terms that enable borrowers to mitigate risks of the debt portfolio at reasonable costs. ☐ Sound: The creditor provides a limited menu of financing terms to borrowers. ☐ Room for Improvement: The creditor does not provide for much flexibility on financing terms.
Comments:
1.2.2. Provision of collateralized debt ☐ Strong: The creditor uses best efforts to ensure a collateralization structure does not breach applicable NPCs, provides full transparency on the contractual terms of the collateralized debt (including the collateralization structure), focuses on related assets or revenue streams, and reflects the reduced risks resulting from collateralization in improved financial terms. ☐ Sound: The creditor uses best efforts to ensure a collateralization structure does not breach applicable NPCs, focuses on related assets or revenue streams, and provides full transparency on the contractual terms of the collateralized debt (including the collateralization structure). ☐ Room for Improvement: The creditor provides collateralized lending without improving financial terms and information is not made publicly available.
Comments:

2. Information-sharing and transparency
2.1. Building a common understanding of the macroeconomic and financial situation of the borrower country—by enhancing information sharing by creditors
2.1.1. Sharing information on existing and new lending ☐ Strong: A government agency collects and publishes loan-by-loan information on its country's official creditor agencies vis-a-vis borrowers yearly on a single website, and updates it within three months on new lending, including financial terms. ☐ Sound: Government creditor agencies disclose all loan-by-loan information, including financial terms, to the IMF and the World Bank, on existing exposure to borrowers and new lending at least on an annual basis. ☐ Room for Improvement: No or limited information on exposure and new lending is made available on a yearly basis.
Comments:
2.1.2. Creditors reconciling data with borrowers and IFIs ☐ Strong: The creditor undertakes data reconciliation with borrowers at least on an annual basis and with IFIs upon request. ☐ Sound: The creditor undertakes data reconciliation with borrowers on an annual basis. ☐ Room for Improvement: The creditor does not undertake regular data reconciliation with borrowers.
Comments:
2.1.3. Contractual Clauses ☐ Strong: The creditor uses publicly available templates for financing agreements and refrains from confidentiality clauses. ☐ Sound: The creditor refrains from using confidentiality clauses with respect to information sharing with the IMF and the World Bank. ☐ Room for Improvement: The creditor uses comprehensive confidentiality clauses.
Comments:

2.2. Encouraging borrowing countries to continue to enhance fiscal transparency and public debt management
☐ Strong: The creditor, in addition to ensuring that the borrower meets its own legal requirements (and only proceeding if it does), verifies that lending operations are adequately disclosed ex-post in public debt statistics. ☐ Sound: The creditor verifies that the lending operation is in adherence with the borrower's primary and secondary legislation and that the amount of financing appropriately reflects the value of the project. If this is not the case, the creditor does not proceed with the operation. ☐ Room for Improvement: The creditor proceeds with lending operations without enquiring whether the lending operation is in adherence with the borrowing country's primary and secondary legislation and that the amount of financing appropriately reflects the value of the project.
Comments:
2.3. Promoting disclosure of information on past restructurings
2.3.1. Post-restructuring data reconciliation ☐ Strong: The creditor conducts a post-debt restructuring data reconciliation with the borrower, ensuring accurate reflection and public availability of changed terms and conditions in the official debt data. ☐ Sound: The creditor conducts a post-debt restructuring data reconciliation with the borrower, ensuring accurate reflection of changed terms and conditions in the official debt data. ☐ Room for Improvement: The creditor does not undertake post debt restructuring data reconciliation with the borrower.
Comments:

2.3.2. Public disclosure of participation in debt restructuring

☐ Strong: The creditor publishes information about its participation in debt restructurings, and details on its contribution, including amounts and changes in terms, in a press release or on the agency's web site.

☐ Sound: The creditor makes public its participation in debt restructuring in a press release or the agency's web site.

☐ Room for Improvement: The creditor does not make public its participation in debt restructuring.

Comments:

3. Consistency of financial support

3.1. Providing financing consistent with IMF/WB debt policies

☐ Strong: The creditor seeks, on a best effort basis, assurances with the appropriate borrowing country authorities that the new financing is consistent with the IMF's Debt Limits Policy (DLP), IDA's Non-Concessional Borrowing Policy (NCBP) and Sustainable Development Finance Policy (SDFP), and the World Bank's Negative Pledge Clause (NPC,) and clarifies any technical questions with the IMF and/or World Bank as needed.

☐ Sound: The creditor seeks, on a best effort basis, assurances with the appropriate borrowing country authorities that the new financing is consistent with the IMF's DLP, IDA's NCBP and SDFP, and the World Bank's NPC.

☐ Room for Improvement: The creditor does not seek on a best effort basis to ensure compliance with the IMF's DLP, IDA's NCBP and SDFP, or the World Bank's NPC when contemplating new financing operations.

Comments:

3.2. Committing to the long-term debt sustainability of borrowing countries – by facilitating smooth debt restructurings when needed

☐ Strong: The creditor has a debt restructuring framework in place, that is conducive to providing required relief in a timely fashion, and participating in a collaborative approach with other creditors, when appropriate.

☐ Sound: The creditor has a debt restructuring framework in place.

☐ Room for Improvement: The creditor does not have a debt restructuring framework in place.

Comments:

3.3. Providing technical assistance on debt related issues
☐ Strong: The creditor, when encountering insufficient understanding of financing terms or capacity on the borrower's side, provides technical assistance in coordination with the WB and IMF or requests such from IFIs. ☐ Sound: The creditor takes steps to ensure the borrower's understanding of the financing terms of the loan in every lending operation, including on associated costs and the risks. ☐ Room for Improvement: The creditor does not ensure the borrower's understanding of financing terms of lending, including associated costs and risks.
Comments:
4. Coordination of Stakeholders
4.1. Conducting regular dialogue with stakeholders
☐ Strong: The creditor, in addition to participating in regular dialogue with other stakeholders through international meetings on debt related issues, promotes discussions on specific methodological or operational issues where relevant. ☐ Sound: The creditor participates in dialogue with other stakeholders through international meetings on debt related issues. ☐ Room for Improvement: The creditor does not engage in regular dialogue with other stakeholders.
Comments:
4.2. Facilitating dialogue among international financial institutions to promote coordinated policies
☐ Strong: The creditor takes steps to encourage interaction between the IMF, the World Bank, and other IFIs, and takes an active role in promoting coordination on debt related issues. ☐ Sound: The creditor takes steps to encourage interaction between the IMF, the World Bank, and other IFIs. ☐ Room for Improvement: The creditor does not promote inter-agency coordination.
Comments:

5. Promoting of contractual and financial innovation and minimizing litigation issues to strengthen resilience
5.1. Continuing to work on financial innovation in lending and enhancing resilience to shocks
☐ Strong: The creditor, in addition to supporting initiatives that explore and develop financing solutions to enhance resilience to shocks as a member of international fora, offers and promotes, when relevant, financial instruments that embed more resilience into the debt structure of the borrower country. ☐ Sound: The creditor, as a member of international fora, supports initiatives that explore and develop financing solutions enhancing resilience to shocks. ☐ Room for Improvement: The creditor does not actively engage in exploring new innovative financing options.
Comments:
5.2. Promoting enhanced contractual clauses in foreign-law sovereign bond issuances
☐ Strong: The creditor, in addition to meeting sound practice, promotes enhanced contractual clauses (modified *pari passu* and enhanced collective action clauses) by providing or supporting coordinated technical assistance in this area. ☐ Sound: The creditor includes enhanced contractual clauses (modified *pari passu* and enhanced collective action clauses) when it issues international sovereign bonds. ☐ Room for Improvement: The creditor does not actively engage in supporting enhanced contractual clauses.
Comments:

5.3. Addressing the challenges posed by some litigating creditors
☐ Strong: The creditor, in addition to supporting initiatives to enhance monitoring of litigation by non-cooperative minority creditors and seek appropriate ways to take action, provides or supports technical assistance to countries with limited capacity in addressing litigation challenges. ☐ Sound: The creditor supports initiatives to enhance monitoring of litigation by non-cooperative minority creditors and to seek appropriate ways to take action. ☐ Room for Improvement: The creditor does not support initiatives to enhance monitoring of litigation by non-cooperative minority creditors and to seek appropriate ways to take action.
Comments:

Annex II. Guidance Note

1. Adequacy of Financing

1.1 Safeguarding debt sustainability
Creditors should take the borrower's debt sustainability situation into account when deciding on extending financial support to avoid raising debt vulnerabilities. This requires an internal governance structure that places debt sustainability as a leading consideration for all government agencies when providing financing to other governments or their agencies. Creditors may rely on various models for assessing debt sustainability, including the Joint IMF-World Bank debt sustainability analysis (which is publicly available, based on extensive consultations and reviews, and reflects a broad understanding of debt risks in developing countries).
ST: The creditor has an internal framework for debt sustainability assessment, also informed by private sector or IFI's existing frameworks, which guides borrowing volumes or terms. SD: The creditor has an internal framework for debt sustainability assessment in place, which guides borrowing volumes or terms. RfI: The creditor does not have a framework in place that informs lending based on debt sustainability considerations.
METHODOLOGICAL NOTES Practice 1.1 consists of two elements, the availability of a debt sustainability analysis, and whether the analysis guides borrowing volumes and terms or the provision of grants. Debt sustainability assessments might include international credit rating reports (e.g., Euromoney, Institutional Investor International Country Risk Guide, Business Environment Risk Information); OECD country risk classifications; the Joint IMF-WB Debt Sustainability Framework. Relying on any of these but without an internal model would support a "sound" categorization. As regards "guiding borrowing volumes or terms", adjustments to the financing mix based on debt sustainability considerations could include: cancelling the loan provision; adapting the financing mix (e.g., by applying a higher grant element through applying lower interest rates); or other similar adjustments. If debt sustainability assessments do not guide borrowing terms and conditions, a rating of with *room for improvement* should be applied. For a sound rating, only one method of adjustments is offered (e.g., only the possibility of cancelling the loan provision), and for a strong rating more than one method is offered.

1.2 Providing various financing options
1.2.1 Flexible financing options
Creditors can offer a variety of financing instruments and lending terms to enable borrowing countries to contract grants, or loans that mitigate costs and risks of their existing debt portfolio.
ST: The creditor provides a range of financing terms that enable borrowers to mitigate risks of the debt portfolio at reasonable costs. SD: The creditor provides a limited menu of financing terms to borrowers. Rfl: The creditor does not provide for much flexibility on financing terms.
METHODOLOGICAL NOTES The range of financing terms considered for the evaluation of this practice would sit broadly within three categories: grants, concessional financing, and non-concessional financing. If a creditors' agencies offer at least of two out of these three categories, the creditor is classified as sound. Creditors that in addition offer flexible financing options within at least one of the categories (e.g., lengthening maturities to avoid bunching of debt service with other loans; or adapting grace/ amortization periods; or offering loans in different currencies), are considered *strong*.
1.2.2 Provision of collateralized debt
Collateralized debt can be a means for providing financing on reasonable terms for countries with debt vulnerabilities. However, by delinking debt sustainability from repayment capacity, it also presents risks for delayed adjustment and overborrowing and, by earmarking future revenues, reduces future policy flexibility. In addition, the increased seniority may lead to increased borrowing costs for conventional credit and will complicate any debt resolution efforts if such are needed.

ST: The creditor uses best efforts to ensure a collateralization structure does not breach applicable NPCs, provides full transparency on the contractual terms of the collateralized debt (including the collateralization structure), focuses on related assets or revenue streams, and the reduced risks resulting from collateralization are reflected in improved financial terms. SD: The creditor uses best efforts to ensure a collateralization structure does not breach applicable NPCs, focuses on related assets or revenue streams, and provides full transparency on the contractual terms of the collateralized debt (including the collateralization structure). Rfl: The creditor provides collateralized lending without improving financial terms and information is not made publicly available.
METHODOLOGICAL NOTES Collateralized lending should be understood as any lending where the borrower pledges an asset or future receivable to the creditor as recourse in case the borrower defaults on the debt. A negative pledge clause (NPC) is essentially a contractual clause that restricts the ability of a borrower to pledge an asset or future income stream to another creditor. This restriction takes different forms, including by outright prohibiting the granting of pledges or by requiring that the original creditor be treated equivalently. Related assets or income streams are those which the collateralized lending directly gives rise to. For instance, trade credit is usually collateralized by the goods in question; and project finance is often collateralized by an income stream generated by the financed project (e.g., the tolls for a bridge project) Improved terms and conditions should be understood in the context of 1.2.1: when options are offered by a creditor, if collateral is one option, then other terms and conditions (e.g., interest rate, maturity terms) should become more advantageous to the borrower compared to non-collateralized options. In the event the creditor does not offer non-collateralized financing options, the other terms and conditions should be more advantageous in relation to terms and conditions of available non-collateralized lending from other creditors. In all cases the comparison should take into account the additional costs that are usually involved in collateralized debt such as export credit premia, remuneration of financial intermediaries, and legal costs. Full transparency should be understood in the context of 2.1.1 to encompass publication of the size and the terms of the loan, the collateral arrangements that are being used and the amount of collateral provided. If relevant creditor institutions do not provide any collateralized lending, this practice should be rated as *not applicable* (n/a).

2. Information Sharing and Transparency

2.1 Building a common understanding of the macroeconomic and financial situation of the borrower country—*by enhancing information sharing by creditors*
Accurate and comprehensive information on borrower' debt profiles is needed for creditors to make informed decisions regarding new financial operations. Therefore, creditors should facilitate information sharing among themselves and with the IFIs by disclosing comprehensive and updated information on their existing and new lending operations. The information provided should be sufficiently detailed to allow for accurate assessment of the structure of the debt and potential debt vulnerabilities. Contractual clauses that limit the disclosure of volume, terms or other conditions should be avoided. In this context, regular data reconciliation with the borrower is key to prevent operational errors or misinterpretation of the agreements that could undermine the soundness of the debt data.
2.1.1 Sharing information on existing and new lending
ST: A government agency collects and publishes loan-by-loan information for all of its country's official creditor agencies vis-a-vis borrowers on a single website, and updates it within three months of new lending, including financial terms. SD: Government creditor agencies disclose all loan-by-loan information, including financial terms, to the IMF and the World Bank, on existing exposure to borrowers and new lending at least on an annual basis. Rfl: No or limited information on exposure and new lending is made available on a yearly basis.
METHODOLOGICAL NOTES The type of data to be made available include (but should not be limited to): the amount; the beneficiary; the use of proceeds; the interest rate; the maturity and grace period; and the structure of the collateral and the amount of collateral provided if relevant. Reporting options in line with sound practices include individual lenders' public reports, information published on their websites, and others. Disclosure in line with strong practices, however, requires publishing relevant information on a single government web site. Membership in the OECD should be used to assess compliance as consistent with *sound* practices, since OECD members report loan-by-loan information for their export credit agencies to the IMF and the World Bank.

2.1.2 Creditors reconciling data with borrowers and IFIs
Accurate data is necessary for debt analytics, including medium-term debt management strategies and debt sustainability analysis. Differences in the underlying data between creditors and borrowing country introduce uncertainties, weaken the quality analysis and may damage creditor-borrower relationships. Hence, all possible efforts should be undertaken by creditors and borrowers to eliminate data inaccuracies and inconsistencies.
ST: The creditor undertakes data reconciliation with borrowers at least on an annual basis and with IFIs upon request. SD: The creditor undertakes data reconciliation with borrowers on an annual basis. RfI: The creditor does not undertake data reconciliation with borrowers.
METHODOLOGICAL NOTES Creditors should reconcile all debt instruments and guarantees with borrowers to ensure that they were recorded in the same way in their respective debt monitoring systems. Discrepancies can arise due to recording errors, including when there are changes in loan terms and conditions. Data reconciliation should be conducted periodically as a standard exercise; upon request by the authorities; in case of arrears; in the context of a WB/IMF program; upon detection of missing large public liabilities in the DSA of a borrower country; or upon some other eventuality. Such exercise should comprise all contractual obligations and include all lending agencies. Creditors that do not conduct annual reconciliations with the authorities (except upon request or in the event of arrears) should be rated with *room for improvement*. Creditors that report conducting annual reconciliations with borrowers should be rated *sound*. Countries that conduct periodic data reconciliations with borrowing authorities and check data recorded by IFIs in the context of an IMF program, and additionally also conduct reconciliations at the request of borrowers and IFIs should be rated as *strong*. Membership in the Paris Club may help a country achieve sound or strong practices (since the Paris Club periodically conducts data reconciliations), but more regular actions are necessary to secure such an assessment.

2.1.3 Contractual clauses
Contractual clauses imposing confidentiality can cause problems for the efficient allocation of capital. Both creditors and borrowers can face problems in evaluating and assessing loans in the absence of comprehensive information. Transparent and publicly available contractual information would over time result in more favorable financing terms for borrowers.
ST: The creditor uses publicly available templates for financing agreements and refrains from confidentiality clauses. SD: The creditor refrains from using confidentiality clauses with respect to information sharing with the IMF and the World Bank and the inclusion of a loan in aggregate public debt statistics. Rfl: The creditor uses comprehensive confidentiality clauses.
METHODOLOGICAL NOTES A confidentiality clause specifies information that cannot be disclosed by the borrower. Such clauses may simply protect trade secrets (i.e., commercially sensitive information) but can take on more blanket forms. Creditors should avoid clauses that prevent borrowers from reporting details on the amount and the terms of financing, as well as the use of proceeds, to the IMF and World Bank. Publicly available loan templates, required for a *strong* rating, are standardized loan contracts which are publicly disclosed, e.g., on lending agencies' web sites, and provide details of the standard terms and conditions of different agencies.[1]

[1]An example of such a standard publicly available template can be found on USAIDs web site, at: https://www.federalregister.gov/documents/2016/09/22/2016-22856/usaid-sovereign-loan-guarantees-standard-terms-and-conditions

2.2 Encouraging borrowing countries to continue to enhance fiscal transparency and public debt management
The responsibility for enhancing fiscal transparency and strengthening public debt management rests primarily with the borrowing authorities. However, creditors can contribute by verifying that decisions by borrowing countries to contract new loans are taken in accordance with the country's legal frameworks and debt management requirements. In particular, the creditor could clarify that the operation is: (i) approved by the relevant authorities following a transparent decision-making process; and (ii) adequately accounted for in the country's debt statistics.
ST: The creditor, in addition to ensuring that the borrower meets its own legal requirements (and only proceeding if it does), verifies that lending operations are adequately disclosed ex-post in public debt statistics. SD: The creditor verifies that the lending operation is in adherence with the borrower's primary and secondary legislation and that the amount of financing appropriately reflects the value of the project. If this is not the case, the creditor does not proceed with the operation. Rfl: The creditor proceeds with lending operation without inquiring whether the lending operation is in adherence with the borrowing country's primary and secondary legislation and that the amount of financing appropriately reflects the value of the project.
METHODOLOGICAL NOTES There are several aspects to verifying that transactions are consistent with a country's legal framework. These include checking whether: the borrowing entity/individual has the authority to commit the country to a loan, the loan is consistent with any debt limit a country might have, and the country is following its stated procedures for contracting loans (including on disclosure). Verifications that legal requirements are met can be sought in writing from the authorities. An independent view, for instance from the legal advisors to the transaction, should also be sought if needed. Verifications of adequate disclosure can be assumed if the creditor has written procedures requiring such (e.g., requiring that an assurance of publication be obtained from the authorities).

2.3 Promoting disclosure of information on past restructurings
Comprehensive information on past debt restructurings is key to promoting a collaborative approach among creditors and facilitating a sound understanding of the implications of the debt restructurings. Such information is also important to ensure that borrower's debt data accurately reflects the terms of past restructurings.
2.3.1. Post-restructuring data reconciliation
ST: The creditor conducts a post-debt restructuring data reconciliation with the borrower, ensuring accurate reflection and public availability of changed terms and conditions in the official debt data. SD: The creditor conducts a post-debt restructuring data reconciliation with the borrower, ensuring accurate reflection of changed terms and conditions in the official debt data. RfI: The creditor does not undertake post debt restructuring data reconciliation with the borrower.
METHODOLOGICAL NOTES Data reconciliation involves data checks between the creditor and the borrower on loans and guarantees as defined in practice 2.1.2. As opposed to practice 2.1.2., this practice specifically evaluates data reconciliation exercises after debt restructuring was undertaken. Post-restructuring information could be disclosed in public reports; on creditor agencies' web sites; on the single government website; to IFIs and other fora; or in other ways.
2.3.2. Public disclosure of participation in debt restructuring
ST: The creditor publishes information about its participation in debt restructurings, and details on its contribution, including amounts and changes in terms. SD: The creditor makes public its participation in debt restructuring. RfI: The creditor does not make public its participation in debt restructuring.
METHODOLOGICAL NOTES Disclosure regarding the participation in debt restructuring could be made in public reports, on creditor agencies' web sites; on the single government website etc.

3. Consistency of Financial Support

3.1 Providing financing consistent with IMF/WB debt policies
The responsibility to adhere to the policies attached to the financing from the IMF/WB lies squarely with the borrowing member country. However, as shareholders in the IMF and the World Bank, official bilateral creditors should also on a best effort basis seek assurances with the appropriate borrowing country authorities that the new financing is consistent with the IMF's Debt Limit Policy (DLP) and of the International Development Association's Non-Concessional Borrowing Policy (NCBP), its Sustainable Development Finance Policy (SDFP) and its NPC. The IMF and the World Bank offer technical support to bilateral official borrowers and creditors in these efforts, notably, through the Lending-to-LICs mailing box.
ST: The creditor seeks, on a best effort basis, assurances with the appropriate borrowing country authorities that the new financing is consistent with the IMF's Debt Limits Policy (DLP), IDA's Non-Concessional Borrowing Policy (NCBP) and Sustainable Development Finance Policy (SDFP), and the World Bank's Negative Pledge Clause (NPC,), and clarifies any technical questions with the IMF and/or World Bank as needed. SD: The creditor seeks, on a best effort basis, assurances with the appropriate borrowing country authorities that the new financing is consistent with the IMF's DLP, IDA's NCBP and SDFP, and the World Bank's NPC. Rfl: The creditor does not seek on a best effort basis to ensure compliance with the IMF's DLP, IDA's NCBP and SDFP, and the World Bank's NPC when contemplating new financing operations.
METHODOLOGICAL NOTES The consistency of financing with the IMF and World Bank debt limits and NPC could be verified with the authorities directly; or be assumed by the direct involvement in the transaction of the Ministry of Finance of the borrower country. Examples of seeking clarifications from the IMF and/or the World Bank include interactions through the Lending-to-LICs mail boxes. For reference, creditors who use these tools provide information on future loans or on a loan agreement that has already been signed; inquire about whether loans would be considered concessional, or non-concessional; and inquire about any debt limits in place under a program (among other issues).

3.2 Committing to the long-term debt sustainability of borrowing countries – by facilitating smooth debt restructurings when needed
Debt restructurings—when necessary—should be carried out as swiftly and efficiently, with a treatment that would be consistent with restoring debt sustainability. A protracted process will further deteriorate the economic situation of the borrower, weaken its repayment capacity, and delay the restoration of macroeconomic viability. While an inadequate treatment—one that falls short of what is required to restore sustainability—will lead to future payment difficulties and the need for repeated restructurings. To this end, creditors should promptly engage with the borrower when a borrower seeks a consensual debt restructuring, and when appropriate, creditors should seek to collaborate with other creditors in good faith.
ST: The creditor has a debt restructuring framework in place, that is conducive to providing required relief in a timely fashion, and participating in a collaborative approach with other creditors, when appropriate. SD: The creditor has a debt restructuring framework in place. RfI: The creditor does not have a debt restructuring framework in place.
METHODOLOGICAL NOTES A country's debt restructuring framework should have several attributes including: a provisioning policy (or some equivalent way for a creditor government to provide resources to its own lenders who are affected by the restructuring); a policy about when and how to conduct a restructuring in government majority-controlled creditors; a mandate for their respective Boards to implement debt restructuring; a framework to coordinate its own lenders internally and to coordinate externally; and a framework to monitor on delivery of restructuring commitments by its lenders. Participating in a collaborative approach can be achieved via membership in existing international fora, i.e., the Paris Club; or having in place procedures for ad hoc coordination with other creditors (e.g., coordinating with the Paris Club on an ad hoc basis, or hiring advisors to facilitate coordination with other creditors).

3.3 Providing technical assistance on debt related issues
In the absence of adequate debt-related technical capacity, Governments may not be in a position to take informed decisions regarding appropriate borrowing options from a cost/risk perspective. The degree of sophistication in modern finance further increases the complexity of such decisions. These factors underscore the need for technical assistance (TA) to borrowing countries to narrow the information asymmetry between creditors and borrowers on various aspects of public debt management, financing options, and risk assessment.
ST: The creditor, when encountering insufficient understanding of the financing terms or capacity on the borrower's side, provides technical assistance in coordination with the WB and IMF or requests such from IFIs. SD: The creditor takes steps to ensure the borrower's understanding of the financing terms of the loan in every lending operation, including on associated costs and the risks. RfI: The creditor does not ensure the borrower's understanding of financing terms, including associated costs and risks.
METHODOLOGICAL NOTES Limited capacity on a borrower's side could be the result of an inadequately-resourced debt management function. The support of legal and financial advisors may help the borrower but is not necessarily a sign of adequate capacity. Steps to ensure borrower understanding could include procedures to allow adequate time for country authorities to review documentation, and procedures to jointly review documentation and legal, financial and economic risks, Country authorities must request TA from IFIs. IFI TA can be coordinated with bilateral TA efforts on request.

4. Coordination of Stakeholders

4.1 Conducting regular dialogue with stakeholders
A continuous dialogue among stakeholders can help enhance creditor coordination and help safeguard debt sustainability. There are numerous fora devoted to public debt. Creditors, borrowers and IFIs should take advantage of these events to address topics of mutual interest.
ST: The creditor, in addition to participating in regular dialogue with other stakeholders through international meetings on debt related issues, promotes discussions on specific methodological or operational issues where relevant. SD: The creditor participates in dialogue with other stakeholders through international meetings on debt related issues. RfI: The creditor does not engage in regular dialogue with other stakeholders.
METHODOLOGICAL NOTES Dialogue with other stakeholders includes events such as debt conferences (including those held by UNCTAD; the Paris Forum); IMF or World Bank seminars on debt issues; or other relevant meetings. Engagement by both economic oversight ministries and lending agencies should be considered. Methodological/operational issues could include emerging risks and how to address them, as well as developing methods, standards, and guidance for debt data management and reporting. Identifying these and asking for them to be put on the agenda of debt conferences would meet the *strong* categorization.

4.2 Facilitating dialogue among international financial institutions to promote coordinated policies
Inter-IFI cooperation is important to develop effective policies and foster strong practices, while avoiding duplication of efforts. Creditors, as members of the Executive Board at these institutions, have an important role in directing their activities, and can encourage the strengthening of collaborations among the IFIs.
ST: The creditor takes steps to encourage interaction between the IMF, the World Bank, and other IFIs, and takes an active role in promoting coordination on debt related issues. SD: The creditor takes steps to encourage interaction between the IMF, the World Bank, and other IFIs. RfI: The creditor does not promote inter-agency coordination.
METHODOLOGICAL NOTES Assessing whether the creditor facilitates dialogue among international financial institutions to promote coordinated policies can include whether steps were taken to encourage interaction between the IMF, the World Bank, the regional development banks, and other financial development institutions. For instance, identifying issues for joint IFI work, and requesting information on synergies between new IFI policies. An active role could involve financially supporting joint IFI debt capacity development efforts (and participating in the oversight thereof).

5. Promoting of Contractual and Financial Innovation and Minimizing Litigation Issues to Strengthen Resilience

5.1 Continuing to work on financial innovation in lending and enhancing resilience to shocks
G-20 countries could help borrowing countries preserve debt sustainability in the face of natural disasters or other adverse shocks (both external and domestic) by promoting and facilitating the use of new instruments specifically designed to promote resilience.
ST: The creditor, in addition to supporting initiatives that explore and develop financing solutions to enhance resilience to shocks as a member of international fora, offers and promotes, when relevant, financial instruments that embed more resilience into the debt structure of the borrowing country. SD: The creditor, as a member of international fora, supports initiatives that explore and develop financing solutions enhancing resilience to shocks. Rfl: The creditor does not actively engage in exploring new innovative financing options.
METHODOLOGICAL NOTES Financial instruments that embed more resilience include (but are not limited to): debt instruments with extendible maturities, commodity price- or GDP-indexed contracts, and provision of insurance against climate change/pandemics. Supporting initiatives may involve undertaking or supporting research into instruments that enhance resilience, supporting efforts to develop model contracts/term sheets, and supporting/subsidizing regional initiatives to advance the use of such instruments.

5.2 Promoting enhanced contractual clauses in foreign-law sovereign bond issuances
The precise design of international bond contracts is a decision of the sovereign issuer, in consultation with its legal and financial advisers. However, enhanced contractual features can render the system much less vulnerable to delayed and drawn out restructurings, and minimize the risk of hold-outs and costly litigation. The IMF and the World Bank have endorsed such contractual features as a means to promote stability of the international financial system.
ST: The creditor, in addition to meeting sound practice, promotes enhanced contractual clauses (modified *pari passu* and enhanced collective action clauses) by providing or supporting coordinated technical assistance in this area. SD: The creditor includes enhanced contractual clauses (modified *pari passu* and enhanced collective action clauses) when it issues international sovereign bonds. RfI: The creditor does not actively engage in supporting enhanced contractual clauses.
METHODOLOGICAL NOTES In assessing the level of compliance, it is useful to explain the ways in which the update of new contractual clauses in sovereign bond issuances (modified *pari passu* and enhanced collective action clauses) have been implemented. Specific inclusion of such clauses in contracts support a *sound* rating. Promoting bilateral or IFI TA in debt management and financial market development can provide an opportunity for borrowing countries to learn about the enhanced features.

5.3 Addressing the challenges posed by some litigating creditors
Distressed debt investment funds have a role to play in resolving debt crisis, mainly, they can provide liquidity in secondary markets for sovereign bonds. However, a subset of these funds that buy distressed debt at a large discount with the intent to recover the full-face value through litigation has made restructurings extremely difficult. Thus, legislative efforts to curtail this type of investing could help and should aim to strike the right balance between further discouraging disruptive behavior and preserving secondary-market liquidity. Many developing countries also have limited technical capacity in addressing challenges with litigation. G20 members can also help addressing challenges by litigating creditors by providing technical support as needed to affected countries.
ST: The creditor, in addition to supporting initiatives to enhance monitoring of litigation by non-cooperative minority creditors and seeking appropriate ways to take action, provides or supports technical assistance to countries with limited capacity in addressing litigation challenges. SD: The creditor supports initiatives to enhance monitoring of litigation by non-cooperative minority creditors and seeks appropriate ways to take action. RfI: The creditor does not support initiatives to enhance monitoring of litigation by non-cooperative minority creditors and to seek appropriate ways to take action.
METHODOLOGICAL NOTES Monitoring and seeking appropriate ways to take action generally means having in place procedures to: observe the actions of non-cooperative litigating creditors and to come to a view about when their actions are disruptive; and to have tools available to assist the smooth implementation of the market-based approach to debt restructuring (e.g., methods to stay the execution of judgments when appropriate). In assessing these ratings, it would be useful to explain the ways in which the challenges posed by some litigating creditors were addressed. Specific identified actions in this area would support a *strong* rating.

7 List of Figures

8 List if Tables

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