

## **Can Econometrics Explain Development? A Theoretical Critique And Contextual Reassessment Of Econometric Validity In Development Research**

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**Abstract:** *Econometrics, particularly Ordinary Least Squares (OLS) models, has long dominated development economics research, offering quantitative insights into growth, poverty, and institutional dynamics. However, its explanatory power is increasingly questioned in contexts characterized by weak institutions, informal economies, and complex socio-cultural dynamics. Grounded in institutional theory, political economy, and complexity perspectives, this study examines the contextual validity of econometrics in explaining development outcomes. Drawing on secondary sources including scholarly articles, books, and policy reports, the study employs content and thematic analysis to synthesize empirical and theoretical literature. Findings indicate that econometric models often fail due to unreliable data, omitted institutional variables, endogeneity caused by structural informality, and non-linear interactions among economic, political, and social factors. Moreover, existing literature has predominantly focused on technical issues such as heteroscedasticity and multicollinearity, leaving a gap in understanding the epistemic and contextual limitations of quantitative approaches and the potential for qualitative complementarity. The study argues that while econometrics is valuable for pattern detection and predictive inference, it is insufficient alone to capture the multidimensional and path-dependent nature of development. It advocates for methodological pluralism, integrating qualitative triangulation, institutional context analysis, and complexity-informed frameworks to enhance explanatory validity. By explicitly linking theory and context, this study contributes a critical and nuanced understanding of development processes, bridging the gap between statistical inference and socio-political realities. In doing so, it advances development economics by offering a theoretically integrated critique of econometric epistemology and proposing methodological pluralism as a more context-sensitive and explanatory framework for analysing development outcomes in heterogeneous institutional environments.*

**Keywords:** *Econometrics, Development, Contextual Validity, Institutions, Methodological Pluralism*

### **INTRODUCTION**

The question of whether econometrics can adequately explain development has long animated scholarly debates within development economics. Since the mid-twentieth century, econometric modelling particularly Ordinary Least Squares (OLS) regressions has occupied a dominant position in empirical development research, functioning as the preferred tool for identifying causal relationships, forecasting economic trends, and evaluating policy impacts (Banerjee & Duflo, 2019; Wooldridge, 2020). This historical dominance is rooted in the discipline's aspiration to adopt the methodological rigor of the natural sciences, where statistical

inference is taken as a marker of objectivity and empirical credibility. Over time, cross-country growth regressions, poverty elasticity models, and structural equation estimates became the conventional architecture through which development processes were understood and policy recommendations justified (Rodrik, 2008; Datt & Ravallion, 2022).

However, the persistent reliance on econometrics has generated critical concerns regarding the contextual validity of statistical models when applied to highly heterogeneous development environments. A growing body of scholarship argues that econometric techniques, while powerful, often assume linearity, parameter stability, institutional exogeneity, and cross-context comparability—assumptions that frequently fail in real-world development settings characterized by institutional fluidity, cultural complexity, and political contestation (Pritchett, 2022; Sen, 2021). These mismatches call into question the degree to which econometric outputs reflect genuine causal structures rather than artefacts of model specification. Consequently, the expectation that econometric evidence can universally explain development outcomes has become increasingly contested, especially as contemporary development challenges reveal the limitations of purely statistical abstractions.

The issue is further complicated by the argument that econometric models tend to privilege measurable variables while marginalizing qualitative dimensions that critically shape development trajectories—such as informal norms, political bargaining, social cohesion, power relations, and historical legacies (North et al., 2009; Mazzucato, 2021). These elements, though difficult to quantify, substantially influence policy effectiveness and economic performance. As a result, econometric analyses often underperform in contexts where development processes are driven by deeply embedded institutional and socio-political dynamics that escape conventional datasets and modelling frameworks.

These epistemological tensions raise fundamental questions about the adequacy of econometrics as a standalone explanatory tool for development. The present inquiry therefore addresses the following research questions:

1. Can econometrics alone adequately explain development outcomes?
2. What contextual factors reduce the validity of econometric results in development research?

3. How can qualitative or mixed-methods approaches complement and strengthen the limitations of econometric analysis?

The purpose of this study is to offer a theoretically grounded critique of econometrics in development analysis and to advance a call for methodological pluralism. The paper argues that while econometrics remains indispensable, its explanatory power is constrained in environments characterized by structural heterogeneity and institutional complexity. A theoretically informed integration of econometric and qualitative approaches is therefore essential for enhancing methodological robustness, analytical depth, and contextual realism.

### ***Research Gap and Contribution***

Despite the widespread application of econometric methods in development research, limited studies have systematically examined their epistemological foundations and contextual validity. Much of the existing literature remains preoccupied with technical econometric challenges—such as heteroscedasticity, multicollinearity, and endogeneity—while paying insufficient attention to the broader institutional, political, and socio-cultural contexts that shape development outcomes and condition the explanatory power of statistical models. Consequently, there exists a critical gap in understanding how the assumptions underlying econometric reasoning interact with complex development realities. This study addresses this gap by providing a theoretically integrated critique of econometric epistemology and advancing methodological pluralism as an alternative analytical framework. In doing so, it contributes to development economics by offering a more context-sensitive, institutionally grounded, and epistemologically robust approach to explaining development processes and informing policy design.

### ***Statement of the Problem***

Existing development research is rich in econometric models that estimate the determinants of growth, poverty, inequality, and institutional performance. Yet, much of what is known remains shaped by models that assume parameter stability, structural homogeneity, and universal quantifiability. What remains insufficiently understood is how contextual realities—informal institutions, governance quality, sociocultural norms, and political power—interact with economic variables in ways that systematically undermine the assumptions of classical econometric techniques (Pritchett, 2022). There is therefore a need for a theoretical interrogation of the

epistemic limits of econometric reasoning when applied to complex development environments, alongside the articulation of complementary analytical frameworks capable of capturing multidimensional socio-economic realities. This gap is significant because development policies derived from context-insensitive models risk being ineffective, misdirected, or counterproductive. Accordingly, this study is justified by the need to rethink methodological practices in development economics and to emphasize approaches that enhance explanatory depth, contextual validity, and policy relevance.

### ***Objectives of the Study***

In line with the stated problem and theoretical orientation, the study pursues the following objectives:

1. To examine the extent to which econometric methods can adequately explain development outcomes.
2. To identify contextual factors—institutional, cultural, political, and historical—that undermine econometric validity in development settings.
3. To explore how qualitative and mixed-methods approaches can complement econometric limitations and improve explanatory depth.
4. To provide a theoretical justification for methodological pluralism as a more context-sensitive framework for development research.

### **Conceptual Clarifications**

***Econometrics:*** Econometrics is broadly defined as the application of statistical and mathematical techniques to the analysis of economic phenomena, with the aim of testing theories, estimating relationships, and informing policy decisions (Wooldridge, 2020; Angrist & Pischke, 2019). It combines economic theory, data, and statistical inference to generate quantitative insights into causal relationships. In development economics, econometric methods—particularly Ordinary Least Squares (OLS) regressions—have historically dominated empirical research due to their ability to provide consistent and efficient parameter estimates under certain assumptions (Gujarati & Porter, 2020). However, econometrics is inherently context-sensitive, meaning that its validity depends on the extent to which assumptions such as linearity, exogeneity, homoskedasticity, and accurate measurement are satisfied in the environment under study (Wooldridge, 2020).

**Contextual Validity:** Contextual validity refers to the degree to which a model, analytical method, or research finding accurately reflects the specific conditions and complexities of the environment in which it is applied (Pritchett, 2022; Sen, 2021). In development research, this entails accounting for historical, institutional, cultural, political, and socio-economic factors that shape economic outcomes. A model with high statistical accuracy in one context may perform poorly in another if these local realities are not adequately incorporated. Thus, contextual validity emphasizes the need for analytical frameworks that are sensitive to the multi-dimensional, path-dependent, and non-linear nature of development processes.

**Development Explanation:** Development explanation refers to the articulation of causal mechanisms, pathways, and conditions that underpin economic, social, and human development (Rodrik, 2022; Acemoglu & Robinson, 2019). Beyond the measurement of growth rates or poverty indices, it seeks to understand why particular policies, institutions, or interventions succeed or fail in producing desired outcomes. A robust development explanation integrates both quantitative and qualitative dimensions, recognising that social, political, and institutional factors are not always reducible to numerical data.

**Epistemic Limitations:** Epistemic limitations of econometrics concern the boundaries of knowledge generated by statistical models (Pritchett, 2022; Wooldridge, 2020). These limitations arise from data inadequacies, model misspecification, omitted variable bias, measurement error, and the inability of models to fully capture informal institutions, power relations, or socio-cultural norms. In development economics, these limitations imply that econometric evidence alone cannot fully explain complex development processes and outcomes.

**Predictive Accuracy vs. Explanatory Validity:** A key distinction in development research is between predictive accuracy and explanatory validity. Predictive accuracy refers to a model's ability to forecast or replicate observed outcomes reliably (Angrist & Pischke, 2019). Explanatory validity, on the other hand, relates to a model's capacity to illuminate the underlying causal mechanisms or theoretical relationships that produce the outcomes (Pritchett, 2022). A model may achieve high predictive accuracy in a given dataset yet fail to provide genuine causal insight if contextual factors or structural complexities are ignored. In the context of development economics,

this distinction underscores the importance of complementing econometric methods with qualitative and context-sensitive approaches that enhance theoretical understanding.

### **Theoretical Literature Review**

*Epistemological Foundations of Econometrics:* Econometric analysis is deeply rooted in a positivist epistemology, assuming that economic phenomena can be represented as regular, quantifiable relationships amenable to statistical measurement. The standard tools—particularly Ordinary Least Squares (OLS)—rely on assumptions such as linearity, normality, exogeneity, and rational individual behaviour (Errouaki, 2014). These assumptions reflect a worldview that economic agents optimize under stable conditions, and that deviations from equilibrium are merely stochastic noise. Under OLS, inference is correlation-based: econometricians estimate coefficients that minimize residual variance under the presumption that regressors are exogenous and correctly specified (Gujarati & Porter, 2020). While this framework has been tremendously successful in applied work, its epistemic foundation may limit its capacity to uncover deeper causal structures, particularly in contexts where economic behaviour is shaped by institutions, informal norms, or structural constraints (Errouaki, 2014).

*Complexity and Non-Linearity in Development:* By contrast, development processes often exhibit properties of complex adaptive systems: path dependence, emergence, non-linear dynamics, and feedback effects. Economic development is not merely the summation of independent micro-decisions; rather, it is shaped by the co-evolution of institutions, firms, technologies, and social norms. Paniagua (2023) argues that conventional macroeconomic models, grounded in reductionist assumptions, struggle to capture the emergent causality intrinsic to organized complexity. When development is seen through this lens, the standard econometric assumptions begin to break down: variables may interact in non-linear ways, causal effects may be state-dependent, and structural changes may not conform to the linear, symmetric relationships imposed by OLS. Empirical violations such as endogeneity, measurement error, omitted institutional variables, and regime shifts (e.g., political or institutional turning points) become more than technical nuisances — they challenge the very validity of the model (Paniagua, 2023).

### **Theoretical Arguments against Sole Reliance on Econometrics**

#### ***Institutional Economics: Context Matters***

Institutional economists have long emphasised that context – historical, cultural, political – shapes economic outcomes in ways that statistical models may not adequately account for. The “rules of the game” (formal and informal) influence transaction costs, trust, coordination, and opportunity structures, and their effects cannot always be reduced to exogenous covariates. Moreover, as scholars of institutional variety argue, development cannot be understood through a one-size-fits-all institutional template: different institutional constellations may coexist, and their causal influence may be contingent (Hodgson & evolutionary institutionalists in institutional variety literature; institutional variety analysis has normative and structural implications) (institutional variety literature; see also Review of Evolutionary Political Economy, 2020).

### ***Political Economy: Power Relations Cannot Be Fully Quantified***

Political economy perspectives foreground power, conflict, and elite dynamics — features that are difficult to fully encapsulate in regression models. Incentives for reform, rent-seeking behaviour, and elite capture often distort incentive structures, leading to institutional outcomes that resist simple parametrization. Econometrics may capture associations (for instance, between corruption indices and growth), but it struggles to unpack the mechanisms of agency, bargaining, or resistance, especially when data on informal networks or clientelist ties are missing (Lari, 2024).

### ***Human Development School: Qualitative Dimensions (Capabilities, Freedoms)***

From a human development standpoint, what matters is not only economic growth, but also the expansion of people’s capabilities, freedoms, and agency. These dimensions often evade quantification: well-being encompasses norms, aspirations, social inclusion, and non-market interactions. While econometric indicators can proxy for certain outcomes (e.g., education, health), they may fail to reflect qualitative changes in freedom, empowerment, or social relations. In such contexts, rich, qualitative narrative and normative analysis provide indispensable insight.

### ***Arguments Supporting Econometrics (for Balance)***

Despite these critiques, econometrics retains valuable strengths. First, its predictive usefulness is undeniable: well-specified regression models can forecast outcomes, identify strong correlates, and provide probabilistic estimates that guide policy (Angrist & Pischke, 2019). Second, econometric analysis excels at pattern detection: across large cross-country or panel datasets, it can uncover robust associations (e.g., between institutional quality and growth) that

would be difficult to observe otherwise. Third, econometric methods remain highly useful when embedded within mixed-methods frameworks: by combining quantitative with qualitative insights, researchers can triangulate findings, validate causal mechanisms, and enrich interpretation. In this way, econometrics serves as a powerful component — though not the whole — of a pluralistic methodological toolkit.

### **Empirical Literature Review: Qualitative Synthesis**

Empirical critiques of econometric models in development economics highlight recurrent patterns of failure rooted in data quality issues, weak institutional environments, pervasive informality, and unquantifiable cultural contexts. These problems often undermine the explanatory power of quantitative models and point to the need for more context-sensitive analytical approaches.

#### ***Data Quality Issues***

One of the most fundamental challenges in applying econometric models to development problems is the poor quality of data. In many African contexts, statistical systems lack the capacity, consistency, and coverage required for reliable inference. Asongu and Nwachukwu (in Pelizzo & Kinyondo, 2018) argue that low data quality on corruption, governance, and other key institutional variables not only impedes sound empirical analysis, but also constrains policy-relevant knowledge creation. The absence of reliable time series and the prevalence of measurement error in official indicators can bias econometric estimates, leading to spurious correlations or attenuated effect sizes. Further complicating matters, data-sharing frameworks in Africa often reflect power asymmetries and extractive practices rooted in colonial legacies, which distort the representativeness and integrity of datasets (Abebe, Aruleba, Birhane, & Obaido, 2021). These structural deficiencies challenge the very validity of regression-based inferences, especially when operationalizing concepts like institutional quality, poverty, or corruption.

#### ***Weak Institutions***

Weak institutions such as deficient rule of law, low bureaucratic capacity, and corruption further limit the reliability of econometric modeling. Empirical studies suggest that when institutions are weak, the relationships econometricians try to estimate may be unstable, non-linear, or context-dependent. For instance, a recent study of macroeconomic productivity in Sub-Saharan

Africa found that institutional quality, measured through governance indices, is positively associated with productivity but with varying strength depending on colonial legacy and governance regime (Discover Global Society, 2025). These findings underscore that institutional heterogeneity and omitted variable bias (where unobserved informal institutions matter) complicate the estimation of causal effects, especially when models assume stationarity and homogeneity across countries.

Similarly, in financial and development research, evidence shows that corruption's impact is non-linear and conditioned by the strength of public institutions. A 2025 study applied regression-tree analysis to capture how corruption interacts with governance quality, finding that the effects of corruption on growth differ significantly depending on institutional strength (Beyaert, 2023). Such non-linearities and context-dependencies are poorly captured in standard linear regressions, raising concerns about the external validity of conventional econometric inference.

### ***Informal Economic Activities***

The presence of large informal economies in many developing countries poses a serious empirical challenge. Informality escapes formal regulation, tax systems, and official economic statistics, thereby undermining the accuracy of models that rely on formal data. Osinubi and Simatele (2025) investigated how the informal economy and institutional quality jointly influence socioeconomic conditions in 35 African countries. Their study used dynamic panel techniques to demonstrate that informality significantly worsens socioeconomic outcomes, while institutional quality (e.g., corruption control, government stability) matters only beyond a certain threshold. This nuanced, threshold-based relationship suggests that linear econometric models may understate or distort the negative effects of informality when institutional quality is weak.

In a related context, the informal business sector's influence on productivity has been documented at firm-level. Using data from small and medium enterprises in Cameroon, Tsafack, Cheng, and Providence (2022) found that informal firms suffer from low productivity due to poor access to finance, low technological adoption, and weak institutional support. These qualitative realities — such as unregistered firms, cash-based transactions, and minimal formal governance

— challenge the assumptions of complete observability and measurement that econometric models typically rely upon.

### ***Cultural Factors and Contextual Bias***

Cultural, social, and historical factors that shape development often resist quantification, but they significantly influence economic and institutional behavior. Timcke (2020) critiques econometric methodologies for reducing complex political and social disputes into technical statistical problems. He argues that when social rules, norms, and power relations are translated into narrow indicators, econometric models risk depoliticizing conflict and misrepresenting causality. Anthropological or qualitative accounts thus remain indispensable for capturing political contestation, local practices, and emergent institutional forms that lie beyond standardized cross-national measures.

Furthermore, the practice of econometric targeting in poverty programs has been empirically problematic. Brown, Ravallion, and van de Walle (2016) examined the use of proxy-means tests (PMTs) for poverty targeting in African countries, showing that these econometric tools frequently misidentify the poor, particularly at low coverage levels, because the targeting formulae are opaque, too complex, or poorly understood by local populations. This misidentification reflects not only data limitations but a deeper epistemic mismatch: the statistical models may not align with how poverty is experienced or socially constructed in different communities.

### ***Mis-Explanation of Poverty, Inequality, Corruption, and Growth***

Econometric models have also been critiqued for mis-explaining critical development outcomes. One prominent case is corruption. While econometric studies often find negative relationships between corruption and growth, meta-analyses (e.g., Campos, 2016) reveal substantial heterogeneity across studies: whether corruption “sands” or “greases” the wheels of growth depends significantly on institutional context, measurement choice, and model specification. In contexts with very weak institutions, linear regression models may underplay the distributive, power-laden mechanisms through which corruption operates.

In another vein, qualitative political economy research emphasizes that clientelism, patronage, and informal bargaining processes shape development in ways that econometric models struggle to capture. For instance, clientelistic linkages often determine how public resources are

allocated and how policies are implemented, yet such dynamics are rarely represented in cross-country regressions or macro panel data.

Finally, standard econometric measures of income or poverty may mask important social dimensions. Qualitative poverty studies show that “being poor” is not just about income shortfall but involves lack of agency, exclusion, and vulnerability (Jones, 2019). When development programs rely on econometric indicators of poverty, they risk flattening the lived experiences of marginalized groups and misdirecting policy interventions.

### ***Synthesis and Implications***

This qualitative synthesis of empirical literature reveals that econometric models in development economics often fail or mis-explain because of structural data limitations, institutional fragility, informal sectors, and unquantifiable cultural dimensions. These critiques do not invalidate econometrics altogether, but they underscore its epistemic limits in development contexts. They point to the necessity of integrating qualitative and mixed-methods research, narrative-driven analysis, and local knowledge to complement statistical inference. In doing so, development research can better capture the complex, context-dependent processes that shape economic outcomes and policy effectiveness.

## **METHOD**

### **Research Design**

The study adopts a qualitative, library-based theoretical research design. This design is particularly suitable for interrogating the epistemological foundations and contextual limitations of econometric methods in development analysis, especially in settings characterized by institutional complexity, socio-political heterogeneity, and structural informality. Rather than relying on numerical estimation, the approach emphasizes critical theoretical reasoning, interpretive synthesis, and conceptual integration of existing scholarship. This enables a deeper examination of methodological assumptions, explanatory boundaries, and alternative analytical paradigms, thereby enhancing conceptual rigor and analytical depth.

### **Literature Selection Criteria and Data Sources**

The study relies exclusively on secondary data drawn from peer-reviewed journal articles, scholarly books, policy reports, and institutional publications produced by reputable academic and development organizations. Sources were systematically selected based on four key criteria: (i) relevance to econometrics, development economics, institutional theory, political economy, and complexity perspectives; (ii) theoretical contribution and conceptual depth; (iii) methodological rigor; and (iv) publication in high-quality outlets indexed in major academic databases such as Scopus, Web of Science, and Google Scholar. Priority was given to seminal works and recent high-impact studies to ensure both foundational grounding and contemporary relevance.

To maintain analytical rigor, materials excluded from the review included non-scholarly opinion pieces, duplicated studies, documents lacking methodological clarity, publications without peer-review validation, and sources with limited conceptual relevance to the study's objectives. This systematic screening process ensured the inclusion of authoritative, analytically robust, and contextually relevant literature capable of supporting rigorous theoretical inquiry.

### **Analytical Framework and Method of Data Analysis**

Data analysis was conducted using qualitative document analysis, integrating content coding and thematic synthesis. The analytical process followed Braun and Clarke's (2006) thematic analysis framework, which involves six systematic stages: familiarization with the data, generation of initial codes, identification of emerging themes, theme refinement and review, thematic definition and labeling, and interpretive synthesis.

First, iterative reading facilitated immersion in the literature and the identification of explicit and implicit references to econometric assumptions, institutional constraints, socio-political dynamics, and epistemological debates. Second, inductively generated codes were applied to relevant text segments to capture recurring patterns and conceptual linkages. These codes were subsequently organized into broader analytical themes, including institutional complexity, structural informality, political mediation, epistemic limitations, and methodological pluralism. Finally, interpretive synthesis enabled cross-source comparison and conceptual integration, allowing the study to uncover recurring explanatory gaps, theoretical tensions, and methodological contradictions in the development economics literature.

### **Validity Strategy and Analytical Rigor**

To enhance analytical rigor and conceptual validity, the study employed theoretical triangulation across institutional theory, political economy, and complexity perspectives. This triangulated analytical strategy strengthened interpretive credibility by enabling cross-validation of findings through multiple theoretical lenses, reducing interpretive bias, and deepening explanatory robustness. By systematically integrating these perspectives, the study ensures a more holistic understanding of development processes and mitigates the limitations associated with mono-theoretical or methodologically reductionist approaches.

### **Scope and Limitations**

The study is limited to a theoretical and conceptual examination of econometric methodology within development research and does not involve primary data collection or econometric modeling. Consequently, it does not generate empirical parameter estimates or statistical generalizations. However, by employing rigorous document analysis, thematic synthesis, and theoretical triangulation, the study provides a robust epistemological critique of econometric reasoning and offers a strong conceptual foundation for advancing methodological pluralism. This approach contributes substantively to scholarly discourse by illuminating the methodological boundaries of econometrics and highlighting alternative analytical pathways for context-sensitive development research.

## **RESULT AND DISCUSSION**

This section critically examines the limitations of econometric modelling—particularly Ordinary Least Squares (OLS)—in explaining development outcomes within heterogeneous institutional, political, and socio-economic contexts. Drawing on institutional theory, political economy, and complexity perspectives, the analysis is organized into five interrelated thematic dimensions: institutional limitations, informal economy constraints, political economy dynamics, complexity and non-linear processes, and implications for methodological pluralism.

### **Institutional Limitations of Econometrics**

Development contexts, especially in low- and middle-income countries, are frequently characterized by weak institutional capacity, fragile governance structures, and underdeveloped statistical systems. These conditions result in unreliable data collection, incomplete economic

registries, and inconsistent administrative reporting (Abebe et al., 2021; Osinubi & Simatele, 2025). In such settings, econometric models suffer from substantial measurement error, missing data, and sampling biases, which undermine the reliability and robustness of OLS estimates.

Weak institutions also constrain the accuracy of macroeconomic indicators such as GDP, employment, poverty, and fiscal performance. Informal economic activities, poor civil registration systems, and limited monitoring mechanisms further compromise data validity. As a result, econometric estimations based on such datasets may produce statistically significant results that mask deep structural distortions, leading to misleading causal interpretations and fragile policy recommendations.

### **Informal Economy and Measurement Constraints**

A defining feature of many developing economies is the dominance of informal economic activity, encompassing unregistered enterprises, cash-based transactions, subsistence production, and non-contractual labour relations. These activities remain largely invisible within official datasets, creating substantial endogeneity and omitted variable bias in econometric models (Tsafack et al., 2022). The absence of reliable data on informal production and employment distorts estimated relationships between policy interventions and development outcomes.

Structural informality introduces simultaneity and reverse causality problems, as economic behaviour and institutional responses co-evolve in dynamic feedback loops. Standard OLS techniques, which assume exogeneity of regressors, are ill-equipped to account for these interactions. Consequently, regression outputs may misrepresent the magnitude, direction, and stability of policy effects, thereby limiting the explanatory power of econometric inference in development research.

### **Political Economy and Power Dynamics**

Beyond technical limitations, political economy dynamics significantly shape development trajectories and institutional performance. Power asymmetries, elite capture, rent-seeking behaviour, and political bargaining processes systematically influence policy formulation, resource allocation, and regulatory enforcement (Acemoglu & Robinson, 2019; Pritchett, 2022). These dynamics often operate through informal and opaque mechanisms that escape conventional statistical modelling.

OLS regressions typically abstract from these political and institutional realities, treating governance indicators and institutional quality as exogenous variables. However, political processes are deeply endogenous, shaped by historical legacies, social coalitions, and distributive conflicts. Ignoring these dimensions risks producing models that are statistically robust yet analytically shallow, failing to capture the causal pathways through which political power structures shape development outcomes.

### **Complexity and Non-linear Development Processes**

Development is inherently a complex, adaptive, and non-linear process characterized by path dependence, feedback loops, threshold effects, and emergent outcomes. Poverty reduction, institutional reform, and structural transformation rarely follow linear trajectories but instead evolve through intricate interactions among economic, political, social, and environmental systems (Paniagua, 2023).

Conventional econometric models, grounded in linear functional forms and equilibrium assumptions, struggle to capture these dynamics. Non-linear interactions, multiplicative effects, and institutional tipping points often remain unobserved, leading to oversimplified representations of causality. Consequently, econometric analyses may generate incomplete or misleading inferences, particularly when applied to development contexts marked by volatility, uncertainty, and institutional flux.

### **Implications for Methodological Pluralism**

Given these limitations, there is a compelling case for methodological pluralism in development research. Integrating qualitative approaches with quantitative analysis enhances explanatory depth, contextual sensitivity, and analytical robustness (Creswell & Poth, 2018). Qualitative methods—such as institutional analysis, historical inquiry, case studies, and ethnographic research—enable scholars to uncover causal mechanisms, social meanings, and power relations that remain invisible to econometric models.

Context-sensitive theoretical frameworks rooted in institutional economics, capability theory, and complexity science further strengthen development analysis (Sen, 1999; Alkire, 2005; Paniagua, 2023). These approaches recognize development as a multidimensional, relational, and emergent process shaped by social agency, institutional structures, and dynamic interactions. By

embedding econometric techniques within broader analytical architectures, development research can achieve greater conceptual coherence and policy relevance.

### **Synthesis and Conceptual Integration**

These findings demonstrate that econometrics, while valuable for identifying patterns and correlations, cannot fully explain development outcomes without incorporating institutional, political, and qualitative dimensions. The limitations associated with weak institutions, pervasive informality, political power asymmetries, and complex non-linear interactions fundamentally constrain the explanatory reach of OLS-based models. Methodological pluralism therefore emerges not merely as a supplementary strategy but as a conceptual necessity for achieving deeper understanding, analytical validity, and effective policy design in development economics.

### **CONCLUSION**

Econometric methods, particularly OLS-based regression models, remain valuable tools for detecting patterns, estimating associations, and providing quantitative evidence in development economics. However, as this study has demonstrated, econometrics alone is insufficient to fully explain development outcomes. The complexity of development—characterized by non-linear interactions, institutional heterogeneity, informal economic activities, political contestation, and socio-cultural dynamics—frequently violates the foundational assumptions of conventional econometric models, thereby limiting both their predictive accuracy and explanatory validity (Timcke, 2020; Paniagua, 2023).

By prioritizing statistical rigor while underemphasizing contextual, institutional, and qualitative dimensions, dominant econometric approaches risk oversimplifying causal mechanisms and generating policy prescriptions that are analytically incomplete or practically ineffective. The study therefore underscores the necessity of a pluralistic methodological orientation that integrates econometric analysis with institutional, political economy, and complexity-informed perspectives. Such an integrative approach enhances conceptual coherence, deepens causal understanding, and improves the relevance of development research for policy formulation and implementation.

### ***Contribution of the Study***

This study contributes to development economics by offering a context-sensitive and theoretically integrated critique of econometric epistemology, highlighting the conceptual and methodological boundaries of OLS-based modeling in heterogeneous development environments. It advances methodological pluralism as a robust analytical framework capable of improving explanatory validity, interpretive depth, and policy relevance. By bridging statistical inference with institutional, political, and qualitative analysis, the study enriches contemporary methodological debates and provides a conceptual foundation for more nuanced, realistic, and impactful development research.

### ***Future Research Directions***

Future research should empirically examine pluralistic methodological frameworks that integrate econometric analysis with qualitative, institutional, and complexity-based approaches. Comparative case studies, mixed-method designs, and longitudinal institutional analyses could provide deeper insights into how contextual dynamics shape development trajectories across diverse settings. Additionally, researchers should explore innovative analytical tools—such as system dynamics modeling, agent-based simulations, and participatory qualitative inquiry—to better capture non-linear interactions, feedback mechanisms, and emergent outcomes. Such efforts would further strengthen methodological rigor, deepen causal understanding, and enhance the policy relevance of development economics scholarship.

### **Recommendations**

#### ***Theoretical Re-evaluation of Methods***

Development economists should critically interrogate the epistemological assumptions underpinning econometric models, recognizing their limitations in capturing context-specific, institutional, and socio-political dynamics (Pritchett, 2022; Lari, 2024). Greater integration of insights from institutional economics, political economy, human development, and complexity theory is essential for enhancing conceptual realism.

#### ***Qualitative Triangulation***

Complementary qualitative approaches—including case studies, ethnographic research, historical analysis, and institutional diagnostics—should be systematically incorporated alongside

econometric techniques to triangulate findings and strengthen explanatory depth (Creswell & Poth, 2018).

### ***Institutional Context Analysis***

Empirical investigations should explicitly account for the role of formal and informal institutions, governance quality, social norms, and political power structures in shaping development outcomes (Acemoglu & Robinson, 2019; Sen, 1999). Embedding these dimensions can mitigate omitted variable bias and enhance contextual validity.

### ***Adoption of Complexity Frameworks***

Researchers should increasingly adopt complexity-informed analytical frameworks that accommodate non-linear interactions, path dependence, and emergent phenomena. Such approaches can better reflect the dynamic, adaptive, and interconnected nature of development processes (Paniagua, 2023).

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