

Introducing A Global Sectoral Framework for Socio-Economic Value Creation

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ABSTRACT

Global production has progressively highlighted its fragmented side within the Global Value Chains (GVCs). This paper introduces a Global Sectoral Framework (GSF) to enhance the identification, allocation, and governance of social investments across geographically dispersed activities. Even if investments have risen, a unified framework and an integrated digital system that allocates social investments is a path forward for a global alignment on the identified major social challenges. The research introduces a Global Sectoral Framework to improve social investment effectiveness through a digital system and an identificatory labelling method. Aligning priorities with sector-based value chains, the framework is built on three main pillars: (i) value chain and stakeholders' identification (ii) resources allocation (iii) governance. These three pillars are formalized into composite indices aggregated into social investment value effectiveness (SIVE) index. This study advances an applicative illustration within the space economy demonstrating the framework's capacity to evaluate the potential for socio-economic returns across high-value sectors. By enabling alignment between social investments and global networks, this study contributes to a resilient, inclusive, and effective economic system.

Keywords:

Global Value Chains

Social Investment

Governance

Public Value, ESG

Foreign Direct Investment

Public and Private Procurement

Global Sectoral Business Framework.

Business and public policy maintain a close and interdependent relationship. Within the scope of this research, the term “business” is understood in its broadest sense and refers to the set of governance management, coordination and decision-making processes under which public, private, and non-governmental organizations mobilize the required resources to create value across multiple sectoral value chains. This interpretation reflects business administration, whereby organizations operate in complex industrial and institutional environments. Furthermore, the definition involves as well as interactions among economic actors, public institutions, and stakeholders who influence organizational strategies, sectoral competitiveness, and achievement of national priorities, objectives. While public policy and business balance dimensions of economic and social action, shifts in market dynamics and structural constraints may generate tensions that challenge the status quo and the equilibrium sought by both public and private decision-makers.

This research pursues this perspective by examining the relationship between public policy and business through the lens of global value chains and as a sectoral analysis the space industry. To support such sectoral analysis, productive systems encompass all factors contributing to the production, transformation, and circulation of goods and services (CNES, 2026). The productive system is no longer a simple procedural exercise but rather a national strategic instrument that helps to draw the national industrial policy as it progressively evolved into a strategic decision-making position. It now enables policymakers and organizational leaders to identify sectoral goods, better understand value creation mechanisms, and effectively align policies with industrial strategies toward the most critical and growth-generating segments. While Global Value Chain has generated specialization, productivity, and access to international markets, it has also produced statistical inconsistencies and financial duplications. The existing valuation methods integrate national accounting, thematic accounts, and supply-use inputs-outputs table to capture the value created. Although current practices have enabled cross-countries analysis, for better decision making, yet a framework that links value creation to social investment and its outcomes is still missing in the traditional tools.

Building on this understanding, it becomes clear to examine the mechanisms through which economic and industrial dynamics are operationalized. In governance

systems, these mechanisms are structured through cross-border investment flows, integrated production networks, and value-chain-based configurations of industrial activity. Among these instruments, Foreign Direct Investment (FDI) occupies a key role, as it reflects the market-driven investment allocation processes and policy-induced strategic positioning by states that are seeking to prioritize their industrial base. It is there where the interaction between public policy and private sector takes place. Consequently, the interaction between public policy and business cannot be fully understood without considering how investments are made, and how production structures and socio-economic objectives are articulated within global value chains. Therefore, this study perspective provides an analytical foundation for examining the role of investment mechanisms as instruments of sectoral governance that simplifies relation between policy and business despite structural administrative burdens.

Although there is significant progress made to lower administrative burdens and improving measurement methodologies, gaps remain in how social investments are acceptably identified, strategically allocated, and genuinely governed to ensure socio-economic impacts. Existing industrial, environmental, and social governance policy frameworks are presented in a fragmented manner, rather than developing a single decision-making architecture capable of capturing cross-sectoral outcomes. In response to this limitation, this study introduces a Global Sectoral Framework (GSF) and its associated conceptual model, designed to align investment flows and national socio-economic objectives. This present research applies the framework to the space industry, as an empirical study, enabling the examination of complex socio-economic challenges through three analytical pillars. Accordingly, the identification pillar targets the Global Value Chains validity through commodity chain and stakeholders mapping methodologies. The allocation pillar reaffirms the alignment between investments and national strategic priorities, while the governance pillar assesses coherence of policy frameworks and implementation mechanisms.

Background of the study:

The space sector has long functioned as a critical infrastructure asset for our economies. Driven by ambition, scientific inspiration, and competition, the sector has delivered landmark successes while profoundly transforming national and regional industrial ecosystems. These achievements have positively brought national and

regional socio-economic spillovers, through contributions towards the Sustainable Development Goals (SDGs). Characterized by a dual value chain, commercial and defense, the sector operates at the strategic imperatives. This duality remains highly dependent on diverse funding sources. On the one hand, legacy programs that are primarily financed by the public sector; on the other hand, commercial initiatives that are financed by the private sector. Together, generating complex dynamics, in which decisions on funds allocation can influence the investments scale direction and their outcomes. Despite high-value revenue streams and promising scientific progress, the industry's socio-economic outcomes remain uneven. Businesses constituting public goods require identificatory label and a digital system to govern Sectoral socio-return. In this understanding this research identifies a problem: the absence of a framework, a digital system and an identificatory label for accounting social investments. With concern are these key problems (Pr) elaborated below.

Pr1: Complexity in investment identification process creates misalignment with social priorities.

The increasing complexity of investment identification processes generates a structural discordance with national social impact priorities. Social investments are generally intended to reflect a country's collective national efforts to address social issues. In this regard, it is the responsibility of local, national and global stakeholders in detecting the trilemma between social, environmental and governance priorities.

Public authorities, social partners and non-governmental organizations, private sector, identify public interest drawing on institutional experience, risk pooling method and continuous collective learning processes. However, investments with fragmented funding channels complicate accurateness of the available funds due to the multiple stakeholder involvement. The case of the space sector is particularly interesting, the global market reached approximately USD 613 billion in 2025 (Space Foundation, 2025), reflecting a hybrid structure of public-private investment. Despite the available funding opportunities, the investments channels and their traceability across specific commodities and communities across the value chain remain insufficiently captured. Moreover, the industry funding channels are fragmented by commercial investments, national space budgets, and overlapping regional programmes funds. Fragmentation

which justifies the need for an integrated framework, capable of capturing the socio-economic outcomes of space value chains in a coherent and systematic manner.

Pr2: The absence of a unified digital system increases unfair investment redistribution.

The absence of an investment allocation system contributes to inefficiencies in resource distribution and weakens alignment with national social priorities. Once the strategic priorities are defined by national and regional public authorities, institutional funding is channeled through multiple mechanisms, sometimes shaped under social protection umbrellas. In parallel, corporate social responsibility-related expenditures and investments are routed through distinctive financial circuits, often independent from public systems. And the non-profits are to be considered as they also mobilize resources from both public and private actors, financial institutions, often supported by fiscal incentives.

Although measuring the overall size of the philanthropic sector across countries remains a challenging task, its social and economic impact is substantial. As a matter of reference, in the United States, the non-profit sector accounted for approximately 5,5% of GDP, (US Bureau of Statistics, 2020). In France, total donation represented 5,9 billion euros from 2011 to 2021 (DGFip, 2024). Assessing the magnitude of these financial flows remains complex, particularly when disaggregating investments at the sectoral level. The need for a digitally enabled governance system that guarantees an alignment with public policy objectives is paramount.

Pr3: Governance fragmentation impacts decision making quality.

Social investments cannot bring an effective value if the governing guidelines are not robust enough. Governance and practical rules regarding social investments differ whether it originates from institutions or from corporate sector. Taxpayers on their side are informed about their rights, obligations, and fiscal incentives through national tax administration. In this idea, national or regional fiscal policy instruments sets a clear direction regarding tax deductions for any donation that are received or released, thus strengthening the investment behaviors. The European Commission's Social Economy Action Plan states that tax incentives constitute a key instrument for

supporting social economy. And such provisions are embedded in national income tax laws, codes, and legal frameworks (European Commission, 2021).

Importantly, the administration of these tax incentives is not solely managed by the central government tax authorities, however, subnational and local governments also play a significant role in ensuring that social needs are properly considered. It is the responsibility of the local government to as well wisely allocate the funds received either from the government or from regional programmes. Despite these institutional arrangements, unclear orientations reflected in national social strategies, Sustainable Development Goals, roadmaps, and corporate social responsibility requirements, can result in suboptimal decision-making and misallocation of resources.

In parallel, while climate change adaptation and resilience-building strategies have become major challenges and policy considerations since the adoption of the United Nations Framework Convention on Climate Change, the literature on these questions has expanded significantly (Pelling et al., 2024; Eriksen et al., 2021; Nalau et al., 2015; Olazabal et al., 2024; Amorim-Maia, 2025; Bazaz, 2024; Kirby, 2021). The space sector, through its new technologies, significantly contributes to climate data systems and infrastructures, thus engaging in a strategic position to support global objectives. However, only few studies focus on socio-economic impacts at the sectoral level. Hence, this study targets a fundamental approach to identify, allocate, and govern social investments, thereby introducing a Global Sectoral Framework to promote inclusive growth within complex ecosystems.

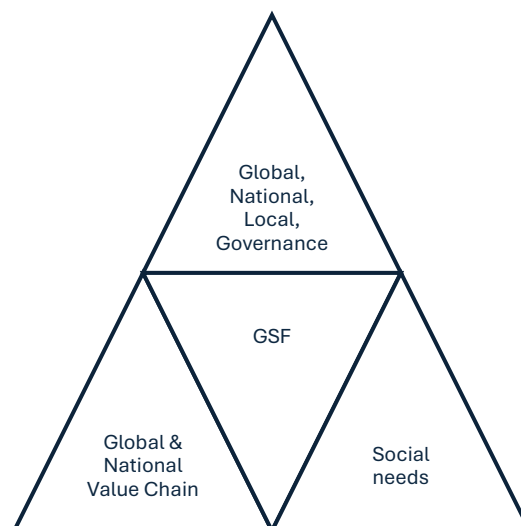
Significance of the study

The space economy is undergoing a technological and industrial transition toward what this study has conceptualized as Space Orbital Era. Evidenced through a proliferation of active satellites in multiple orbits, this transformation is particularly visible in the intensive utilization of Low Earth Orbit (LEO) and the Very Low Earth Orbits (VLEO) regimes. Historically, space-related activities have been examined through the technological, scientific, industrial, strategic spectrum. However, recent expansion of orbital activities raises concerns about its socio-environmental impact, market structure, and governance effectiveness.

The GSF integrates three primary sources of investment financing (public, private, and non-profits) while including a concept for: identification, allocation and governance of social investments aligned to the national and international priorities. At its core, GSF incorporates Global Value Chains analysis to highlight value creation process and its redistribution across space sector and beyond. Stakeholders connect public and industry requirements and monitor fiscal and social returns on investment. From a policy and governance perspective, this research contributes to the ongoing discussions concerning the effectiveness of investment in complex ecosystems. The framework delivers evidence-based decision-making tool architecture by facilitating a clearer understanding of how financial resources contribute to measurable socio-economic outcomes. Academically, this research contributes to the emerging body of literature on Space with a focus on its social impacts. Conceptually, the (GSF) offers good practices for institutions and corporations in orienting the right investment at the right time to the right priority social need at the right scale. Practically it introduces a decision tool for stakeholders to be transparent and conduct ethical use of their public funds.

Figure 1

Global Sectoral Framework diagram



Note. The above GSF Framework diagram presents the overarching components of the research concept. It expounds the integration of Global, National Governance,

and National commodity Value Chain, along with social needs to better identify, allocate and govern space social investments.

Statement of the problem

The absence of a validated, operational, and global framework to identify, allocate, and govern social investments constitutes a challenge for high-capital-intensity sectors such as the space industry. Fragmented activities and complex governance, constrain organizations to get alignment between financial resources and national societal priorities. Existing research provides limited guidance on how social investment can be identified, strategically allocated and effectively governed across sectoral value chains. To address this gap, this research introduces a Global Sectoral Framework (GSF) designed to support the alignment of social investments with public value creation and sustained socio-economic outcomes, with a particular focus on the space sector.

Research Questions

This research answers the following main question and sub-questions: How can a Global Sectoral Framework contribute to socio-economic value creation through the identification, allocation, and governance of social investments?

To answer this main question, three sub-questions will be studied: (i) how can social investments priorities be systematically identified within sectoral ecosystems? (ii) how can social investments be digitally allocated to maximize socio-economic value creation? (iii) how can effective governance mechanisms improve decision-making for sustained social investment? In sum, it is to operationalize the present framework through measurable constructs and indicators.

Propositions:

Based on the expressed research questions, following proposition guides this work:

(P1): The adoption of the GSF simplifies social investments identification process.

(P2): The adoption of GSF enables organizations to adopt an effective digital redistributive allocation system.

(P3): The adoption of GSF strengthens investments governance guidelines for decision making.

The Global Sectoral Framework is designed to integrate a cross-industry approach to adopt a global set of best practices into a comprehensible system and adaptable to any sector. This framework aims to (i) enhance investment identification process across regions, (ii) build an intelligent digital system for decision making (iii) support comparative socio-economic assessment analysis through an identificatory label.

2. Identification pillar: Mapping Value Chains and Stakeholders

2.1 Global Value Chain Identification

The Global Value Chain (GVC) framework examines production as sequence of value-adding activities distributed across geographies (World Bank, 2022). While Porter (1985) defined value chain through firm level, the Global Value chain expands its contributions to a global production network. The value chain is characterized by national and cross-border production chains with its manufacturing linkages. In this setting, Gereffi, Humphrey and Sturgeon (2005) expanded the understanding to a version of the global production system shaped by governance structures, inter-firm coordination and transaction costs. The authors highlight that creating value does not only depend on production efficiency but also on institutional governance reflected by its coordination level. However, academic contributions to integrate social investment dimensions within the Global Value Chains remain limited, particularly those arising from both public and private funding mechanisms.

Literature evokes that participation in GVC modifies developmental factors that include infrastructure quality, development of international financial architecture and systems, labor skills, institutional capacity, and technological development. Studies bring positive link between GVC integration and sustainable development outcomes, however persistent challenges are notable such as unequal value distribution, lower participation level of small and medium enterprises (SME), and the inclusion of social investments in the foreign direct investment mechanisms. Adding to this assessment, literature insufficiently connects value chain with national social priorities. By echoing

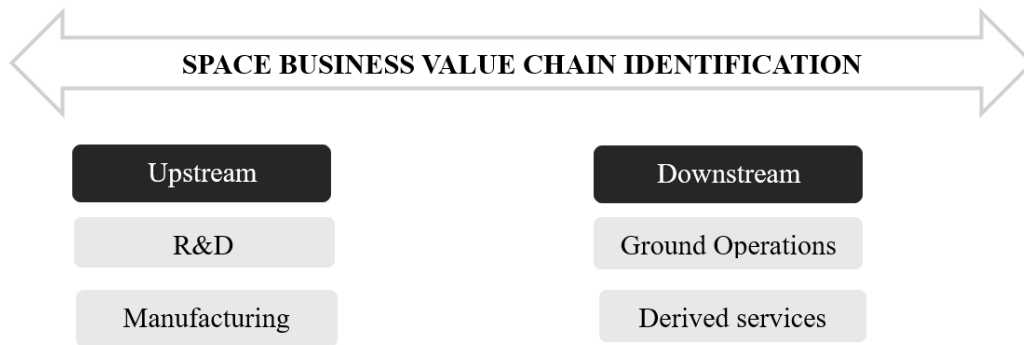
Porter (1985) here, it is to understand the connection between value-adding activities and its impact on the firm's value chain competitiveness. In a global perspective, the identification process of value-adding activities is sequenced. First, it connects the sectoral linkage to domestic and foreign Value-adding activities. Second, it traces the GVC level of input received, in other terms, a return on investment within the sector.

Sectoral linkages are characterized by identifying upstream and downstream activities. As a result, institutions and firms can better plan their national priorities. Despite positive impacts of sectoral linkages identification process on the planning strategy, the interdependency of activities among industries complexifies production networks per se (European Central Bank, 2017). Hence, a multi-sectoral linkages strategy help organizations to maintain spillovers. As an illustration, the Oil & Gas Industry Sector external uncertainties have recently impacted multiple areas of our economy at once, affecting the overall GDP. At the same criticality level, the space industry constitutes one of the main backbones of critical infrastructure, supporting Information, communication and telecommunications (ICTs), navigation, positioning, logistics, transaction timing, and strategic defense systems. Consequently, any direct or indirect disruption of orbital infrastructure, ground assets, could trigger systemic consequences far beyond the aerospace sector, disturbing the overall operational continuity and resilience of national critical economic architecture and systems.

To identify the space sector's position within the global value chain, and to determine the value-creation activities across international networks, the value chain identification process takes into consideration two key elements: upstream activities, downstream activities. As an illustration, the following figure presents a high-level component of the space sector based on the widely accepted representation of the industry's value chain.

Figure 2

Space Business General Value Chain



Note. The above figure represents the most globally validated space economy value chain. Upstream activities are engaged in research and development, launches, satellites manufacturing, among others. Whereas the downstream is comprised of companies that are specialized in ground operations activities and derived services: broadcast, navigation applications, insurance, combined use digital technologies, and space-based technologies. Building on this definition, the following model improves the traceability of value flows and investment segmentation.

$$GVCI = \frac{UP + MP + DS + TI}{FD} \quad (eq. 1)$$

Table 1

Global Value Chain Identification Equation Model Description Table

<i>UP</i>	Upstream production activities
<i>MP</i>	Midstream production activities
<i>DS</i>	Downstream activities
<i>TI</i>	Trade integration intensity
<i>FD</i>	Foreign dependency coefficient

Note. The sectoral value chain identified with its linkages will help illustrate strong production stages, better traceability of value flows, improved identification of investments segments.

Now that the sectoral general value chain activities are identified, the national and regional commodity chains value processes are required to evaluate, mitigate and govern potential risks within the overall supply chain nodes.

2.3 National and Regional Commodity Value Chains

The identification of National and regional commodity chains requires a coordinated analytical method. First, it involves characterizing domestic production systems capabilities to capture the value creation activities. Second it is to identify any emerging market segments and domains that disrupt existing structures. Third, it fits tracing sector-specific supply chain networks including its operations. Historically, the GVC emerged with the French “*filière* concept” and the commodity chain concept developed under the world-systems theory (Hopkins and Wallerstein’s, 1996). In fact, the “*Filière*” concept was designed to identify production and distribution systems in local economies, and to promote sectoral commodity organization up to their national borders (Fabe, Grote, Winter, 2009). For organizations that are not part of the Global Value chain, national perspective remains essential as the commodity chain analysis focuses on tracing back the set of inputs into each of the production processes.

Building on this dimension, Gereffi and Korzeniewicz (1994) conceptualized commodity chains as inter-organizational cluster around a single commodity or product. A network, geographically dispersed, locally integrated, politico-socially constructed, and statistically classified. To illustrate, authors emphasized that Global Commodity Chain (GCC) analysis measures input-output flows across various stages of a product’s life cycle. GCC also seeks to gauge social relationships and power dynamics among the actors involved within the value chains. For sectors with limited international exposure and integration within GVC, mapping the national commodity chains is essential for aligning production systems, financial channels, and policy support. Such analysis is supported by the World Input-Output Database (WIOD), the thematic satellite accounts and the harmonized sector-based codification which enhance visibility and domestic value creation in support of more informed decision-making.

More broadly, the literature shows that early identification process of the value chain and its supply chain value per segment could play a critical role in the regional thematic account. For instance, Europe alongside the United States of America developed the European space economy statistical thematic account (Eurostat, 2023) to better identify the commodity value chains. As stated by Megginson (2026), Zitelmann (2025), firms and institutional agencies are recommended to update their supply chain networks, to anticipate sectoral procurement and supply risks, which

could directly impact the commodity value chain architecture. Complexity to manage supply chain performance across the chains remains existing (Comune and Engel, 2026). The following model presents the Commodity supply value chain identification process of the space economy with its components.

$$DRV AI_s = \sum_{i=1}^n \left[\frac{(DV A_i + RV A_i) \times SC_i}{FI_i + EI_i} \right] \quad (eq.2)$$

Table 2

Commodity Value Chains Equation Model Description Table

$DRV AI_s$	Domestic and Regional Value-Added Identification Index for sector s
$DV A_i$	Domestic Value Added generated by activity i
$RV A_i$	Regional Value Added generated through intra-regional transactions
$SC A_i$	Supply Chain localization Coefficient (Share of locally sourced intermediate inputs)
FI_i	Foreign Input Dependency
EI_i	External Import Intensity
n	Number of production stages or activities within the commodity chain

Note. To evaluate the domestic and regional Value-Added Identification process for a given sector such as the space industry, the above model integrates domestic and regional value-added inputs through intra-regional goods and services transactions. It also includes the Supply Chain location coefficient based on the procurement good practices of an organization. To be more specific, the Foreign Input Dependency and the analysis of the External Import Intensity also play a clear role in the national and regional value creation activities. Hence, further, the identification of stakeholders will be required to evaluate and mitigate any potential risk within the overall supply chain nodes.

2.4 Stakeholder Identification

Stakeholder theory has remained relevant across the industrial revolution's transitions. Freeman (1988) initiated fundamental principles of stakeholder theory. In addition, Clarkson (1994), Donaldson and Preston (1995), Eden and Ackermann (1998) among others, argued that stakeholders should be understood primarily as individuals or groups who possess the power to directly influence the organization's

future. In contrast, Nutt and Backoff (1992) advocated that a larger set of groups or organizations should be considered. This study is built upon classical foundations of value chain. Clarkson (1994) Donaldson and Preston (1995), defined stakeholders as “any group or individual who can affect or is affected by organization’s objectives”. The definition remains foundational, but it does not include stakeholders’ impact in the organization value creation process. Hence, this research proposes an extended definition which emphasizes on the multi-sector contribution: stakeholders are, “any group and or individual who directly participates in the socio-economic value creation of an organization within a given sectoral value chain”. This revised definition enables an operational integration of the stakeholder theory within the GVCs, thereby proving that the identification, allocation and the governance of social investments process is necessary across multiple sectors such as the space sector.

Stakeholders’ identification process, particularly when initiated through social investment lens, provides critical insights on funding mechanisms and at the same it shapes stakeholder interactions, incentive structures, and coordination processes. Far from being a classificatory exercise, stakeholder mapping constitutes a strategic tool. By systematically identifying stakeholders, any organization can strengthen the design of social investment initiatives that better align with their national incentives mechanisms across the public institutions, private sector, financial institutions, and civil society organizations. The following equation model reflects the stakeholder’s influence on the organization’s objectives.

$$SIA = \sum_{k=1}^m [(SP_k + RI_k + CI_k) \times EI_k] \quad (eq3)$$

Table 3

Stakeholders Identification Equation Model

SP_k	Stakeholder participation level
RI_k	Resource influence capacity
CI_k	Collaboration intensity
EI_k	Engagement impact coefficient

Note. The model considers stakeholders participation level, their resource influence capacity, and their collaboration intensity to determine the engagement impact coefficient.

3. Allocation Pillar: Redistributive Investment Systems

3.1 Social/Societal Investments and National Priorities Alignment (SINPA)

Effective social investment requires alignment with the national priorities that are predefined. There is an increasing demand for funding to be aligned with social and societal challenges. On the one hand, public sector conducts structural reforms, and on the other hand private sector and non-profit sector share their responsibilities with public sector to address socio-environmental and policy challenges. However, instruments to measure investments effectiveness are inexistant due to the diverse methodologies and the absence of an integrated framework.

Social protection systems illustrate this fragmentation as they play a central role for individual well-being. These systems are one way among many to translate and operationalize social priorities (European Pillar of Social Rights, 2017). Achieving social and societal priorities requires coordination mechanisms that extend beyond national borders, including multi-actor organizational ecosystems. Notwithstanding that some strategic financial and operational responsibilities are traditionally assumed by states, which have been progressively and evenly distributed across stakeholders to share cost and risks. Such dynamics underscores the necessity for a Global Value Chains framework allowing a more impactful social investment outcome.

Despite the public, private and third sector critical role in restoring stability and trust through long-term growth, social investments face significant fiscal constraints. Global social spending is projected to reach 6.75% of GDP by 2050, with a visible cross-country variation driven by ageing population and fiscal pressure (IMF, 2026). At the same time, according to the International Labour Organization (2024), more than 55% of the world's population lacks any form of social protection, increasing exposure to economic shocks, health crises, and poverty cycles.

The challenge is therefore not limited to the availability of financial resources but also concerns the alignment between national and subnational municipal levels. Misalignments between these authoritative layers weakens policy effectiveness and reduces or even hinders the expected socio-economic outcomes. In response, this research positions national social priorities identification as the first condition for an effective redistributive investment. The objective is to gauge the degree to which social investments are aligned with the following: national development priorities, regional priorities, industrial strategies and societal needs.

$$SINPA = \sum_{i=1}^n \left[\frac{(NP_i \times SP_i \times IA_i)}{DP_i + MP_i} \right] \quad (eq4)$$

Table 3

Social Investments and National Priorities Equation Model Description Table

NP_i	National priority relevance
SP_i	Social priority significance
IA_i	Investment alignment coefficient
DP_i	Policy duplication factor
MP_i	Misalignment pressure

Note. The above model demonstrates that relationship can be operationalized through an index-based approach, where a higher SINPA score reflects stronger coherence between investment flows and national priorities.

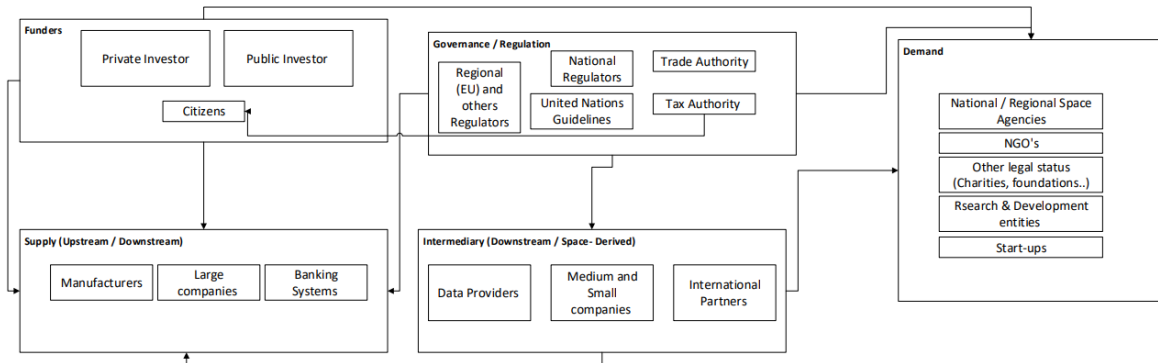
3.2. Sector-Based Value Flow Allocation (SBVFA)

If social challenges are taken as part of an equal determinant of human well-being, then policy makers will have to rely on relevant inputs for their decision-making processes. Effective response to climate change and socio-economic challenges mostly depending on access to high-quality and real-time data and the purposeful use of frontier technologies whether from a public or private perspective. Traditional accounting systems can certainly identify where economic value is created, yet they remain limited in their ability to trace the investments redistributive flow to address social priorities.

In this understanding, this research study advanced value-flow perspective to address these limitations. In fact, by tracing how financial resources are circulating across sectors, and how these funding flows contribute to public value creation. As a strategic and operational response, this framework offers a more dynamic concept of social investment. Contributions to the theory of value from Smith (1776) and Ricardo (1817) focused primarily on labor and production. Recent scholars have brought a modern point of view. In this spirit, Wulfert, Woroch, and Gero (2024) describe value networks as a catalyzer to business models, while Mazzucato (2018) compares value creation and value extraction in our modern economies.

Figure 3

Sector-base funding (monetary) value Flow Supply and Demand Table



Note. The above figure presents the space sector macro view of the funding supply and demand table.

The distinction between funding value flow supply and demand is critical, as investments must not only support productive activity but also strengthen resilience, innovation, and collective welfare. Sector-based value-flow mapping plays a pivotal role in this regard, as it enables policy makers and organizations to identify where investments outcomes are generated and where redistributive correction is required. Empirical sectoral evidence shows that downstream activities capture a significant share of total value added. This highlights that value creation extends beyond initial production, continuing towards the final integration by end-users. Thus, building a robust local output requires attention while building regional output within the value chain. The Objective of the following model is to evaluate how financial and socio-economic resources circulate across strategic activities.

$$SBVFA = \sum_{j=1}^m \left[\frac{(VF_j \times RC_j \times SA_j)}{LV_j + CF_j} \right] \quad (eq5)$$

Table 4

Sector-Based Value Flow Allocation (SBVFA)

VF_j	Sectoral value flow intensity
RC_j	Resource circulation coefficient
SA_j	Strategic allocation ratio

LV_j	Leakage of value
CF_j	Coordination failures

Note. This construct model operationalizes value-flow tracing, redistribution intensity, productive spillover effects, and sectoral resource circulation. A high SBVFA score indicates efficient sectoral redistribution, lower resource leakage, stronger productive circulation, and an improved investment targeting.

3.3 Funding Mechanisms

Since 1980, extreme weather events have generated a cost of US\$2.8 trillion in direct and indirect losses (Newman and Noy, 2023). Increasing vulnerabilities and induced national financial expenses, extreme weather events have direct effects on domestic livelihoods. It also exposes countries' structural weaknesses in maintaining their adaptation and resilience measures. In response to force majeure situations and negative externalities, solidarity-based funding mechanisms and the use of space-based data become essential for ensuring long-term economic stability.

The diversity of financial mechanisms reflects growing investor interest in addressing the most pressing social issues. In fact, the European Social Taxonomy Report (2022) affirms that there is a rising demand for social bonds to finance the most pressing challenges, and that the investors see social investments not merely as expenditure but as opportunities for financial and social returns. According to the interests expressed, instruments such as Social Impact Bonds (SIBs) have gained prominence as groundbreaking tools for tackling complex societal issues. Scholars such as Joy and Shields (2013), McHugh (2013) and Dowling (2016) suggest that Social Investment Bonds enhances the ability of governments to lead from distance through a focus on managing social risks, albeit creating self-sustained solidarity. While Edmiston and Nicholls (2017) put forward that the introduction of private sector logics through outcomes and performance-based principles has brought attention of scholars in social policy research. But no study has yet proven whether Social Impact Bonds can be effective in the case of sectoral investments.

Following the New Public Management era, the effectiveness of public reforms must consider the new types of financial mechanisms to foresee the traditional and emerging societal issues. According to Gereffi (1994), value capture is conditioned by

three key factors: the complexity of transactions, the degree of system codification, and the capabilities of suppliers to meet buyers' requirements. These conditions are applied in high-technology and complex manufacturing sectors, where disparities in costs, knowledge, and local capabilities constrain both economic returns and social outcomes. The Objective of the following model is to evaluate the capacity of funding instruments to distribute resources effectively, support investment scalability, reduce financing fragmentation, and ensure accessibility.

$$FMAC = \sum_{k=1}^p \left[\frac{(FD_k \times AC_k \times DI_k)}{TC_k + RF_k} \right] \quad (eq6)$$

Table 5

Funding mechanism identification equation model description table.

FD_k	Funding diversity
AC_k	Accessibility coefficient
DI_k	Distribution intensity
TC_k	Transaction costs
RF_k	Regulatory friction

Note. The above model highlights that higher funding mechanisms score reflects a diversified funding ecosystem, stronger access to capital, smoother distribution channels, and lower institutional barriers.

$$SIAC = \alpha(SINPA) + \beta(SBVFA) + \gamma(FMAC) \quad (eq7)$$

Table 6

Governance Clarity, ESG Convergence, and Procurement practices Equation Model

$SINPA$	National Priority Alignment
$SBVFA$	Sector-Based Value Flow Allocation
$FMAC$	Funding Mechanisms Allocation Capability
TC_k	Transaction costs
α, β, γ	Weight coefficients

Note. The above formula integrates each construct from the funding allocation identification process through a unified composite Social Investment Allocation

Capability Index SIAC, where higher rate reflects a better identification capability to improve allocation effectiveness.

Governance Pillar: Rules, Measurement, and International Coordination

4.1 Governance Clarity, ESG Convergence, and Procurement practices

This research study examines national and regional governance models that promote social investment priorities and practical implementations at the domestic and international levels. The World Bank defines governance as “the exercise of political authority and the use of resources to manage society’s problems” (World Bank, 1991). The fragmented financial instruments for institutional and corporate social investments raise a key question: can a unified Global Sectoral framework improve investments decision-making processes?

Governance complexity has increased for all types of organization. Within the private sector, companies must navigate through a wide range of ESG requirements, and evolving technological and regulatory standards, all of which influence internal operations and productivity. In this regard, this study argues that, rather than pointing financial and regulatory mechanisms separately, a single structured instrument widely applicable, globally accepted, can be implemented. In addition, this study fosters the interest of technologies and local repository systems to enhance transparency and decision-making. Ultimately, it argues about the importance of preventive public and private governance at a national and regional level, to improve predictable long-term impact.

$$GCEPP = \sum_{i=1}^n \left[\frac{(GC_i \times ESG_i \times PPI_i \times IC_i)}{RF_i + GF_i} \right] \text{ (eq8)}$$

Table 7

Governance Clarity, ESG Convergence, and Procurement practices Equation Model

GC_i	Governance clarity coefficient
ESG_i	ESG convergence intensity
PPI_i	Procurement policy integration
IC_i	Institutional coordination
RF_i	Regulatory fragmentation

GF_i	Governance friction
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Note. The objective is to evaluate if governance rules are coherent, if ESG frameworks are integrated, and if procurement systems reinforce socio-economic objectives, and finally if the institutional actors' coordination is efficient. The model reflects that a high GCEPP score indicates stronger institutional coherence, better ESG-policy adoption, a better procurement system aligned with social objectives, and clearer governance accountability and transparency.

4.2 Measurement Strength Capability (MSC)

Social productivity measurement systems are essential. In several investment instruments, such Social Impact Bonds (SIB's), service deliverers, undertaking social programs would receive their capital from private investors. The investors are paid in return by the public organization only if the degree of social impact is achieved. This is one way of measuring the investment tenure.

However, the concept of Social Return on investment (SROI) promotes early engagement at the program design stage to determine appropriate metrics and to assess both monetized and non-monetized returns. Given the increasing pressure on private and third-sector organizations to achieve the key performance indicators that differ across the industries through multiple frameworks. Public authorities and rating agencies must periodically revise their instruments confirmability. And make sure that stakeholders have the necessary leverage to achieve the requirements.

Scholars such Baffo, Leonardi, Alberti and Petrillo, (2024) identified six metrics in the evaluation of public investments: economic efficiency, sustainable development and social equity, risks management, ethical compliance, and informed stakeholders for better political decision-making. In addition, authors proposed criteria aligning with the established (ESG) standards. The objective is to measure if organizations have the capability to monitor outcomes, compare impacts, harmonize indicators, and support evidence-based decision-making.

$$MSC = \sum_{j=1}^m \left[\frac{(DI_j \times EV_j \times CI_j)}{MI_j + DA_j} \right] \quad (eq9)$$

Table 8

Measurement Strength Capability Equation Model description table (MSC)

DI_j	Data integration capability
EV_j	Evaluation robustness
CI_j	Comparative indicators harmonization
MI_j	Measurement inconsistency
DA_j	Data ambiguity

Note. The above model reflects that a high MSC score shows a stronger monitoring system, reliable socio-economic indicators, reduced data fragmentation, and higher comparability across organizations and regions

4.3 International Collaboration

With the proliferation of fast-growing number of organizations that supply and demand funds. Global cooperation is essential for effective and guided strategies on where the social and societal priorities reside. Indeed, Global production systems, Foreign Direct Investment (FDIs), and the interplay between regional and national regulatory requirements and social priorities have rendered investment decisions and brought a structural and operational coherence. Scholars have studied how early policy coordination strengthens member-states capacity to achieve social outcomes (De la Porte and Palier, 2022). And how international social investments strategies can leverage the firm's foreign direct investment attainment. Beyond classical trade theories (Mundell, 1957), substantial share of global capital flows is driven by intra-firm activities (Markusen and Venables, 1996; Navaretti, 2020).

Therefore, with this sectoral perspective, the entry of the Artemis Accords in 2020, reinforcing commitment by signatory nations (67) to the peaceful use of Outer Space, opened the next generation of possibilities to space exploration. Fueling new industries and technologies, supporting employment with highly skilled workforce, the program socio-economic output is significant at a national and international level. If International partnership in space drives innovation, it also impulse highly competitive environment between countries and space agencies (Sawik, 2023). Collaboration as well reduces the costs of access to space in several markets such as the small and autonomous constellation of satellites and space objects. If the Commercial activities reveal opportunities for joint missions and shared infrastructure, it has also been the case for the defense activities. In addition to international cooperation, guaranteeing

equitable use of space resources and safeguarding the peaceful use of celestial bodies is essential.

Moreover, from a global perspective, international collaboration should also include socio-economic measurement incentives rather than focusing on capital mobility. Stronger national, regional and international relations can consequently be fostered when investment instruments actively reward measurable public value creation. The objective of the following model is to evaluate the extent to which international partnerships, foreign direct investments, cross-border governance systems, and multilateral coordination, supports socio-economic value creation.

$$ICC = \sum_{K=1}^p \left[\frac{(IP_k \times FDI_k \times TC_k \times KS_k)}{DP_k + CD_k} \right] (eq10)$$

Table 9

International Collaboration Equation Model description table

IP_k	International partnership intensity
FDI_k	Foreign direct investment contribution
TC_k	Technology, capability transfer
KS_k	Knowledge-sharing coefficient
DP_k	Dependency pressure
CD_k	Coordination divergence

Note. The following equation model reflects that a high international collaboration score can indicate effective international cooperation, stronger capability transfers, productive investment partnerships, and improved global governance

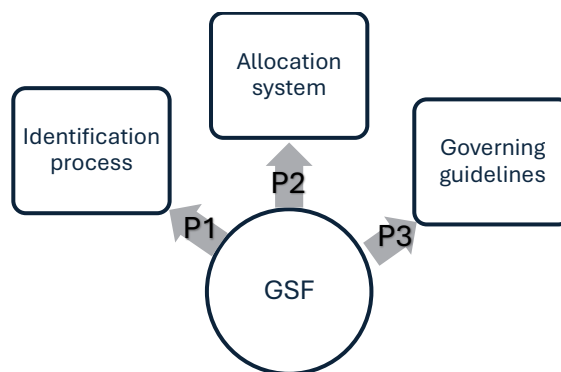
5. Conceptual Model, and framework development Methodology

This research adopts a sequential mixed-method research design combining conceptual framework development and the secondary data analysis along with an in-depth empirical stakeholder validation. As a three-step process: First, a systematic review of the literature is conducted to identify the theoretical foundation of the pre-identified themes. Second, secondary data sources are analyzed to operationalize the framework constructs and assess their applicability within sectoral ecosystems. Third, primary data collection through surveys and key-informant interviews where

feasible, to obtain stakeholder perspectives regarding the framework’s relevance, applicability, and implementation challenges. The integration of these complementary sources of information provides a triangulated analysis of the collected data, hence strengthening the research findings.

Figure 3

Global Sectoral Framework Pillars diagram



Note. The diagram exposes the three pillars of the Global Sectoral Framework

This study introduces a framework grounded in integrative theory-building and multi-pillar synthesis. Drawing on the established GVC research and composite index construction, this framework was developed through a systematic, iterative process that combines deductive theoretical integration with inductive insights from sectoral analysis. The research adopts a pragmatic identification of the composites indices, specifically the Identification Capability Index (IIC), Social Investment Allocation Capability Index (SIAC), Social Investment Governance Capability Index (SIGC), and the overarching Socio-Investment Effectiveness (SIVE). The following four steps are applied to this research methodology design.

Step 1: Conceptualization and Indicator Selection

Sub-dimensions and indicators were derived deductively from the core literature foundations, including GVC governance theory (Gereffi, 2014), stakeholder theory (Freeman, 1988; Clarkson, 1995), public value theory and ESG integration

literature. Key constructs, such as upstream, midstream, and downstream activities for GVC identification, alignment coefficients for national priorities, and governance clarity measures were identified and refined according to sectoral examples. In this stance, the space economy provided critical insights due to its systemic externalities and strategic importance.

Step 2: Operationalization

Each framework pillar was formalized through a composite measurement model consisting of observable indicators, normalized metrics, and aggregation procedures. The resulting indices provide a structured method to transform diverse sectoral information into a comparable and relevant measures of identification capability, investment allocation capability, governance capability, and socio-economic investment effectiveness. Variables were designed to accommodate multi-source inputs, which combine quantitative metrics such as value-added shares from the World Input-Output Database, trade integration through supply-use tables.

Step 3: Weighting and Aggregation

A hybrid weighting scheme was employed, using equal weighting as the baseline specification, supplemented by sensitivity-tested alternatives such as Analytical Hierarchy Process, where empirical datasets permit. Aggregation follows additive composite index construction principles. Equal weighting serves as the basis for a critical evaluation to avoid subjective prioritization of investments. Alternative weighting schemes, including expert-driven weighting approaches depending on the countries and organization's preferences at a given time, are also to be considered in the future work.

Step 4: Sectoral Application and illustration

The space industry serves as a critical case study example, given its highly globalized value chains, strong public-private interactions, and its foundational role to enable essential infrastructure for telecommunications, energy synchronization, navigation, logistics, and defense systems. Value chain mapping draws on validated upstream/downstream distinctions from international space economy reports (OECD, ESA, Space Foundation). This framework demonstrates its diagnostic capacity and

provides an illustration of Socio-Investment Value Effectiveness (SIVE) in a high-externality strategic sector.

$$SIVE = f(IIC, SIAC, SIGC) \text{ (eq10)}$$

Step 5: Framework Evaluation and validation strategy

Three complementary mechanisms. First, construct consistency was assessed through alignment with established theoretical foundations through a systematic literature review. Second, indicator applicability was assessed through secondary sectoral datasets. Third, stakeholder feedback through surveys and key informant interviews were collected, to assess perceived relevance and its implementation feasibility. Together, these procedures provide an initial validity of the framework, while establishing directions for future empirical validation. Future empirical validation may be conducted with a larger multi-sectoral dataset through statistical techniques such as Exploratory Factor Analysis, Confirmatory Factor Analysis, and Structural Equation Modelling.

Conclusion:

By introducing a unified and an integrated Sectoral framework, this research study demonstrates the importance of ensuring long-term investments governance.

The Global Value Chain dimension of this paper highlights the necessity of a sectoral framework to identify, allocate and govern social investments in a coherent manner. Second, it acknowledged the heterogeneity of measurement practices and the diverse social investments instruments. In response, the identification pillar maps the interconnections between value chain components and identified stakeholders through multi-level commodity chain analysis. The allocation pillar directs resources according to national priorities and through a unified financial mechanism. Finally, the Governance pillar ensures clarity, measurement robustness, and capacity to assess socio-economic outcomes via harmonized, internationally validated metrics reflecting the maturity of national, regional, and global coordination.

By integrating Global Value Chain analysis with stakeholder theory, this study argues that the identification process alone remains insufficient if not applied a multi-level analysis of the commodity value chains for each industry. Similarly, investment allocation process alone is insufficient if not applying a national governance structure

that enables all parties to capture both monetary and non-monetary returns. A central contribution of this framework lies in its novel perspective on how an integrated digital system will allow stakeholders to monitor, trace, and optimize their social investments in real time by reducing information asymmetries and increasing accountability within complex production networks.

The empirical illustration in the space sector is a canonical case study of high-externality and a strategic infrastructure sector. Strong capabilities in value chains coexist with governance misalignment that constrain downstream spillovers and resilience. These findings extend the GSF governance literature by endogenizing social investment as a mechanism for mitigating risks and coordination failures such as value leakage between activities. For public economics, they can offer actionable insights for designing incentive-compatible policies that could align with private innovation and collective welfare expectations.

Future research should pursue structural estimation of the Socio-Investment Value Effectiveness (SIVE) model using panel data on public investments and socio-economic outcomes, along with comparative applications across strategic sectors. Ultimately, this study posits that in a fragmented global production system, returns to social investment are not additive but multiplicative contingent upon deep alignment with value chain structures and institutional architectures. Realizing this potential will require moving beyond siloed and approaches toward an ad-hoc structured, harmonized frameworks such proposed in this research study.

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