

INSTITUTIONAL CAPITAL THEORY

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THE HIDDEN SOURCE OF STATE PERFORMANCE

Institutions are not only rules. They are also capital.



WHAT WE SEE

Measurable. Observable.
Common across countries.



Laws
Policies
Governance Scores
Institutions on Paper
Public Services
Tax Collection

**SAME ON THE SURFACE.
DIFFERENT UNDER THE SURFACE.**



WHAT WE DON'T SEE

Unobservable directly.
Built over time.
Hard to copy.
Erodes silently.



INSTITUTIONAL CAPITAL STOCK

Durable institutional capabilities that generate public value year after year



Foundational Systems
(ID, registries, data)



Digital Infrastructure
(interoperable platforms, payment rails)



Legal & Regulatory Capacity
(enforcement, adjudication)



Human Capital
(skills, expertise, public service ethos)



Trust & Legitimacy
(citizen confidence, social licence)



Organisational Routines
(processes, SOPs, coordination)



Operational Capacity
(implementation, last-mile delivery)



Maintenance & Adaptation
(upgrades, cybersecurity, resilience)



Interoperability & Networks
(systems that work together)



Institutional Memory
(data, learning, track record)



COUNTRY A

High Institutional Capital



- ✓ Strong tax collection
- ✓ Effective public services
- ✓ Higher productivity
- ✓ Lower sovereign risk
- ✓ Lower borrowing costs
- ✓ Greater resilience
- ✓ Stronger development outcomes



COUNTRY B

Low Institutional Capital



- ✗ Weak tax collection
- ✗ Poor service delivery
- ✗ Lower productivity
- ✗ Higher sovereign risk
- ✗ Higher borrowing costs
- ✗ Lower resilience
- ✗ Weaker development outcomes

BUILT THROUGH INVESTMENT | ACCUMULATED OVER TIME | SUBJECT TO DEPRECIATION



**OUTCOMES ARE NOT DETERMINED BY SPENDING, LAWS OR GOVERNANCE ALONE.
THEY ARE DETERMINED BY THE SERVICES GENERATED BY INSTITUTIONAL CAPITAL.**

Invest in it. Build it. Maintain it. Use it well. Measure it. That is how states deliver.

Abstract

This paper develops Institutional Capital Theory, a framework for analysing a bounded class of durable institutional capabilities as productive capital. From four axioms — that capital yields a flow of productive services, that institutional capabilities differ in durability, that expenditure becomes capability only under identifiable conditions, and that the service yield of a given stock varies with learning, interoperability and complementarity — the paper derives a central result. The Institutional Capital Theorem holds that institutional outcomes are determined by the services delivered by an institutional capital stock, and that this stock is the accumulated history of investment actually converted into durable assets, net of decay. Two jurisdictions with identical institutional expenditure, identical formal rules and identical measured governance may therefore diverge persistently in institutional performance, and the divergence is fully attributable to three separately observable quantities: conversion efficiency, depreciation and the productivity with which the stock is deployed. The claim is narrower than the proposition that institutions matter, and it is falsifiable in a single way: if measures of institutional capital add no explanatory or predictive power beyond governance, institutional quality and state capacity, the framework should be rejected. The paper specifies the underlying stock-flow model, which distinguishes gross institutional expenditure from durable asset formation and separates the quantity of the stock from the productivity of its deployment; distinguishes foundational, sectoral and adaptive Institutional Capital; proposes an Institutional Capital Test and a measurement architecture; and sets out three decisive tests that would establish or defeat the theory. Digital public infrastructure provides the principal application, because its productive value depends not only on technology but also on legal authority, organisational routines, interoperability, human capability, maintenance, cybersecurity, and public legitimacy.

Keywords: institutional capital; institutional assets; state capacity; governance; digital public infrastructure; public-sector productivity; development; sovereign risk.

1. Introduction

Development economics has long examined how societies accumulate and deploy physical, human, financial, natural and social capital. Institutions are also widely recognised as central to development, but they are generally analysed through concepts such as governance quality, rules, credibility, constraints, administrative capacity, and political settlements. These perspectives illuminate important dimensions of institutional performance. They do not, however, fully capture the possibility that some institutional capabilities may themselves constitute durable productive assets created through investment, accumulated over time, and capable of generating persistent returns.

This paper proposes a complementary framework: Institutional Capital Theory. Its central proposition is that certain durable institutional capabilities satisfy the defining economic characteristics of capital. They are produced through investment; persist beyond the period in which expenditure occurs; increase future productive capacity; can be maintained, upgraded, integrated or destroyed; and complement other forms of capital. The accumulated stock of such assets is institutional capital.

Institutional capital is the accumulated stock of durable and operational institutional assets that enhances a society's capacity to organise, coordinate, regulate and generate economic and public value over time.

The claim is narrower than the general assertion that institutions matter. It does not classify every institution, rule, reform or public expenditure as capital. Nor does it treat institutional quality and institutional capital as synonyms. Rather, it asks whether identifiable institutional capabilities meet a capital test and whether a stock-based representation improves explanation and measurement beyond prevailing approaches.

The distinction is consequential. Conventional indicators often measure perceptions, formal rules, observed outcomes or present administrative performance. A capital framework, in contrast, directs attention to formation, accumulation, maintenance, depreciation, complementarity, and intertemporal returns. It asks what productive institutional assets a society possesses, how those assets were built, how they interact, how their value changes over time and how efficiently they are deployed.

The digital century makes this question increasingly important. Digital identity systems, interoperable payment rails, integrated treasury platforms, statistical systems, land and company registries, procurement platforms and data-exchange mechanisms can persist across programmes and sectors. Their value may rise as they become interoperable, accumulate data, embed organisational learning and acquire public trust. However, technology alone is not institutional capital. It becomes an institutional asset only when it is operationally embedded in legal authority, organisations, routines, skills, governance and sustainable maintenance.

The purpose of this paper is not to replace institutional economics, governance theory or state-capacity research. It proposes a complementary analytical framework that treats certain durable institutional capabilities as productive capital. By defining, distinguishing and operationalising institutional capital, the paper establishes a testable foundation for subsequent theoretical and empirical work.

The paper's central claim can be stated immediately. Institutional outcomes are determined by the services that an institutional capital stock delivers. That stock is the accumulated history of institutional investment that was actually converted into durable assets, net of decay. It follows that two jurisdictions with identical institutional expenditure, identical formal rules and identical measured governance may diverge persistently in institutional performance, and that the divergence is fully attributable to three separately observable quantities: conversion efficiency, depreciation and the productivity with which the stock is deployed. Section 8.1 states this result formally as the Institutional Capital Theorem and derives it from four axioms set out in Section 4.1.

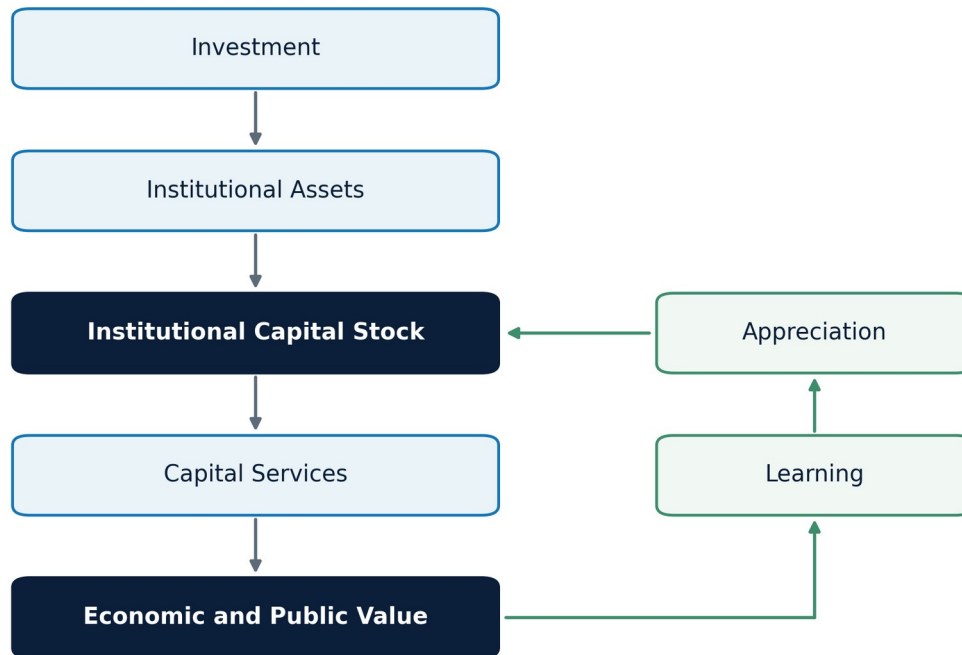
The claim is falsifiable in a single way. If measures of institutional capital add no explanatory or predictive power beyond established measures of governance, institutional quality and state capacity, then governance measures are sufficient statistics for institutional outcomes, the theorem's premises fail, and the framework should be rejected. Section 10.12 specifies the three tests that would establish or defeat it.

This paper makes five contributions. First, and centrally, it states and proves the Institutional Capital Theorem, deriving from four explicit axioms the result that institutional outcomes depend on the services an institutional stock delivers rather than on cumulative expenditure, formal rules or measured governance. Second, it defines the boundary conditions under which an institutional capability may be classified as capital rather than merely as a rule, an organisation, a technology, or a governance characteristic. Third, it provides a stock-flow model linking institutional investment, conversion efficiency, accumulation, appreciation, depreciation and productive service flows, and separates the quantity of the stock from the productivity with which it is deployed. Fourth, it integrates insights from state capacity, organisational capital, growth theory, public financial management and digital public infrastructure into a common analytical framework without collapsing their distinct objects of analysis. Fifth, it proposes an empirical strategy, reducible to three decisive tests, for establishing whether Institutional Capital possesses incremental explanatory and predictive power beyond existing measures of governance, institutional quality and state capacity.

The argument proceeds in four layers, which may be read separately. An ontology establishes what Institutional Capital is (Sections 3 and 4); an economics establishes how it behaves (Sections 5 to 8); a measurement framework establishes how it is observed (Sections 9 and 10); and an application establishes why it matters (Sections 11 to 13). Section 4.1 states the axioms from which the framework is derived, and Section 8.1 states the central theorem that the remainder of the paper is designed to test.

Figure 1 states the logic of the theory in its simplest form. Investment creates institutional assets; those assets constitute a capital stock; the stock yields capital services; the services generate economic and public value; and use generates learning, which appreciates the stock. Every subsequent section elaborates on one link in this chain.

Figure 1. The logic of Institutional Capital Theory



2. Intellectual Foundations and Theoretical Gap

Institutional Capital Theory is situated at the intersection of several mature literatures. New institutional economics explains how rules and governance arrangements shape incentives and transaction costs. Public administration and state capacity research examine the organisational ability of governments to formulate and implement collective decisions. Political economy explains how institutions emerge from distributions of power and conflict. Growth theory links institutional environments to productivity and factor accumulation. Organisational- and intangible-capital research demonstrates that knowledge, routines, software, data and organisational capabilities can constitute productive assets. Official diagnostic frameworks measure public financial management, administrative quality, and digital government maturity. The purpose of this section is therefore not to claim an unoccupied intellectual field, but to identify the specific analytical gap that remains across these traditions.

2.1 Antecedents

North defined institutions as humanly devised constraints that structure political, economic and social interaction, linking formal rules, informal norms, enforcement and path dependence to transaction costs and long-run performance (North, 1990, 1991, 2005). Williamson shifted attention to governance structures and the comparative organisation of transactions (Williamson, 1975, 1985, 2000), and Ostrom demonstrated that collective-action problems can be governed through diverse, often polycentric arrangements (Ostrom, 1990, 2005, 2010). These traditions establish why institutions matter and why institutional arrangements differ. They do not provide a stock-flow framework that identifies which

institutional capabilities are created through investment, persist as productive assets, generate services across time and sectors, or depreciate through neglect, fragmentation, and obsolescence. Institutional Capital Theory does not redefine institutions generally as capital; it isolates the narrower class of capabilities that satisfy explicit economic tests.

The organisational and state-capacity literatures supply the mechanisms through which investment becomes capability. Simon grounds administrative systems in bounded rationality, routines, authority structures and decision premises (Simon, 1947, 1955); Evans shows how embedded autonomy combines bureaucratic coherence with structured connections to productive actors (Evans, 1995; Evans & Rauch, 1999); and Fukuyama distinguishes state capacity from the scope of state functions (Fukuyama, 2004, 2013, 2014). Besley and Persson come closest to the present formulation, modelling investment in fiscal and legal capacity and the complementarities among capabilities (Besley and Persson, 2009, 2011). This theory generalises that insight in four respects: it extends beyond fiscal and legal capacity to foundational, sectoral, and adaptive assets; it separates expenditure from asset formation through an explicit conversion parameter; it incorporates appreciation alongside depreciation; and it centres on the productive services generated by the accumulated stock. State capacity is an enabled ability; Institutional Capital is the underlying stock of assets that enables that ability.

Political economy explains institutional origins rather than the productive properties of institutions once created. The work of Acemoglu, Johnson and Robinson accounts for how power, distributional conflict and historical processes shape which institutions emerge and endure (Acemoglu, Johnson and Robinson, 2001, 2005; Acemoglu and Robinson, 2012, 2019). That tradition is complementary but analytically distinct: political settlements enter this framework upstream, by determining the level and composition of institutional investment, the efficiency of its conversion into durable assets, the rate of depreciation and the allocation of institutional services. Capable institutions may serve inclusive or extractive purposes, so productive capability and normative desirability are analysed separately.

Growth theory and the intangible-capital literature supply the capital logic itself. Hall and Jones attribute large differences in output per worker partly to social infrastructure (Hall & Jones, 1999), while the growth tradition provides the vocabulary of accumulation, learning by doing, externalities and complementarity (Solow, 1956; Arrow, 1962; Romer, 1986; Lucas, 1988; Aghion & Howitt, 1992). Institutional Capital differs from social infrastructure in its unit of analysis: social infrastructure characterises the environment surrounding production, whereas Institutional Capital identifies a subset of invested-in, potentially measurable assets within it, which is conventionally absorbed into residual productivity. The closest economic analogy is organisational capital — firm-specific knowledge embodied in relationships, assignments and routines (Prescott & Visscher, 1980; Atkeson & Kehoe, 2005; Eisefeldt & Papanikolaou, 2013) — and the broader case for treating software, data, design and organisational competencies as investment (Corrado, Hulten and Sichel, 2005, 2009). If accumulated routines constitute productive capital within firms, corresponding capabilities within public institutions cannot be excluded merely because ownership is collective and valuation is difficult. The analogy is not identity: public institutional assets yield fiscal, regulatory, social, and legitimacy returns; their services may be non-rival; and their value depends on legal authority and public trust.

Official frameworks provide operational evidence but measure different constructs. The Worldwide Governance Indicators aggregate perceptions; PEFA, the IMF Fiscal Transparency Code, and the Public Investment Management Assessment record observable practices and compliance; OECD Government at a Glance combines inputs, processes, and outputs; and GovTech, the E-Government Development Index, and OECD digital-government frameworks document digital maturity. None is a ready-made measure of Institutional Capital. Perception indices may capture reputation without identifying durable assets; compliance diagnostics may record the existence of formal arrangements without measuring utilisation or service flows; maturity indices may establish that a digital platform exists without

demonstrating that it functions as productive capital. Measurement must therefore draw selectively on official indicators while reclassifying them around asset formation, durability, operational use, service flow, complementarity, maintenance and depreciation.

2.2 The theoretical gap and the bounded contribution

The adjacent literature identifies rules, governance structures, bureaucratic capability, investments in fiscal and legal capacity, social infrastructure, organisational knowledge, intangible assets, and digital systems as determinants of performance. What remains underdeveloped is a common framework that specifies when a public institutional capability qualifies as capital; separates stocks from flows; distinguishes expenditure from asset formation; models appreciation, depreciation and obsolescence; explains complementarity with other forms of capital; and establishes empirical tests against close rival constructs.

Institutional Capital Theory advances a bounded claim: identifiable institutional capabilities may be treated as productive capital only where they arise through investment, persist as durable and operational assets, generate intertemporal services, complement other productive factors, and are subject to accumulation, appreciation, depreciation and obsolescence.

This section establishes that Institutional Capital Theory is not a relabelling of institutions, governance or state capacity. It synthesises insights from those traditions while introducing a distinct stock-flow object of analysis, an explicit capital test and a falsifiable claim of incremental explanatory and predictive value.

Literature or framework	Primary object	Established contribution	Remaining gap	Institutional Capital contribution
New institutional economics	Rules, norms and governance arrangements	Incentives, transaction costs, path dependence and institutional diversity	No general stock-flow model of invested-in capabilities	Identifies durable, productive institutional assets
Public administration	Decision routines, bureaucracy and administrative organisation	Information processing, coordination and implementation	Capability is often treated as a current organisational attribute	Models accumulated assets underlying operational capability
State capacity	Fiscal, legal, coercive and bureaucratic capability	Investment in state capability and complementarity	Coverage is commonly limited to selected state functions	Generalises accumulation across foundational, sectoral and adaptive assets
Political economy	Power, conflict and institutional origins	Explains emergence, persistence and distributional consequences	Does not primarily value the productive stock after formation	Treats political conditions as determinants of investment, conversion and depreciation
Social infrastructure and growth	Institutional environment of production	Explains productivity and accumulation differences	Institutional effects often remain aggregated or residual	Introduces a potentially measurable productive input
Organisational and intangible capital	Knowledge, routines, software, data and competencies	Demonstrates that non-physical assets generate future services	Primarily firm-level and market-valued	Extends capital logic to public and collective institutional capability
PFM and governance diagnostics	Institutional practices, perceptions and compliance	Provides comparative indicators and operational diagnostics	Does not estimate stock, service flow or depreciation	Reclassifies indicators around formation, use, maintenance and returns
DPI and digital-government frameworks	Digital systems, maturity and service channels	Measures digital infrastructure and enabling conditions	Technology or maturity is not equivalent to productive capital	Defines socio-technical digital institutional assets and interoperability returns

Table 1. Institutional Capital Theory and adjacent constructs

3. The Conceptual Gap

3.1 Institutions in development analysis

Institutional analysis has demonstrated that rules, enforcement arrangements, credible commitments, administrative organisations, and political incentives shape economic performance. New institutional economics highlights transaction costs, property rights and the role of formal and informal rules. State-capacity scholarship examines the ability of public authorities to tax, enforce, regulate and provide collective goods. Governance research evaluates the quality, accountability and effectiveness of public institutions. Public administration studies how organisations, bureaucracies and management systems produce public value.

Institutional Capital Theory is indebted to these traditions. Its contribution lies not in rediscovering the importance of institutions, but in shifting the unit of analysis from the quality or performance of institutions at a point in time to the accumulated stock of productive institutional assets that enables performance across time.

3.2 Why a stock-based framework matters

Capability is often measured as a current attribute: a government can collect revenue, implement policy, regulate markets or deliver services. A stock-based approach asks what durable assets enable those capabilities. These may include integrated fiscal systems, professional administrative cadres, interoperable registries, legal enforcement architectures, statistical infrastructures, institutional memory and trusted coordination arrangements.

The distinction resembles the difference between output and productive capacity. Tax revenue is an outcome; the administrative systems, data, legal powers and trained personnel that repeatedly enable collection are productive assets. Service delivery is an outcome; the registries, payment systems, operating procedures and local administrative networks that sustain delivery are productive assets. State capacity describes what the state can do. Institutional capital describes the durable stock that enables that capability.

3.3 Why call it capital?

The use of the term capital must be justified economically rather than rhetorically. A candidate institutional asset should satisfy most or all of the following conditions:

- a. It is created or strengthened through purposeful investment.
- b. It persists beyond the accounting period in which the expenditure occurs.
- c. It contributes to future productive or service-delivery capacity.
- d. It can accumulate through repeated investment and learning.
- e. It can depreciate, become obsolete or be destroyed.
- f. It complements other productive assets.
- g. Its returns may extend across sectors, organisations, or time periods.
- h. It can be maintained, upgraded, integrated or repurposed.

These criteria constitute the Institutional Capital Test. The test does not require immediate monetary valuation. Human capital, social capital, and natural capital are also frequently measured using proxies rather than market prices. The relevant initial question is whether an asset possesses capital-like economic properties and whether those properties can be operationalised consistently.

Figure 2. Core economic properties of Institutional Capital



4. Definitions and Boundary Conditions

4.1 Axioms

The framework rests on four axioms. They are stated before the definitions so that the theory can be read as a construction rather than as a synthesis of adjacent literatures: the stock-flow model, the propositions and the empirical tests are all derived from them.

Axiom 1 — Service flow. A stock of capital yields a flow of productive services in each period. Capital is valued for that service flow rather than for the expenditure that created it.

Axiom 2 — Differential durability. Institutional capabilities persist beyond the period during which expenditure occurs, and they differ in the rate at which they persist.

Axiom 3 — Conditional conversion. Institutional expenditure creates institutional capability only under identifiable conditions of authority, ownership, operation, maintenance and use. Where those conditions fail, expenditure produces activity without producing an asset.

Axiom 4 — Use-dependent productivity. The service yield of a given institutional stock varies with learning, interoperability, network reach and complementary capabilities. Quantity and quality are therefore distinct properties of the same stock.

Axioms 1 and 2 establish that institutional capabilities can be treated as capital. Axiom 3 prevents the identification of expenditure with capital formation. Axiom 4 introduces the quantity-quality distinction on which measurement and the central theorem depend. The axioms are not self-evident truths; they are the minimum commitments required for the theory to be constructed, and each is empirically vulnerable.

4.2 Core definitions

Concept	Definition	Analytical status
Institutional investment	The flow of resources devoted to creating, strengthening, integrating or maintaining productive institutional capabilities.	Flow
Institutional asset	An individual durable and operational institutional capability that meets the Institutional Capital Test.	Asset
Institutional capital	The accumulated stock of durable and operational	Stock

Concept	Definition	Analytical status
	institutional assets.	
Institutional capability	What the accumulated institutional stock enables an institution or system to do.	Enabled capacity
Institutional productivity	The efficiency with which institutional capability is converted into economic, fiscal or social value.	Performance ratio
Institutional appreciation	An increase in the productive value of institutional capital through learning, integration, network effects, trust or improved use.	Dynamic change
Institutional depreciation	A decline in productive value caused by neglect, fragmentation, obsolescence, capability erosion or loss of legitimacy.	Dynamic change
Institutional return on investment	The stream of attributable benefits generated by institutional investment relative to its full economic cost.	Evaluation concept

4.3 What institutional capital is not

Institutional capital is not synonymous with institutions as a whole. Institutions include rules, norms, organisations, and political arrangements, many of which may not satisfy the capital test. A constitutional provision, for example, may structure authority without itself constituting a productive asset. It may nevertheless enable the formation or protection of institutional capital.

Institutional capital is not equivalent to governance quality. Governance indicators frequently capture accountability, rule of law, corruption control, effectiveness or perceptions of institutional performance. Institutional capital concerns the underlying accumulated productive stock. A country may have valuable administrative assets that are used inefficiently or deployed toward undesirable ends. Conversely, favourable governance perceptions do not necessarily reveal the depth, durability or integration of productive institutional assets.

Institutional capital is not identical to state capacity. State capacity is the ability of the state to achieve objectives, commonly in taxation, coercion, law enforcement or service delivery. Institutional capital is one possible foundation of that capacity. Capability is therefore downstream from the stock, although political authority, incentives and leadership also affect whether the stock is effectively used.

Institutional capital is not organisational capital in the narrow firm-level sense. Organisational capital generally refers to firm-specific routines, management practices, knowledge and structures that raise enterprise productivity. Institutional capital may include analogous assets in public or collective systems, but it extends across organisations and may operate at sectoral, national or regional levels.

Institutional capital is not technology. A software platform that is unused, legally unsupported, poorly governed or unsustainable is not a productive institutional asset. Digital technology qualifies only when embedded in operating institutions and capable of generating durable value.

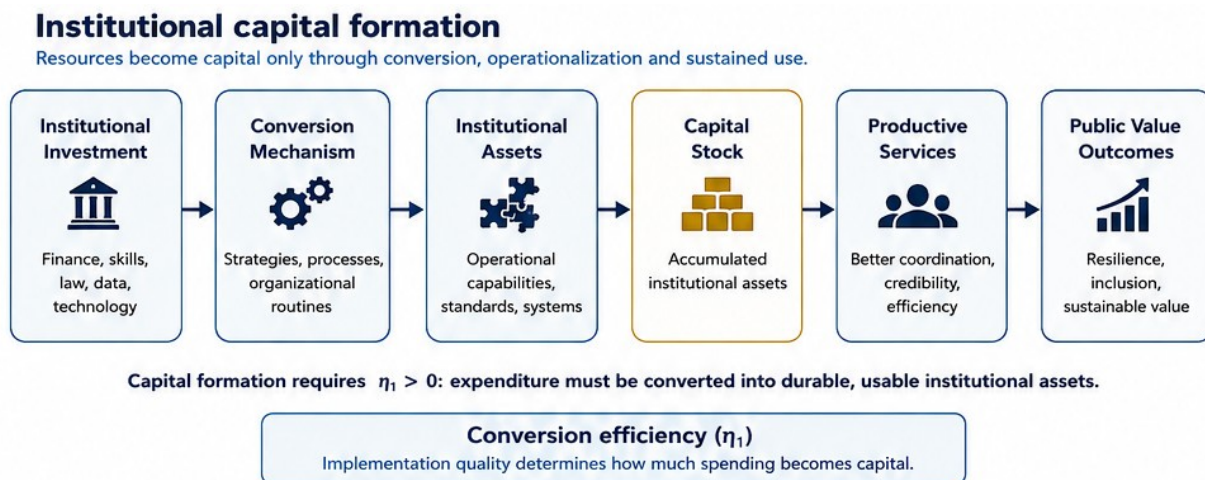
5. Institutional Capital Formation and Dynamics

5.1 From investment to productive assets

Institutional expenditure does not automatically create institutional capital. Spending becomes investment only when it produces or preserves a durable and operational asset. Training that is disconnected from organisational roles, a registry that is not updated, a platform that cannot interoperate, or a reform that disappears when external financing ends may generate activity without generating capital.

Asset formation, therefore, depends on conversion. Resources must be translated into legal authority, operating procedures, human competence, technical infrastructure, organisational ownership, maintenance arrangements and sustained use. The conversion rate between institutional expenditure and institutional asset formation is itself a central object of analysis.

Figure 3. Institutional capital formation



5.2 Accumulation

Institutional capital accumulates when successive investments build upon rather than replace or fragment existing assets. Accumulation may occur through the extension of coverage, improvement of data quality, integration of systems, codification of routines, retention of skilled personnel, organisational learning and the creation of interoperable standards.

Accumulation is path-dependent. New investments inherit the strengths and weaknesses of earlier systems. A country with reliable civil registration can build more effective digital identity and social-protection systems than one that begins with fragmented records. An integrated treasury can support debt management, procurement, fiscal reporting and expenditure control more effectively than isolated applications serving individual units.

5.3 Appreciation

Unlike many physical assets, institutional assets may appreciate through use. Repeated operation can improve routines, data quality, user familiarity and coordination. Interoperability can create network

effects: the value of an identity system rises when it connects securely to payments, tax, health, education and social-protection systems. Trust may also increase productive value by raising adoption and compliance.

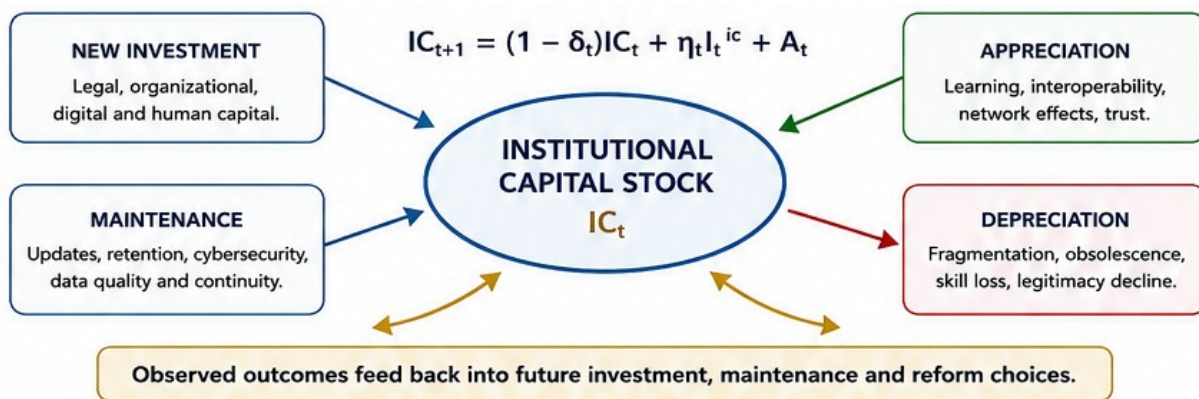
Appreciation is not automatic. Learning requires feedback, institutional memory and incentives to improve. Network effects require standards and governance. Data accumulation increases value only when information remains accurate, lawful, secure and usable.

5.4 Depreciation

Institutional capital depreciates through neglect, fragmentation, technological obsolescence, loss of skilled personnel, politicisation, corruption, declining legitimacy, legal uncertainty, and organisational disruption. Depreciation may be gradual, as systems are allowed to deteriorate, or abrupt, as conflict, political purges, or fiscal collapse destroy operational capacity.

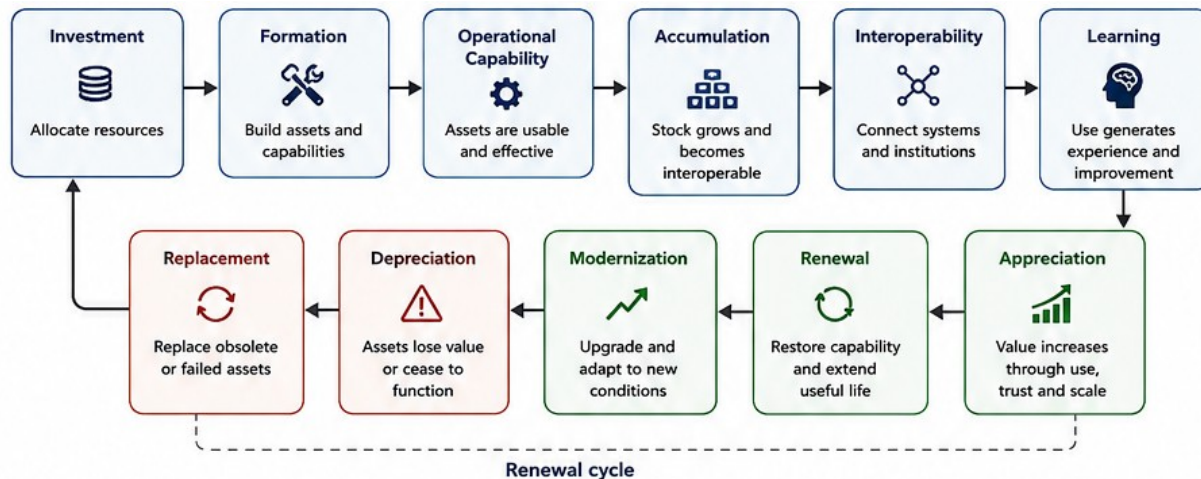
Some depreciation is hidden. A platform may remain technically functional while data quality deteriorates, users bypass procedures, or public trust collapses. Measuring institutional capital, therefore, requires indicators of operational use, maintenance and reliability rather than the mere existence of formal systems.

Figure 4. Accumulation, appreciation and depreciation



Formation, accumulation, appreciation and depreciation are phases of a single lifecycle rather than competing accounts of institutional change. Investment produces formation; formation produces operational capability; capability accumulates and becomes interoperable; interoperability and use generate learning and appreciation; and renewal or modernisation determines how long the appreciating phase is sustained before depreciation requires replacement. The policy question is therefore not whether institutional assets decay, but how long their productive phase can be extended.

Figure 5. The Institutional Capital lifecycle



6. Complementarity and Transmission Mechanisms

6.1 Complementarity with other forms of capital

Institutional capital raises value partly by increasing the productivity of other assets. Physical infrastructure is more productive when procurement, maintenance and regulation function. Human capital is more productive when credentials are recognised, labour markets operate, and public services are delivered reliably. Financial capital is more productive when contracts are enforceable, information is credible, and payment systems are efficient. Natural capital is used more sustainably when rights, monitoring, and enforcement are effective.

Complementarity implies that returns may be nonlinear. Digital identity, payments and social registries may each have limited value in isolation. Their integration, combined with legal authority, data protection, administrative routines and accessible grievance mechanisms, can create a system whose value exceeds the sum of its parts. This does not guarantee increasing returns, but it provides a testable basis for examining interaction effects among institutional assets.

6.2 Transmission mechanisms

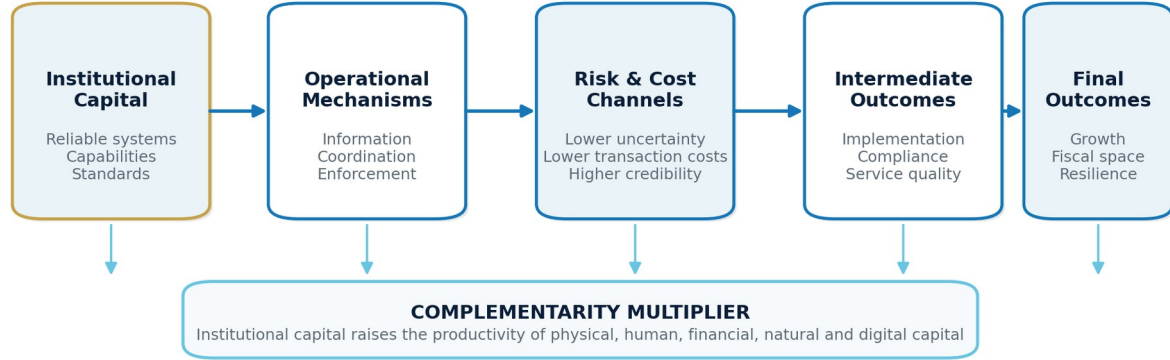
Institutional capital affects outcomes through several mechanisms. Better information reduces uncertainty and improves targeting, planning and accountability. Coordination lowers duplication and implementation failure. Enforcement supports contracts and compliance. Credibility reduces the risk that policies or commitments will be reversed. Service-delivery systems reduce transaction costs for citizens and firms. Resilience assets improve continuity during shocks.

These mechanisms may also affect sovereign risk. Reliable fiscal information, integrated debt management, predictable administration and credible revenue systems can reduce uncertainty surrounding public finances. The paper does not define confidence as a separate form of capital. Confidence, trust and credibility are treated as transmission mechanisms through which productive institutional assets may influence investment and financing conditions.

Figure 6. Institutional capital transmission

Institutional capital transmission

How accumulated institutional assets affect economic, fiscal and social performance



The formal model translates the preceding literature into a common dynamic framework. Besley and Persson motivate purposeful investment in state capability; Simon and Evans inform the conversion of expenditure into operational routines and organisational ownership; organisational-capital research provides the stock-and-depreciation analogy; Ostrom and learning-by-doing traditions motivate adaptation and appreciation; and Hall and Jones motivate the link between institutional capability and productivity. The equations are therefore not intended to displace these traditions, but to state their intersecting implications in a form that can be measured and tested.

7. Formal Mathematical Framework

7.1 Notation and stock–flow distinction

Institutional Capital Theory distinguishes the accumulated stock of productive institutional assets from the flows that create, maintain, integrate or erode that stock. Let IC_t denote the institutional-capital stock at the end of period t ; I_t gross institutional investment; D_t depreciation; and A_t appreciation generated by learning, integration, network effects and organisational adaptation.

The fundamental stock-flow identity is:

$$IC_{t+1} = IC_t + I_t - D_t + A_t \quad (1)$$

Equation (1) makes the theory dynamic. Current institutional capability depends not only on contemporaneous reform effort but also on inherited assets, maintenance failures and the capacity to increase the productive value of existing systems.

A more structural specification separates depreciation and investment-conversion efficiency:

$$IC_{t+1} = (1 - \delta_t)IC_t + \eta_t I_t + A_t \quad (2)$$

Here, δ_t is the effective depreciation rate, and η_t is the share of gross institutional investment that is converted into durable and operational assets. This formulation prevents the model from equating expenditure with capital formation: weak implementation, fragmented procurement or absent organisational ownership may make η_t small even when spending is substantial.

The components also map to distinguish theoretical mechanisms: institutional investment reflects purposeful capability building; conversion efficiency reflects implementation quality, organisational ownership, and administrative coordination; depreciation captures maintenance failure, obsolescence, skill loss, and legitimacy erosion; and appreciation captures learning, interoperability, network effects, and trust. Political institutions and settlements affect each term by shaping incentives, continuity, distribution and control.

7.2 Appreciation and depreciation

Institutional appreciation can be represented as a function of organisational learning, network integration, operational optimisation, and complementary capabilities:

$$A_t = f(L_t, N_t, O_t, C_t) \quad (3)$$

L_t denotes learning; N_t network integration or interoperability; O_t operational optimisation; and C_t complementary institutional capabilities. Appreciation is therefore an increase in the productive services generated by an existing asset, not merely an increase in its replacement cost. Depreciation may be modelled as $D_t = \delta_t IC_t$, with δ_t rising when maintenance, legitimacy, skills, cybersecurity, data quality, or organisational continuity deteriorate.

7.3 Institutional production function

A parsimonious augmented production function introduces Institutional Capital alongside physical and human capital:

$$Y_{it} = \mathcal{A}_{it} K_{it}^\alpha H_{it}^\beta IC_{it}^\gamma \quad (4)$$

Y_{it} is output or public value; K_{it} physical capital; H_{it} human capital; IC_{it} institutional capital; and $\mathcal{A}_{it}$ residual productivity. The parameter γ captures the direct elasticity of output with respect to Institutional Capital. The expression is not intended to impose a universal Cobb–Douglas technology; rather, it provides a tractable benchmark for testing whether institutional capital stock adds explanatory power.

7.4 Complementarity

Institutional Capital Theory predicts that institutional assets raise the marginal productivity of other forms of capital. For any complementary capital input K_m , the core condition is:

$$\frac{\partial^2 Y}{\partial IC \partial K_m} > 0 \quad (5)$$

A positive cross-partial derivative means that an additional unit of physical, human, financial, digital or natural capital is more productive when supported by stronger institutional capital. Empirically, this implies interaction effects, thresholds and possible increasing returns from interoperability rather than a purely additive relationship.

7.5 Institutional Return on Investment

For appraisal purposes, an Institutional Return on Investment measure can compare the discounted incremental benefits attributable to an institutional asset with the discounted costs of creating, operating and maintaining it:

$$IROI_t = \frac{PV(\Delta B_{t:t+n}) - PV(C_{t:t+n})}{PV(C_{t:t+n})} \quad (6)$$

ΔB represents incremental fiscal, economic or public-value benefits over the evaluation horizon, and C represents investment, operating, maintenance and transition costs. IROI should be treated as an appraisal construct rather than a claim that all institutional benefits can be monetised precisely. Distributional effects, resilience and option value may require complementary non-monetary assessment.

7.6 Quantity, quality and capital services

The preceding specifications treat Institutional Capital as a single magnitude. Axiom 4 requires a second dimension. Let IC_t denote the quantity of the stock and q_t its service intensity: the productive services delivered per unit of stock. Institutional capital services are then.

$$S_t = q_t \cdot IC_t \quad (11)$$

Service intensity is itself dynamic. Learning, interoperability, network integration and complementarity raise the services obtained from an unchanged stock:

$$q_{t+1} = q_t (1 + a_t), \quad a_t = f(L_t, N_t, I_t, C_t) \quad (12)$$

The distinction has three consequences. First, two jurisdictions holding identical institutional stocks may deliver different levels of service, so coverage and existence indicators are insufficient. Second, service intensity can be raised without gross investment, which is the formal content of appreciation. Third, a stock can remain constant while q_t falls, which is the formal content of hidden depreciation: outcomes

deteriorate even though expenditure, formal rules, and platform coverage remain unchanged. An Institutional Capital Index must therefore be two-dimensional, reporting the size of the stock and the productivity of its deployment separately rather than collapsing them into a single score.

Figure 7. Integrated architecture of Institutional Capital Theory

Integrated architecture of Institutional Capital Theory

A stock-flow framework linking formation, capability, productive services, risk and outcomes

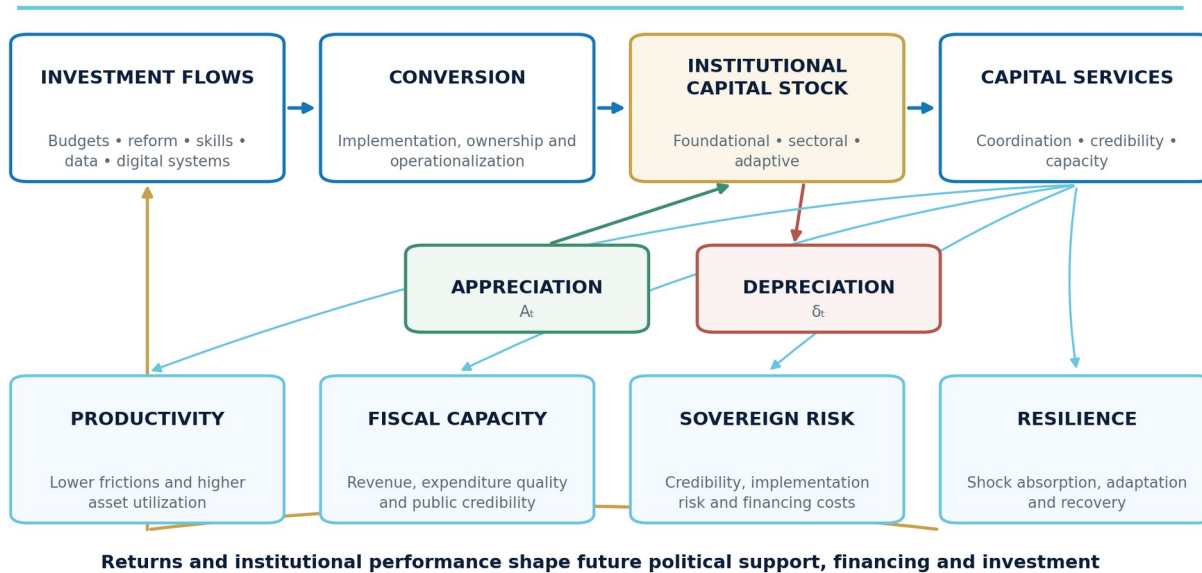
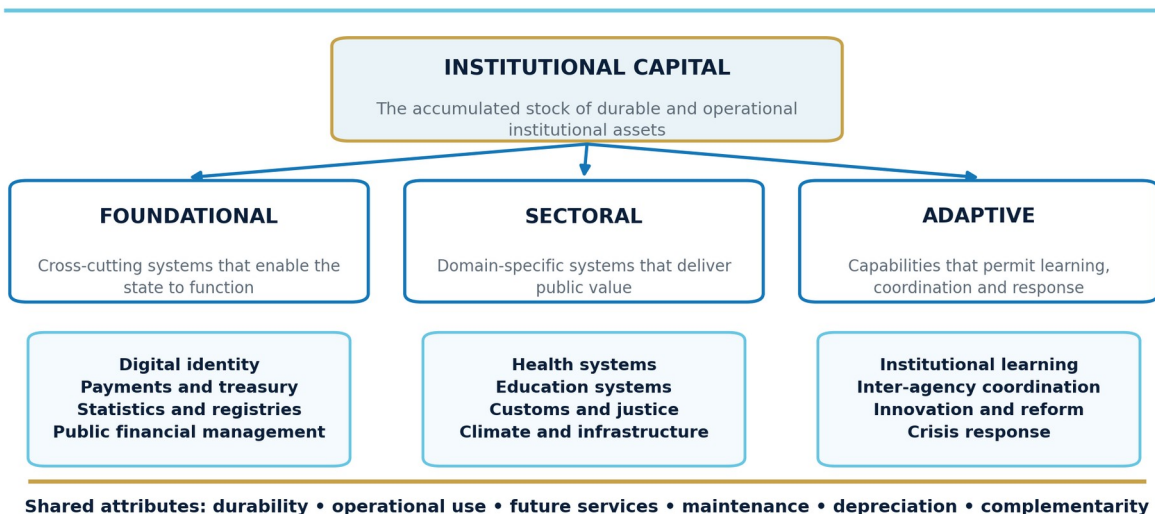


Figure 8. Nested structure of Institutional Capital

Nested structure of Institutional Capital

A three-part taxonomy for theory, measurement and empirical testing



8. Formal Propositions

8.1 The Institutional Capital Theorem

The framework yields one central result, from which the propositions below follow.

Institutional Capital Theorem. Under Axioms 1 to 4, institutional outcomes are determined by the flow of institutional capital services, $S_t = q_t \cdot IC_t$, where the stock is the accumulated history of converted investment net of depreciation:

$$IC_t = \sum_{s \leq t} \eta_s I_s \prod_{u=s+1}^t (1 - \delta_u) \quad (13)$$

It follows that: (i) cumulative institutional expenditure is neither necessary nor sufficient for institutional capability; (ii) two jurisdictions with identical institutional expenditure, identical formal rules and identical measured governance may exhibit persistently different institutional outcomes; and (iii) the whole of that divergence is attributable to differences in conversion efficiency, depreciation and service intensity, each of which is separately observable.

Proof. By Axiom 3, gross investment enters the stock only through the conversion coefficient, which lies between zero and one. By Axiom 2, the share of past converted investment surviving to period t is the cumulative product of one minus the depreciation rate. Equation (13) follows directly. By Axiom 1, outcomes depend on the service flow rather than on the historical cost of the stock, and by Axiom 4, that flow is the product of the stock and its service intensity. Consider two jurisdictions with identical investment paths. If conversion efficiency, depreciation, or service intensity differ at any date, their service flows differ, and, by Axiom 1, their outcomes differ. Conversely, if formal rules and governance ratings were sufficient statistics for those three quantities, no such divergence could arise. Axiom 3 makes conversion depend on operational conditions that formal rules do not determine, and Axiom 4 makes service intensity depend on realised interoperability and learning. Divergence is therefore possible, and equations (11) and (13) account for it exhaustively.

Corollary 1 — Falsifiability. Governance and state-capacity measures are insufficient indicators of institutional outcomes. Measures of institutional capital must therefore add incremental explanatory power; if they do not, one or more of the axioms fail.

Corollary 2 — Appreciation. Where service intensity rises through interoperability and learning, outcomes improve without any increase in gross investment. Appreciation is thus an empirical prediction rather than a definitional claim.

Corollary 3 — Hidden depreciation. A constant stock with falling service intensity yields deteriorating outcomes, with no observable change in expenditure, formal institutions, or platform coverage. This is the signature of institutional decay that expenditure-based and rules-based measures cannot detect.

8.2 Propositions

The propositions below restate the components of the theorem in a form that can be examined separately.

Proposition 1 — Capital formation

Institutional expenditure generates institutional capital only when it creates or preserves durable and operational institutional assets.

Proposition 2 — Accumulation

Institutional capital accumulates through sustained investment, organisational learning, integration and maintenance.

Proposition 3 — Depreciation

Institutional capital depreciates through neglect, fragmentation, technological obsolescence, capability erosion and loss of legitimacy.

Proposition 4 — Complementarity

Institutional capital increases the productivity of physical, human, financial, natural, technological and social capital.

Proposition 5 — Productivity

The effects of institutional capital on development depend on both the size of the accumulated stock and the productivity with which it is deployed.

Proposition 6 — Incremental explanatory power

Measures of institutional capital should explain relevant institutional and development outcomes beyond established measures of governance, institutional quality and state capacity.

9. Measuring Institutional Capital

9.1 Measurement principles

- Measure capability rather than announced intention.
- Measure operational function rather than expenditure alone.
- Capture durability, maintenance and repeated use.
- Distinguish the size of the stock from the productivity of deployment.
- Recognise complementarities and integration across assets.
- Use transparent indicators and test sensitivity to alternative specifications.

9.2 Index architecture in outline

A first-generation Institutional Capital Index organises indicators across dimensions covering foundational systems, fiscal and legal capability, administrative and data infrastructure, regulatory capability, adaptive capacity and maintenance. For empirical work, the aggregate should be decomposed into Foundational, Sectoral and Adaptive Institutional Capital, so that outcome-specific tests are possible and capability is not treated as homogeneous. Consistent with Section 7.6, the index must be reported in two dimensions rather than one: the size of the stock and the productivity of its deployment. Candidate indicators can be reclassified from existing official data families — PEFA, IMF fiscal transparency and public-investment assessments, OECD public-governance statistics, identification, and digital-government sources — into asset formation, durability, operational use, service flow, maintenance, and depreciation.

An institutional balance sheet complements the index as a strategic rather than an accounting instrument: the asset side records durable, productive capabilities, while the liability side records fragmentation, obsolete systems, unfunded maintenance, unresolved mandates, data risks, capability gaps, and declining trust. The principal measurement challenges are the risk of proxy drift toward governance perceptions, the scarcity of maintenance and utilisation data, and the difficulty of directly observing service intensity. The full-dimensional architecture, indicator set, weighting, and validation strategy are developed separately; this section establishes only that the construct is operationalizable and that its measurement is separable from the theory.

10. Empirical Strategy and Identification

10.1 From Conceptual Theory to Empirical Science

Institutional Capital Theory ultimately stands or falls on its empirical performance. The theory proposes that certain institutional capabilities function as productive capital. This proposition is meaningful only if Institutional Capital explains observable economic outcomes more effectively than existing measures of governance, institutional quality or state capacity.

Accordingly, the empirical objective is not merely to demonstrate that institutions matter. Decades of research have established that relationship. The sharper question is whether Institutional Capital provides incremental explanatory and predictive power beyond established institutional measures. The relevant estimand is the marginal contribution of Institutional Capital after accounting for conventional institutional, macroeconomic and structural determinants.

10.2 Research questions

Can institutional capital be measured as a construct distinct from governance and state capacity?
Does institutional capital explain fiscal, administrative or development outcomes beyond existing indicators?

Do institutional assets exhibit accumulation and depreciation dynamics?

Do complementarities among institutional assets generate interaction or threshold effects?

Does institutional capital improve resilience and reduce uncertainty or sovereign financing costs?

10.3 Hypotheses

H1 — Growth and productivity. Higher Institutional Capital is positively associated with GDP per capita growth or productivity, even after controlling for investment, education, openness, macroeconomic stability, governance, and institutional quality.

H2 — Domestic revenue mobilisation. Higher Institutional Capital is associated with stronger tax-to-GDP performance, higher VAT productivity, greater customs efficiency, and lower revenue volatility.

H3 — Sovereign financing. Countries with greater Institutional Capital exhibit lower sovereign bond spreads, EMBI spreads, CDS premiums or government borrowing rates, conditional on debt, inflation and standard risk determinants.

H4 — Complementarity. Digital Institutional Capital produces stronger effects when identity, payments, taxation, registries and administrative data are interoperable and supported by complementary organisational capabilities.

H5 — Resilience. Institutional Capital moderates the effects of economic, health, or climatic shocks, producing smaller output losses, faster recovery, more effective emergency transfers, and a more credible fiscal adjustment.

10.4 A Multi-Level Empirical Strategy

The empirical programme should proceed in four stages. First, construct validation should test whether proposed indicators form a coherent latent structure and remain distinct from governance and state-capacity measures. Second, cross-country and subnational analyses should estimate associations with revenue mobilisation, service delivery, firm productivity, investment and resilience. Third, event studies and quasi-experimental designs should examine major institutional investments or disruptions. Fourth, dynamic panel models should test accumulation, persistence and depreciation.

Stage One — Construct validation. Use exploratory and confirmatory factor analysis, reliability testing, and convergent and discriminant validity to determine whether Institutional Capital is a coherent latent construct distinct from governance and state capacity.

Stage Two — Cross-country performance. Estimate whether Institutional Capital explains development outcomes after including conventional controls and rival institutional measures.

$$Y_{it} = \alpha + \beta IC_{it} + \gamma'X_{it} + \mu_i + \tau_t + \varepsilon_{it} \quad (7)$$

The coefficient of interest is β . A positive and robust β after controlling for governance and institutional quality would indicate incremental explanatory value; it would not, by itself, establish causality.

Stage Three — Sovereign risk. Estimate the relationship between Institutional Capital and sovereign financing costs:

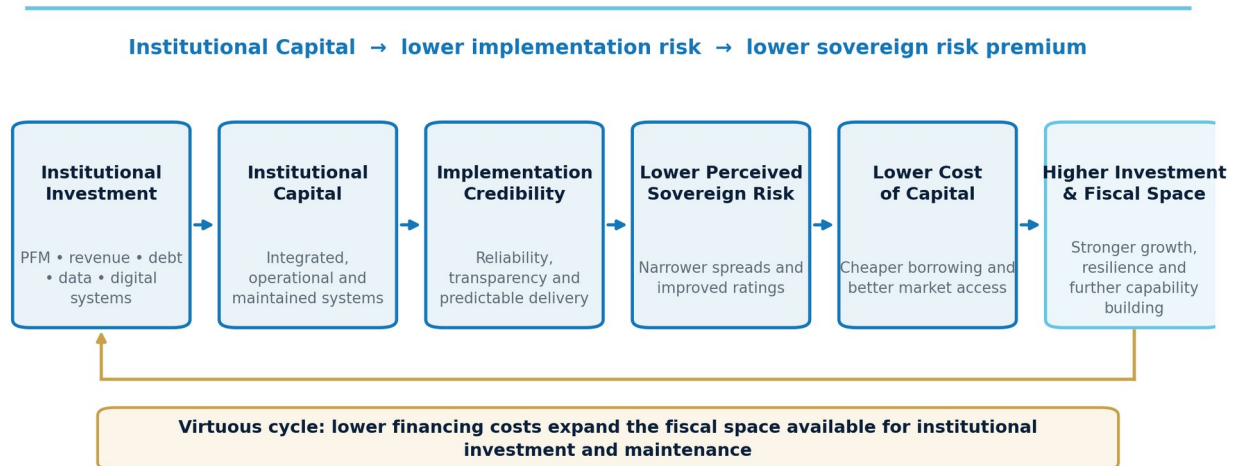
$$Spread_{it} = \alpha + \beta IC_{it} + \gamma Debt_{it} + \delta Inflation_{it} + \theta Governance_{it} + \mu_i + \tau_t + \varepsilon_{it} \quad (8)$$

The predicted mechanism is that stronger institutional assets reduce perceived implementation, information and fiscal-management risk, thereby lowering the sovereign risk premium and the cost of capital.

Figure 9. Institutional Capital and sovereign financing costs

Institutional Capital and sovereign financing costs

A risk-compression transmission mechanism

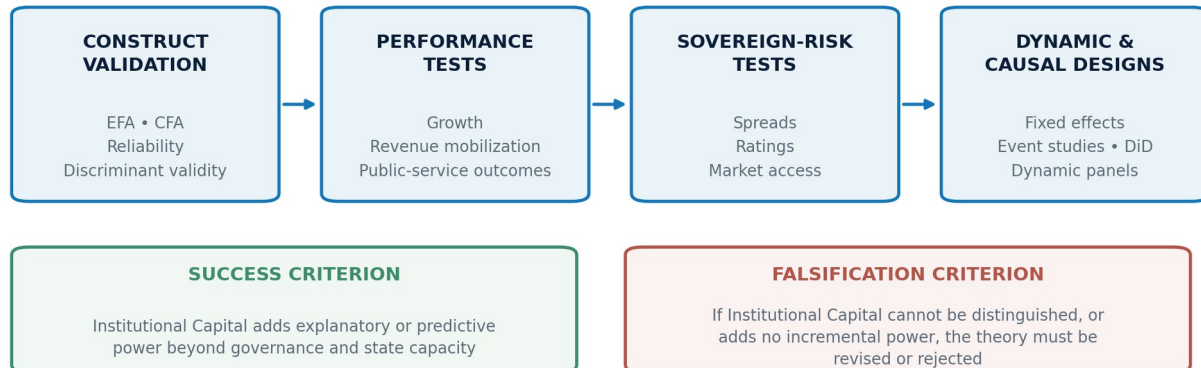


Stage Four — Dynamic analysis. Use country and year fixed effects, dynamic panels where justified, and event-study or difference-in-differences designs around identifiable reforms. These methods permit tests of whether changes in Institutional Capital precede changes in outcomes while accounting for persistence and common shocks.

Figure 10. Four-stage empirical validation strategy

Four-stage empirical validation strategy

The theory succeeds only if the construct is distinct, explanatory, predictive and robust



10.5 Measuring Institutional Appreciation

Appreciation should be measured as the increase in productive use generated by learning, interoperability, network effects and organisational adaptation. Two countries may possess technically similar digital identity systems while deriving sharply different value from them, because one integrates identity with taxation, banking, procurement, health, and education. Candidate indicators include the number and depth of cross-sector integrations, authenticated transactions, reduction in duplicate records, reuse of verified attributes and measurable improvements in service or fiscal performance.

10.6 Measuring Institutional Depreciation

Institutional depreciation may be observed through declining compliance, rising processing delays, system outages, cybersecurity incidents, loss of skilled personnel, platform fragmentation, deteriorating statistical quality, and declining public trust. Because deterioration may remain latent during normal periods, stress performance during crises should be treated as an informative depreciation test.

10.7 Identification Challenges

The principal threats are reverse causality, omitted-variable bias, measurement error and simultaneity. Economic growth may finance institutional investment, while Institutional Capital may improve growth. Historical institutions, education, political settlements, geography or culture may affect both the stock and observed outcomes. Latent-variable indicators contain noise, and institutional investment, fiscal capacity and growth evolve jointly. Cross-sectional correlations should therefore be interpreted cautiously.

10.8 Identification Strategy

The principal challenge is reverse causality. Stronger economic performance may finance institutional investment, while institutional capital may, in turn, improve performance. Identification strategies may include phased implementation, eligibility thresholds, exogenous financing windows, legal mandates, historical administrative boundaries, institutional disruptions, staggered digital-system adoption, and matched-comparison designs. No single strategy will establish the theory. Credibility will depend on convergent evidence across settings and methods.

Proposition	Expected relationship	Possible outcome variables	Key rival explanation
Formation	Operational assets mediate the effect of institutional spending	Service reliability, processing efficiency, coverage	Spending level alone
Accumulation	Past stock predicts present capability after controlling for current spending.	Administrative performance, fiscal capacity	Contemporaneous governance quality
Depreciation	Maintenance failure or disruption reduces future capability	System uptime, data quality, implementation continuity	Temporary management shock
Complementarity	Interactions among assets produce larger effects than isolated components	Take-up, compliance, targeting, and firm productivity	Simple additive effects
Productivity	Similar stocks yield different outcomes depending on deployment quality	Output per institutional resource unit	Political incentives or leadership
Incremental value	Institutional-capital measures improve model fit beyond standard indicators.	Growth, revenue, resilience, spreads	Governance/state-capacity proxies

10.9 Complementarity and Shock-Moderation Tests

The complementarity hypothesis can be tested through interaction models in which Z represents a complementary institutional asset, interoperability measure or shock exposure:

$$Y_{it} = \alpha + \beta_1 IC_{it} + \beta_2 Z_{it} + \beta_3 (IC_{it} \times Z_{it}) + \gamma' X_{it} + \varepsilon_{it} \quad (9)$$

A positive β_3 in a complementarity specification indicates that the productivity of Institutional Capital rises with the complementary asset. In a shock model, a coefficient showing that Institutional Capital offsets the adverse effect of exposure would support the resilience mechanism.

10.10 Latent Measurement and Predictive Validity

A basic measurement model relates observed indicator x_{jit} to the latent Institutional Capital stock:

$$x_{jit} = \lambda_j IC_{it} + u_{jit} \quad (10)$$

The index should be evaluated for construct validity, discriminant validity, explanatory validity and predictive validity. Out-of-sample forecasting of revenue performance, sovereign spreads or recovery

from shocks provides a demanding test: a new construct is more credible when it improves prediction relative to established benchmarks.

10.11 Rival Hypotheses and Falsifiability

Institutional Capital Theory challenges the view that governance, state capacity, institutional quality, or digital infrastructure alone explain the relevant outcomes. The theory is supported only if Institutional Capital is statistically distinguishable from these constructs and demonstrates incremental explanatory or predictive power. If no such contribution is found across relevant outcomes, or if accumulation, depreciation and complementarity cannot be observed, the framework must be revised or rejected.

10.12 Three decisive tests

The strategy above can be reduced to three tests. Each corresponds to a clause of the Institutional Capital Theorem, and each can be executed independently by other researchers.

Test A — Incremental explanatory power. Does Institutional Capital outperform governance? Institutional capital measures are included alongside established governance, institutional quality, and state capacity indicators in models of revenue performance, service delivery, implementation, and sovereign financing costs. The theorem requires a statistically and economically meaningful incremental contribution. Failure supports Corollary 1 in the negative and falsifies the framework.

Test B — Predictive power. Does Institutional Capital predict future outcomes? Measures constructed at one date are used to forecast outcomes at later dates, out of sample, against benchmarks built from governance indicators and lagged outcomes. A construct that explains the past but does not improve forecasts is of limited value; the demanding version of this test is the prediction of recovery paths following fiscal, health or climate shocks.

Test C — Mechanisms. Does appreciation occur through interoperability? The mechanism claim is tested directly by examining whether service intensity rises following interoperability events — the integration of identity, payment, registry or data-exchange systems — holding gross investment constant, and whether the marginal return to each foundational asset rises with the number of connected institutions. This test discriminates most sharply between the theory and a purely additive account of institutional investment.

Tests A, B and C are stated as a roadmap rather than as results. The framework is offered for testing and, if the tests fail, revised or abandoned.

11. Digital Public Infrastructure as an Application

Digital public infrastructure is a principal application rather than the definition of Institutional Capital. Digital identity, interoperable payments and trusted data exchange can become foundational institutional assets because they are reusable across sectors and can lower verification, transaction and coordination costs. Their capital character, however, depends on institutional embedding rather than technical installation.

11.1 The socio-technical asset

The relevant assets include the platform, legal mandate, operating standards, governance arrangements, cybersecurity, data-protection controls, trained personnel, financing model, grievance mechanisms, and organisational routines required for sustained use. A platform without these complements is technological infrastructure, not necessarily Institutional Capital.

11.2 Interoperability and appreciation

DPI illustrates institutional appreciation. The replacement cost of an identity or payment system may remain stable while its productive service rises as more agencies, firms, and citizens use it. Secure interoperability can create network effects, expand the range of services, improve data quality and reduce duplication. These gains are captured by the appreciation term rather than by gross investment alone.

11.3 Failure, depreciation and exclusion risks

Digital institutional assets may depreciate due to software obsolescence, cybersecurity failures, fragmented standards, inaccurate data, vendor dependency, skill loss, declining trust, or weak maintenance. They may also produce exclusion, surveillance or concentration risks. The theory, therefore, requires measures of operational reliability, accessibility, safeguards and legitimacy, not merely coverage or platform existence.

11.4 Empirical implications

The DPI application generates clear tests. Integrated identity, payments and administrative data should have larger effects than isolated systems; interoperability should raise the marginal return to each foundational asset; and institutional safeguards should moderate adoption and service quality. If technology-maturity indicators explain outcomes while the wider socio-technical asset measures do not, the Institutional Capital formulation would require revision.

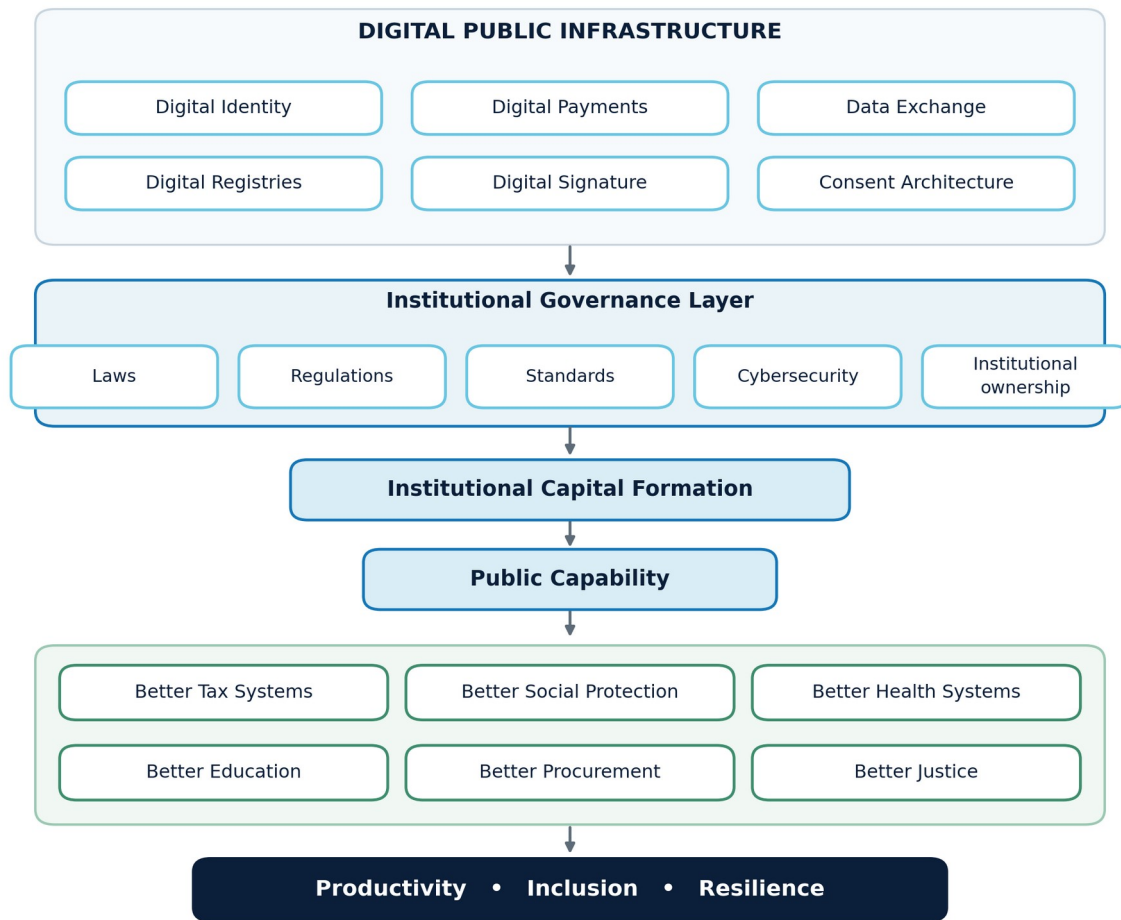
11.5 The capital test for digital systems

Digital public infrastructure becomes Institutional Capital only when digital systems satisfy five conditions:

- durability, so that the asset persists beyond the project cycle that created it;
- institutional ownership, so that mandate, control and accountability rest with public institutions;
- interoperability, so that the asset is reusable across agencies and sectors;
- continuous maintenance, so that operational reliability and data quality are preserved;
- organisational learning, so that repeated use improves administrative routines.

Figure 11 sets out the illustrative architecture. Foundational platforms — digital identity, digital payments, data exchange, digital registries, digital signatures, and consent architecture — acquire capital character only through an institutional governance layer comprising laws, regulations, standards, cybersecurity, and institutional ownership. Capital formation then converts into public capability and, through stronger tax, social protection, health, education, procurement and justice systems, into productivity, inclusion and resilience.

Figure 11. Digital public infrastructure as Institutional Capital



The DPI application demonstrates how the theory converts a contemporary policy category into a falsifiable capital framework. It also clarifies that digitalisation can increase institutional reach and reusability while simultaneously introducing new forms of depreciation and systemic risk.

12. Scope Conditions, Limitations and Alternative Explanations

Institutional capital is neither necessary in identical form across all contexts nor sufficient for development. Geography, conflict, political settlements, external shocks, market structure, macroeconomic policy and global financial conditions also shape outcomes. The theory should therefore be understood as a partial framework rather than a complete theory of development.

The theory is normatively neutral at the level of capability. Capable institutions may be deployed toward inclusive, extractive, democratic or authoritarian objectives. Productive capacity and legitimate purpose are analytically distinct. Governance, rights and accountability remain essential for evaluating how institutional capital is used.

The framework may be less applicable where institutional capabilities are highly personal, temporary or dependent on individual leaders rather than durable organisations and routines. It may also be difficult to distinguish institutional capital from social capital, where trust and informal coordination substitute for formal systems. Such cases should be treated as scope conditions rather than forced into a universal index.

Alternative explanations must be taken seriously. Apparent institutional-capital effects may reflect income, education, political stability, colonial administrative legacies, resource endowments or broader governance quality. The empirical design must therefore test whether the stock-based framework adds explanatory or predictive value after these factors are taken into account.

The theory should be revised or rejected if institutional capital cannot be distinguished empirically from governance or state capacity; if stock, accumulation and depreciation dynamics cannot be demonstrated; if proposed transmission mechanisms consistently fail; or if institutional-capital measures provide no incremental explanatory value.

13. Policy Implications and Research Agenda

13.1 Public investment appraisal

Governments should distinguish recurrent administrative consumption from expenditure that creates durable, productive institutional assets. This does not imply capitalising all reform spending in public accounts. It implies evaluating selected institutional investments with longer time horizons, maintenance requirements, cross-sectoral benefits and expected returns.

13.2 Ministries of finance and development institutions

Ministries of finance could incorporate institutional-asset diagnostics into public investment management, fiscal risk analysis, and medium-term expenditure frameworks. Development finance institutions and multilateral development banks could assess whether projects build interoperable and maintainable institutional assets rather than isolated systems. Financing design should include lifecycle costs, local ownership, standards, skills and maintenance.

13.3 Digital public infrastructure

Digital public infrastructure offers a particularly visible application. Identity, payments and data-exchange systems may create cross-sectoral institutional assets, but only when they are inclusive, secure, interoperable, legally grounded and sustainably governed. The capital framework discourages treating DPI as a collection of technology procurements and emphasises the institutional conditions that make the assets productive.

13.4 Africa as a principal application

The theory is universal, but African economies provide an important field of application. Many countries are simultaneously expanding digital identity, tax administration, payment infrastructure, social registries, regional trade systems, climate information platforms and public financial management. A capital perspective allows these initiatives to be analysed as components of institutional accumulation rather than as disconnected reforms. It also highlights the risks of externally financed fragmentation, pilot dependence and underfunded maintenance.

13.5 Research agenda

The foundational paper should be followed by separate empirical studies rather than being enlarged indefinitely. Priority studies include the construction and validation of an Institutional Capital Index; institutional capital and sovereign risk; institutional capital and digital public infrastructure; institutional capital and domestic resource mobilisation; institutional capital and resilience; and comparative studies of appreciation and depreciation following major reforms or disruptions.

14. Conclusion

This paper has advanced a simple but consequential proposition: certain institutional capabilities should be analysed as productive capital.

The theory defines institutional capital as the accumulated stock of durable and operational institutional assets that enhances a society's capacity to organise, coordinate, regulate and generate economic and public value over time. These assets are created through investment, become productive through operational integration, and may appreciate through learning, interoperability, data accumulation, network effects and trust. They may depreciate through fragmentation, obsolescence, poor maintenance, capability erosion and declining legitimacy.

The framework distinguishes the stock from its related concepts. Institutional assets are the building blocks of the institution. Institutional capability is what the accumulated stock enables institutions to do. Institutional productivity concerns the efficiency with which capability is converted into value. Institutional investment is the flow of resources devoted to creating, integrating and maintaining the assets.

This distinction matters because Institutional Capital Theory does not merely restate the proposition that institutions influence development. It makes a narrower and testable claim: some institutional capabilities possess the economic characteristics of capital. They require investment, persist, accumulate, complement other productive assets, generate future returns and exhibit appreciation and depreciation dynamics.

The theory's credibility will depend on empirical evidence. Its decisive test is whether institutional-capital measures can be distinguished from governance and state capacity and whether they add explanatory power. Failure on those tests would require revision or rejection. Success would justify incorporating institutional accumulation more explicitly into development analysis, public investment appraisal and institutional reform.

The digital century makes this inquiry urgent. Digital systems have increased the durability, reusability, interoperability and cross-sectoral reach of institutional assets, while also making clear that technology without institutions does not create productive capability. Systems become institutional capital only when embedded in functioning organisations, legal authority, operating routines, human competence, sustainable governance and public trust.

Development depends not only on the resources a society possesses but also on the institutional assets through which those resources are organised and made productive. Roads, skills, finance, data, technology and natural resources do not generate their full value independently of the systems that coordinate them. The Institutional Capital Theorem states the consequence precisely: because outcomes follow from the services an institutional stock delivers rather than from the expenditure intended to build it, two states may spend alike, legislate alike and score alike on governance, and still diverge persistently — and that divergence is observable in conversion efficiency, depreciation and the productivity of deployment. Whether the proposition survives contact with evidence is now an empirical question, and this paper has specified the tests that would settle it.

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