Letters in Economic Research Updates ISSN: 3068-9236

PRIME OPEN ACCESS

Volume 2, Issue 3

Research Article

Date of Submission: 03 Jan, 2026
Date of Acceptance: 29 June, 2026
Date of Publication: 06 July, 2026

When the Stock Market Shapes the Economy: Effects of Market Capitalization on Economic Complexity in Developing Countries

Michel Wilfried Zanga Mbarga[1*] and Dieudonné Mignamissi[2]

[1]PhD Candidate, Catholic University of Central Africa, Department of Continuing Education, Deposits and Consignments Fund of Cameroon, Cameroon

[2]Associate Professor, University of Yaoundé II, Faculty of Economics, Cameroon

***Corresponding Author:**
Michel Wilfried Zanga Mbarga, Catholic University of Central Africa, Department of Continuing Education, Deposits and Consignments Fund of Cameroon, Cameroon.

Citation: Zanga Mbarga, M. W., Mignamissi, D. (2026). When the Stock Market Shapes the Economy: Effects of Market Capitalization on Economic Complexity in Developing Countries. *Lett Econ Res Updates, 2*(3), 01-25.

Abstract
The interaction between market capitalization and economic complexity in emerging and developing countries (EDCs) has been identified as a key factor in the pursuit of sustainable economic growth. The objective of this paper is to explore the effects of market capitalization on economic complexity in 65 EDCs, over the period 1995-2023. More specifically, the study examines how market capitalization influences the Economic Complexity Index (ECI). After applying the Generalized Method of Moments (GMM) and various robustness tests, the results show that market capitalization has a positive and significant impact on economic complexity. These results translate into diversification of production structures, innovation, and the shift towards more technologically sophisticated sectors. However, the effect is contingent upon the institutional, socio-cultural, and economic context of the countries: countries with strong institutions and a stable macro-financial environment benefit more from this dynamic, while the effect is mitigated in economies dependent on natural resources or characterized by high social fragmentation. Based on these findings, economic policy recommendations are proposed, including strengthening the institutional framework, effectively regulating financial markets, promoting capital allocation towards high-value-added sectors, and developing human capital.

Keywords: Market Capitalization, Economic Complexity, Developing Countries, Global Markets, Economic Innovation

Introduction
The limitations of traditional macroeconomic indicators and the emergence of approaches focused on productive structure, institutional quality, and the learning capacity of economies have significantly transformed the analysis of economic development in developing countries over the past 20 years. Long considered the ultimate goal of progress, GDP growth has failed to explain the different paths taken by countries with similar macroeconomic outcomes. Aware of this, researchers and policymakers have turned their attention to structural transformation, defined as the gradual reallocation of resources toward more productive, knowledge-intensive, and value-added activities [1,2].

In this context, the development of financial systems, particularly stock markets, is attracting renewed interest. Market capitalization, which represents the total value of traded assets relative to the size of the economy, is a key indicator of the depth of the financial system and the capacity of markets to mobilize and allocate long-term capital. Beyond its purely financial aspect, it is increasingly seen as a mechanism capable of supporting innovation, the growth of productive enterprises, and industrial expansion [3,4]. However, in developing countries, where stock markets are still often closed, unstable, and controlled by a small number of large companies, the fundamental question is whether they

effectively contribute to productive transformation rather than simply financializing the economy.

At the same time, the economic complexity approach has emerged as an essential analytical framework for understanding the structural foundations of the system. Economic complexity refers to the set of productive, technological, and organizational capacities that a country can mobilize to produce and export a diverse range of sophisticated goods. Measured by the Economic Complexity Index (ECI), it is now recognized as a powerful indicator of long-term economic growth, economic resilience, and productive diversification [5-7]. Strengthening economic complexity is a key strategic challenge for developing countries, which are characterized by a persistent specialization in primary or minimally processed products, in order to avoid the pitfalls of low value added and reduce their vulnerability to external threats.

Despite the abundance of research on finance and growth, on the one hand, and on economic complexity, on the other, the relationship between financial markets and economic complexity has not received sufficient attention in recent empirical research, particularly with regard to developing countries. The majority of studies focus either on the effect of finance on agricultural growth or on the non-financial factors that determine productivity complexity, neglecting the mechanisms by which market finance can influence sectoral sophistication and diversification. This gap is even more problematic than the ambiguous effects of finance: while open markets can help innovative firms obtain funding and support R&D investment, they can also encourage speculative behavior and divert resources from productive uses in the absence of robust institutional frameworks [8-11]. These conflicts are exacerbated in developing countries by weak institutions, sectoral concentration, and dependence on foreign capital flows.

This article specifically addresses this debate and aims to systematically and empirically analyze the relationship between market capitalization and economic complexity in developing countries. It makes three main contributions to the existing literature. First, it offers a comprehensive analysis of financial and productive dynamics by explicitly attributing stock market depth to changes in productive capacity as measured by the ECI, beyond conventional effects on GDP growth. Second, it highlights the conditionality of institutions and public policies by testing the hypothesis that the effect of stock market capitalization on economic complexity depends on the institutional framework, the level of financial development, and the coherence of industrial policies. Furthermore, the study uses recent data covering a long period and a large sample of developing countries, which helps to fill a still poorly documented empirical gap in this area.

This article is particularly important in the post-pandemic context and with regard to the challenges related to the energy and digital transitions. Developing countries face two challenges: diversifying their productive structures while financing significant investments in infrastructure, green technologies, and human capital. In this context, financial markets can serve as a strategic lever to direct national and international investments toward cutting-edge industries, provided that financial governance is effective and that financial, industrial, and educational policies are coordinated [12,13].

Following the introduction mentioned above, which constitutes Section 1, the remainder of the article is organized into six sections: Section 2 provides a brief overview of the literature; Section 3 outlines the empirical approach; Section 3 introduces and discusses the initial results; Section 4 focuses on sensitivity tests; and Section 6 conducts some robustness tests, with the conclusion presented in Section 7.

Literature Review

Theoretical Debate

The examination of the relationship between stock market capitalization and economic complexity in developing countries is part of a broader theoretical debate that opposes a quantitative and linear view of the financial system to a structural and conditional approach to productive transformation. Early contributions to classical and neoclassical growth models, such as those of Harrod-Domar and Solow, considered capital accumulation as the primary driver of economic growth. According to this view, finance is fundamentally seen as a mechanism for mobilizing savings and financing investments. This means that an increase in stock market capitalization should, among other things, promote productive growth and expansion. However, this simplistic approach is at odds with the changes observed in developing countries. These models, which rely on restrictive assumptions such as fixed production coefficients, rapid technological progress and perfectly efficient markets, fail to explain the persistence of undiversified production structures or to account for the distinct upward trajectories observed between countries [14,15].

This theoretical limitation leads to a more fundamental conflict between an approach that emphasizes the quality of resource allocation and a view of finance as a neutral factor in capital accumulation. In traditional frameworks, market capitalization is considered a basic indicator of financial depth, without taking into account the sectoral destination of financial flows or the productive capacity they mobilize. Conversely, more recent research shows that, in situations characterized by institutional, informational, and regulatory gaps, the growth of financial markets can encourage the concentration of investment in non-tradable or speculative sectors at the expense of additional high-value-added activities [10,16]. This perspective highlights the idea of a mechanical relationship between financial development and productive sophistication and suggests that, in certain situations, finance can actually hinder rather than promote structural change.

In contrast to this quantitative and exogenous view of growth, endogenous growth theories offer an analytical framework in which institutions, human capital, and innovation play a crucial role. Financial markets, particularly stock markets, actively participate in the selection and allocation of capital toward innovative and risky projects, rather than simply financing existing investments within this continental-inspired model. According to Hsu et al. (2014) and Aghion et al. (2023), stock market capitalization can therefore contribute to economic complexity by facilitating the financing of research and development, the emergence of new businesses, and technology transfer [9,17]. The causal mechanism relies on finance's capacity to support "creative destruction" by enabling the renewal of the productive fabric and diversification toward knowledge-intensive activities. This approach directly challenges the idea that only the amount of imported capital matters, emphasizing that it is the sectoral orientation that ultimately determines productive transformation.

However, this positive interpretation of the history of finance is also challenged by critical theories of financialization, which emphasize the contrast between traditional finance and unproductive finance. According to this view, the dominance of financial markets can foster short-termism, rent-seeking, and volatility, particularly when institutional and regulatory standards are weak. In these circumstances, an increase in stock market capitalization can deplete long-term productive investment resources and weaken industrial capacity, with negative effects on economic complexity and diversification [18,19]. This theoretical conflict highlights the fact that finance is neither inherently good nor inherently bad for a country, but that its effects depend heavily on the institutional environment and the incentives it receives. By emphasizing productive capacity and the complementarity between actors, sectors, and institutions, the economic complexity approach allows for the integration of these opposing viewpoints. From this perspective, development is viewed as a cumulative process of learning and coordination, where the structure of exports reflects the productive knowledge underpinning a country [5,6]. They considered market capitalization as a tool whose effectiveness depends on its ability to support the emergence and diffusion of new creative activities, rather than as a necessary condition or an end in itself. If financial markets are integrated into a coherent institutional ecosystem capable of directing financial flows toward strategic sectors, strengthening technological capabilities, and facilitating integration into global value chains, they can contribute to increased economic complexity [7].

Consequently, the effect of bourgeois capitalization on economic complexity in developing countries is theoretically ambiguous and perhaps non-linear. This relationship depends on contextual factors such as institutional quality, financial situation, initial productive organization, and the presence of active industrial policies. Beyond an automatic relationship between financial expertise and productive expertise, market financing has emerged as a necessary lever for structural change. It is precisely this ambiguity between the potential to support innovation and the risk of unproductive financialization that forms the basis of an in-depth empirical analysis aimed at determining the circumstances under which stock market capitalization effectively contributes to increasing economic complexity in developing countries.

Review of the Empirical Literature

The relationship between stock market capitalization and economic transformation has given rise to a constantly evolving body of empirical work. Existing research examines the extent to which stock market development contributes to economic growth, productive diversification, and structural change, particularly in developing and emerging economies. While much of the literature emphasizes the positive effect of stock market capitalization on economic performance, more recent studies highlight the conditional, nonlinear, and sometimes ambiguous nature of this relationship, which is highly dependent on the institutional framework, macroeconomic stability, and the initial level of productive sophistication. This empirical review highlights these contrasting findings by distinguishing between the positive effects documented in the literature and more nuanced and critical analyses.

An initial set of empirical studies concludes that stock market capitalization has a positive and significant impact on economic growth and structural transformation. Based on country panels and GMM estimates, fundamental studies by Levine and Zervos (1998) and Beck and Levine (2004) demonstrate that the size and liquidity of stock markets improve capital allocation, encourage investment, and foster innovation [20,21]. From a global perspective, Rajan and Zingales (1996) emphasize that the development of financial markets allows industries with high levels of external financing to grow more rapidly [22]. Bencivenga and Smith (1991) highlight the role of financial markets in risk management and portfolio diversification, which leads to more sustainable growth [23].

Several countries confirm these findings in emerging and developing economies. Beck (2000) and Demirgüç-Kunt and Levine (2001) both demonstrate how stock market capitalization promotes sectoral development, particularly by supporting the manufacturing sector [24,25]. Aghion et al. (2005) emphasize that the positive effect of financing through financial markets is amplified in economies characterized by strong innovation activity, while Acemoglu and Zilibotti (1997) highlight the reduction of financing constraints and the improvement of risk diversification [26,27]. These mechanisms are confirmed by more recent research. While Pagano and Pica (2012) and Odhiambo (2010) emphasize the positive effects on employment and productivity in a context of sufficient macroeconomic stability, Shravani and Sharma (2020) highlight a long-term relationship between market capitalization and growth in emerging economies [28-30]. According to Ayadi et al. (2014), market capitalization has a more positive effect on growth in Mediterranean countries than bank capitalization [31].

Recent contributions extend these findings by placing greater emphasis on structural transformation. According to Durusu-Ciftci et al. (2017), market-based financing promotes productive growth when focused on innovative industries [32]. More recently, Mealy and Teytelboym (2022) [7]. Furthermore, Soumtang Bime et al. (2024) show that financial development and openness can support economic transformation in sub-Saharan Africa, but only under specific institutional conditions [33].

However, another area of empirical research takes a more nuanced and critical approach, emphasizing that the effects of stock market capitalization are neither universal nor automatic. According to Porta et al. (1997), stock markets do not encourage resource allocation as effectively as those in countries with strong institutions [34]. Conversely, the positive effects are limited in economies characterized by insufficient investor protection and poor governance. According to Rodrik (2016) and Rodrik and Subramanian (2009), in developing countries, stock market capitalization can be disconnected from productive investment and increase macroeconomic volatility [16,35]. Levine (1997, 2005) and Demirgüç-Kunt and Levine (2008) both attest that the benefits of stock market development are significantly greater in economies with stable financial institutions [36-38].

Furthermore, empirical research highlights the risks associated with the rapid expansion of stock markets. Kose et al. (2009) and Fry (1997) demonstrate that the benefits associated with market capitalization are highly dependent on macroeconomic stability and the quality of public policies [39,40]. According to Bekaert and Harvey (2000) and Chinn and Ito (2006), financial openness can stimulate growth, but only if it is accompanied by credible institutional reforms [41,42]. Other studies highlight the procyclical effects and volatility caused by financial markets in low-resilience economies [43-45]. Dyck and Zingales (2004) show that high control rents in developing countries discourage productive investment, while Rodrik (1991) highlights the paradox that growing market capitalization can coexist with weak economic transformation in an environment of persistent political uncertainty [46,47].

Recent research expands upon this critique by highlighting the excessive risks associated with financialization. Cecchetti and Kharroubi (2015) and Epstein (2019) show that beyond a certain threshold, financial development can limit economic growth by diverting resources toward speculative activities [10,18]. More recently, Lapavitsas and Soydan (2022) and Ioannou and Wójcik (2019) have noted that financial short-termism and the financialization of firms could restrict productive investment and hinder industrial diversification, particularly in developing countries [19,48].

Overall, empirical evidence suggests that the effect of stock market capitalization on economic transformation is fundamentally heterogeneous and conditional. While stock markets can support productive growth and diversification, their contribution depends primarily on the quality of institutions, macroeconomic stability, and the ability of economies to direct financial flows toward high value-added industries. These disparate results justify a thorough empirical analysis aimed at determining the circumstances under which stock market capitalization effectively fosters economic complexity in developing countries.

Limitations of the Empirical Literature

Despite the abundance of empirical research on the relationship between stock market capitalization and economic performance, several conceptual, methodological, and empirical limitations hinder a comprehensive understanding of the role of stock markets in the structural transformation of developing countries.

A major limitation lies in the frequent confusion between economic growth and productive transformation. A significant portion of empirical studies uses indicators of agricultural growth, such as GDP per capita or total GDP, to examine the effects of stock market capitalization [20,21,31]. However, as Rodrik (2016) and Hausmann and Hidalgo (2014) point out, income growth does not necessarily reflect increased productivity or structural diversification [5,16]. This emphasis on agricultural macroeconomic indicators limits the country's ability to understand the mechanisms by which market financing could impact productive sophistication and technological capabilities.

Second, economic transformation is sometimes measured only partially and indirectly. According to Beck (2000) and Pagano and Pica (2012), existing statistics primarily use indirect indicators such as the share of the manufacturing sector, total factor productivity, or industrial employment [22,28]. While relevant, these indicators do not fully reflect the complexity of production structures, particularly in terms of the diversity and sophistication of economic activities. Industry still uses synthetic measures of productive capacity, such as the Economic Complexity Index (ECI), which is recognized as a reliable long-term indicator [6,7]. This gap is particularly evident in studies concerning developing countries.

The problems of endogeneity and reverse causality constitute a third limitation. Numerous studies demonstrate a positive correlation between market capitalization and growth without providing a satisfactory answer to the question of causality: do stock markets support economic transformation, or are they simply at an advanced stage of diversification? While some contributions employ dynamic methods (GMM) or instrumental variables, these approaches remain sensitive to the choice of instruments and empirical specifications [21,26]. As Cecchetti and Kharroubi (2015) point out, the lack of robust identification strategies limits the causal transfer of existing empirical findings [10].

Furthermore, the literature tends to underestimate the structural heterogeneity of Francophone countries. Many analyses rely on large samples that combine established, emerging, and emerging diseases, which can obscure the specific dynamics of developing countries [38,39]. Furthermore, as demonstrated by Rodrik and Subramanian (2009) and Soumtang Bime et al. (2024), the effects of financial development vary considerably depending on the institutional level, the basic productive structure, and the state's capacity to direct financial flows [33,35]. Thus, one of the main weaknesses in this area is the lack of central studies specifically focused on developing countries.

Another significant limitation lies in the insufficient consideration of the quality of financial allocation. Most countries use market capitalization as a quantitative indicator of financial performance without distinguishing between the financing of productive and speculative activities. Furthermore, recent analysis highlights that the growth of financial markets can be accompanied by financialization, short-termism, and resource depletion at the expense of productive investment [18,19,48]. This qualitative characteristic is rarely considered in current empirical analyses, particularly in studies applied to developing countries.

Finally, empirical work continues to focus on the non-linear and conditional nature of the relationship between market capitalization and economic transformation. While many countries recognize the importance of institutions and macroeconomic stability, few explicitly model the levels, asymmetric effects, or interactions between market financing, industrial policies, and productive capacity [34,41]. This gap aims to precisely identify the circumstances under which market capitalization becomes an effective lever of economic complexity.

Research Methodology

The Basic Model

Our model is based on the work of Demirgüç-Kunt and Levine (1996), Levine and Zervos (1996), and Ewah et al. (2009), who studied the link between the stock market and economic growth [49-51]. We modify the dependent variable in their models, replacing it with the ECI (Economic Complexity Index). The model, which specifies that socio-economic development is formulated as follows:

$$ECI_{it} = \alpha + \varphi ECI_{it-1} + \lambda MarketCapitalisation_{it} + \beta_1 GDPpercapita_{it} + \beta_2 FDI_{it} + \beta_3 Inflation_{it} + \beta_4 Pop\ dens_{it} + \beta_5 FBCF_{it} + \delta_t + \gamma_i + \varepsilon_{it}$$

$$i = 1, \dots, N \text{ and } t = 1, \dots, T.$$

To represent the strong persistence of productive structures and the cumulative nature of economic transformation processes, the Economic Complexity Index (ECI) was introduced with a time lag. This dynamic specification allows for the consideration of inertia and learning effects that characterize the accumulation of productive capacities. Within this empirical framework, the inclusion of country-fixed effects (γ_i) is particularly important. These effects, such as geography, economic history, the availability of natural resources, productive culture, or even long-term institutional quality, embody the unobservable and constant heterogeneity between nations over time. These structural characteristics affect both the development of financial markets and the trajectory of economic complexity, and their absence can lead to estimation bias. By controlling for these country-specific factors, the estimation makes it possible to identify the specific impact of stock market capitalization on productive transformation within countries, independent of their initial structural influences.

Furthermore, the introduction of fixed time effects (δ_t) allows us to control for common changes that simultaneously affect all countries over time, such as global business cycles, international financial crises, global technological advances, or commodity price disruptions. These factors can simultaneously impact market capitalization and economic complexity, and accounting for them is crucial to avoid conflating long-term structural relationships with global time effects.

Regarding the explanatory variables, their selection is based on factors related to finance and the economy, as well as those that determine productive transformation and economic complexity. The main variable of interest in this study is market capitalization. It is frequently used as a measure of the depth and degree of development of financial markets, reflecting their capacity to mobilize capital, facilitate capital allocation, and finance innovative and productive activities [20,21]. Recent research indicates that, in certain specific institutional contexts, market financing can play a crucial role in increasing productivity by facilitating the financing of innovative and knowledge-intensive sectors [7,32].

Regarding control variables, GDP per capita serves to regulate the initial economic level, which is a prerequisite for the sophistication of productive structures and the functioning of financial markets. Research on economic complexity shows that wealthier economies generally possess more diversified and sophisticated productive capacities through a cumulative process of learning and knowledge accumulation [6,52]. It is therefore possible to separate the effect of market capitalization from that of the overall level of development by controlling for GDP by place of residence.

The stock of foreign direct investment (FDI) is considered in order to access external capital, technologies, and knowledge that can support productive transformation. According to Acemoglu and Zilibotti (1997) and Aghion et al. (2005), FDI is an important driver of technology transfer and skills diffusion, which can increase economic complexity [26,27].

Numerous studies show that the impact of FDI on productive diversification is particularly significant in developing countries when these flows are directed toward the manufacturing and technology sectors [16,33].

Inflation is still used as an indicator of macroeconomic stability. High and volatile inflation is generally linked to increased uncertainty, which can discourage long-term investment, innovation, and the development of sophisticated production capacities [53,54]. In emerging economies, price stability is considered a necessity for the proper functioning of financial markets and the allocation of resources to productive activities [39].

To account for the effects of market size and domestic demand, population density is taken into consideration. A denser population can encourage economic diversification by creating a larger domestic market for new goods and services, thereby facilitating learning, innovation, and the production of more sophisticated goods [52,54]. Furthermore, higher population density can indicate a greater availability of labor, necessary for the creation of more knowledge-intensive goods. Finally, the accumulation of domestic productive capital is reflected in gross fixed capital formation (GFCF). Investments in infrastructure, buildings, and technologies are a key element of structural change and economic complexity [55]. Thus, regardless of the state of financial markets, GFCF serves as a control for real economic investment.

Estimation Technique and Identification Strategy

This study primarily uses the Generalized Method of Moments (GMM) system approach developed by Arellano and Bover (1995) and Blundell and Bond (1998), taking into account the dynamic specification of the empirical model and the structure of the data panel [56,57]. The use of this method is justified by several potential endogenous sources that are frequently highlighted in empirical research. First, a simultaneity bias can be used to characterize the relationship between market capitalization and economic complexity. The reverse is also conceivable: a more complex and diversified economy can stimulate the depth of financial markets by increasing the demand for sophisticated financing and improving profitability prospects [5,37]. This is true even though the development of stock markets can promote productive diversification and the accumulation of complex capabilities. Because of this bidirectional causality, traditional estimation methods, such as ordinary least squares (OLS) or fixed static effects models, are not appropriate.

Second, the model incorporates a lagged dependent variable, the economic complexity index ($ECIi_{t-1}$), to account for the inherently persistent and cumulative nature of productive transformation processes. As Hidalgo and Hausmann (2009) pointed out, economic complexity increases over time and is highly dependent on productive capacities accumulated over time [52]. However, the presence of this dynamic characteristic introduces bias in fixed effects models when the time dimension is limited, thus justifying the use of GMM estimators adapted to dynamic panels [58]. Conversely, endogeneity can also result from unobserved variables and measurement errors, as in the case of financial and macroeconomic indicators used for developing and emerging countries. Institutional, structural, or historical factors that are not directly observable can simultaneously impact market capitalization and economic complexity, leading to a correlation between explanatory variables and the error term.

The GMM system methodology allows for the simultaneous treatment of these two forms of endogeneity by combining initial occurrence analysis and level analysis while using internal instrumental variables. More specifically, the delayed values of endogenous and potentially endogenous variables are used as instruments, based on the assumption that these delays are correlated with common explanatory variables that are orthogonal to recent innovations in the error term [57,59]. This approach is particularly well-suited to panels with a large number of cross-sectional units (N) and a modulated time dimension (T), as is the case in this study covering 65 countries from 1995 to 2023. Two fundamental conditions are necessary for the identification strategy to be valid. On the one hand, the AR(1) and AR(2) tests proposed by Arellano and Bond (1991) are used to test for the absence of second-order spatial correlation in sequence errors [59]. On the other hand, the global validity of the instruments is assessed using Hansen's over-identification test, the non-significance of which indicates that the instruments used are globally exogenous and adequately specific. In accordance with Roodman's (2009) recommendations, particular attention is paid to limiting the number of instruments to avoid over-instrumentation problems that could skew the validity tests [60].

To verify the stability of the results obtained, other methods, such as fixed-effects models and GMM-based estimations, complement the GMM system estimations to ensure robustness. This empirical approach thus makes it possible to credibly identify the causal effect of market capitalization on economic complexity, while taking into account the structural and dynamic characteristics specific to emerging and developing countries. For macroeconomic and financial indicators, the data are primarily drawn from the World Development Index, while the economic complexity index is taken from the Atlas of Economic Complexity [61]. All estimations are performed taking into account country and time-dependent fixed effects, in order to control for unobservable heterogeneity specific to each country and common shocks affecting all economies over the period studied, respectively.

Sample and Data Characteristics

The sample used in this study consists of an unbalanced panel of 65 developing countries, covering the years 1995 to 2023. The availability and quality of data, particularly for market capitalization and economic complexity indicators, largely determined the data selection and sample size. This very long period allows for an understanding of the long-term dynamics of the productive transformation process, which is characterized by strong inertia and a steady accumulation of

productive capacity. The table of descriptive statistics opposite reveals a set of empirical characteristics consistent with the study's objective, which is to investigate the effect of market capitalization on economic complexity in developing countries. At the global level, the data structure shows significant heterogeneity between countries while maintaining statistical consistency compatible with dynamic panel estimation.

The dependent variable, the Economic Complexity Index (ECI), exhibits moderate dispersion around its mean, indicating a generally low but distinct level of production complexity in developing countries. This pattern confirms a well-documented stylistic fact: the majority of French companies continue to specialize in low-technology products, while others are beginning to pursue more advanced diversification strategies. This heterogeneity is a fundamental element for economic identification, as it implies the existence of distinct structural transformation dynamics influenced by financial development.

The main variable of interest, market capitalization, is characterized by an overall limited level, reflecting the shallow depth and incomplete maturity of financial markets in developing countries. However, the variations observed between countries suggest that some financial systems have progressed to the point of being able to contribute to the allocation of capital among high-technology industries. This relative dispersion is crucial from an empirical standpoint, as it allows us to identify the impact of market financing on economic complexity without mistaking it for a purely structural or uniform phenomenon.

The macroeconomic control variables exhibit greater instability. Developing countries' significant exposure to external shocks, international financial cycles, and internal imbalances is reflected in the volatility of inflation and foreign direct investment (FDI) flows. This macroeconomic instability can affect the trajectory of productive complexity by introducing uncertainty and reducing investors' planning horizons. It fully supports the inclusion of these variables in the specification to isolate the specific effect of market capitalization.

Variable	Obs	Mean	Std. Dev.	Min	Max
Eci	1044	-.034	.068	-.286	.242
Marketcapi	1029	.006	.011	-.014	.12
GDPpercapita	1042	.021	.043	-.201	.33
FDI	1043	-.042	.108	-1.122	.229
Inflation	1042	.012	.042	-.027	.922
Pop dens	1044	.008	.02	0	.144
GFCF	1043	.237	.07	.012	.58
Source: Authors.					

Table 1: Descriptive Statistics for the Variables

There is a notable disparity in per capita income, reflecting the different stages of development within the sample. This heterogeneity is important because economic complexity is strongly correlated with the level of development. By controlling this parameter, it is possible to avoid confusing the impact of finance with that of purely economic convergence processes. The structure of fixed capital appeared more stable, reflecting the structured nature of domestic investment. It serves as a potential channel between financial development and economic complexity, insofar as a more advanced financial system can improve the allocation of resources toward productive projects requiring a high level of capital and expertise.

Bivariate analysis reveals several empirical relationships consistent with the study's theoretical framework, based on the correlation matrix presented in Table 2. Firstly, market capitalisation shows a positive and significant correlation with the Economic Complexity Index. Although the strength of this correlation remains moderate, its sign confirms the main hypothesis of the article: more sophisticated and diversified productive structures are associated with greater development of financial markets. This relationship suggests that financial depth can promote a better allocation of capital towards technology-intensive industries, thereby facilitating structural change in developing countries. Inflation, meanwhile, shows a positive and significant correlation with market capitalisation, but a negative and significant correlation with GDP per capita, reflecting the ambivalence of macroeconomic stability in the process of increasing complexity. These results indicate that whilst inflation may sometimes accompany the development of stock markets in certain contexts, it has a negative impact on the overall level of economic development.

Foreign direct investment shows a significant negative correlation with the economic complexity index, which is far from paradoxical. This finding may reflect the sectoral structure of FDI in many developing countries, which often concentrates on extractive sectors or low value-added activities. In this context, FDI may even reinforce primary specialisation without necessarily contributing to successful productive diversification. Furthermore, population density shows a significant negative correlation with FDI, which may suggest that foreign investment flows are directed more towards less densely populated economies, potentially rich in natural resources.

Per capita GDP shows positive and significant correlations with population density and gross fixed capital formation, but its correlations with the economic complexity index and market capitalisation are weak and statistically insignificant. This result supports the idea that income levels, whilst relevant, are insufficient on their own to explain productive sophistication. Structural change depends not only on economic development but also on the quality of institutions, capital allocation mechanisms and technological learning dynamics.

Population density and gross fixed capital formation show positive and significant correlations with one another, as well as with several other variables in the model, which is consistent with the literature on the aggregate economy and the accumulation of productive capital. Gross fixed capital formation also shows a positive and significant correlation with market capitalisation, suggesting a complementarity between market financing and fixed capital investment in the process of increasing complexity. Finally, an overall examination of the matrix reveals no excessive correlation between the main variable of interest, market capitalisation, and the other explanatory factors. This indicates a low risk of multicollinearity in the final estimates and confirms the relevance of the dynamic economic analysis to be conducted subsequently, thereby reinforcing the empirical plausibility of the model.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Eci	1.000						
(2) Marketcapi	0.204*	1.000					
	(0.000)						
(3) GDPpercapita	0.018	-0.022	1.000				
	(0.569)	(0.489)					
(4) FDI	-0.304*	-0.053	-0.011	1.000			
	(0.000)	(0.090)	(0.711)				
(5) Inflation	0.029	0.168*	-0.091*	0.034	1.000		
	(0.350)	(0.000)	(0.003)	(0.268)			
(6) Pop_dens	0.167*	0.010	0.115*	-0.287*	-0.033	1.000	
	(0.000)	(0.738)	(0.000)	(0.000)	(0.292)		
(7) GFCF	0.026	0.066*	0.214*	-0.014	-0.117*	0.213*	1.000
	(0.393)	(0.035)	(0.000)	(0.654)	(0.000)	(0.000)	
*** p<0.01, ** p<0.05, * p<0.1 Source: Authors.							

Table 2: Correlation Matrix

Finally, the variance inflation factor (VIF), as shown in Table 3, is used to assess the risk of multicollinearity among the explanatory variables. The results indicate an overall satisfactory situation. Most variables have low VIFs, well below the critical threshold of 10 often used in empirical research. These include monetary capitalization, per capita income, inflation, FDI, GFCF and population density. These results imply that the main variable of interest (Marketcapi) does not exhibit collinearity problems with other regressions, thus ensuring a consistent estimate of its coefficient.

	VIF	1/VIF
Pop dens	1.155	.866
GFCF	1.12	.892
FDI	1.097	.912
GDPpercapita	1.063	.941
Inflation	1.053	.95
Marketcapi	1.041	.96
Mean VIF	1.088	.
Source: Authors.		

Table 3: Multicollinearity Test

Baseline Results

Table 4 presents the results of the GMM system estimations determining the effect of market capitalization on economic complexity in a panel of 65 developing countries. To assess the robustness of the results and reduce bias caused by the removal of relevant factors, the additional columns correspond to progressive specifications that successively include the control variables.

The lagged variable of economic complexity (L.ECI) appears positive and highly significant across all specifications, reflecting a strong dynamic inertia in productive complexity in developing countries. This result highlights the fundamentally cumulative and path-dependent nature of the structural transformation process: economies that already possess a certain stock of productive capacity, technological know-how, and diversified industrial structures are better positioned to further increase their complexity over time. Economically, this persistence reflects the slow but progressive accumulation of productive knowledge, specific skills, and production networks, which cannot be rapidly created ex nihilo. This result is fully consistent with the theory of economic complexity as well as with evolutionary and Schumpeterian approaches to growth, according to which innovation and diversification are based on specific historical trajectories [52]. It empirically justifies the use of dynamic modeling and reinforces the idea that productive transformation policies produce their effects primarily in the medium and long term.

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: ECI					
L.Eci	0.7292***	0.7208***	0.7430***	0.7354***	0.1828***	0.0759***
	(0.0100)	(0.0134)	(0.0121)	(0.0131)	(0.0344)	(0.0278)
Marketcapi	**0.1949*** **	**0.1894*** **	**0.3059*** **	**0.2906*** **	**0.4256*** **	**0.3086*** **
	(0.0204)	**(0.0223)**	**(0.0404)**	**(0.0447)**	**(0.0530)**	**(0.0975)**
GDPpercapita		-0.0638***	-0.0399***	-0.0398***	0.0223***	-0.0052
		(0.0035)	(0.0031)	(0.0039)	(0.0031)	(0.0089)
FDI			-0.0662***	-0.0574***	-0.0286	0.0313
			(0.0117)	(0.0116)	(0.0267)	(0.0332)
Inflation				0.0412	-0.0463	-0.0713
				(0.0263)	(0.0624)	(0.0667)
Pop_dens					7.1229**	2.7331
					(2.8251)	(3.4548)
GFCF						0.1476***
						(0.0312)
Constant	-0.0030***	-0.0017	-0.0048***	-0.0047***	-0.0650***	-0.0869***
	(0.0008)	(0.0011)	(0.0011)	(0.0014)	(0.0078)	(0.0147)
Observations	1748	1747	1600	1600	1600	1484
Number of countries	64	64	62	62	62	60
Number of instruments	53	53	53	53	45	45
AR1 p-value	0.000	0.000	0.000	0.000	0.000	0.000
AR2 p-value	0.431	0.532	0.536	0.517	0.427	0.452
Hansen p-value	0.189	0.117	0.138	0.119	0.181	0.295
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Source: Authors.						

Table 4: Effects of Market Capitalization on ECI in Developing Countries (System GMM)

Within this dynamic framework, market capitalization, the main variable of interest, has a positive and statistically significant effect on economic complexity across all specifications. This result suggests that the depth of stock markets is a central lever for productive transformation in developing countries. Economically, higher market capitalization reflects a greater capacity of the financial system to mobilize savings, diversify sources of financing, and direct resources toward more technology-intensive projects. Unlike financial systems dominated exclusively by bank credit, stock markets make it possible to finance risky, long-term investments, often necessary for innovation, industrial upgrading, and export diversification. This result corroborates the work of Levine and Zervos (1998), Beck and Levine (2004), and, more recently, that of Nguyen et al. (2020), which show that the efficiency of financial markets plays a crucial role in increasing economic complexity, particularly by providing alternative mechanisms for financing patents and innovation [20,21,62]. This also aligns with the work of Ndoya et al. (2024), according to which the positive impact of financial development on economic complexity depends on the degree of economic, political, and financial stability of countries, with the most stable economies being those where finance effectively contributes to productive transformation [63]. Thus, our results suggest that market capitalization, when operating within an appropriate institutional environment, fosters the transition to more diversified and sophisticated economies by strengthening synergies between finance, innovation, and structural transformation.

However, the effect of market capitalization is embedded in a broader economic environment, which leads us to examine the role of GDP per capita. The results show a contrasting effect of this variable, negative and significant in some specifications and positive or insignificant in others. This instability suggests that income level is not in itself an automatic determinant of

economic complexity. In developing countries, an increase in per capita income can result from low-complexity activities, such as the exploitation of natural resources or unsophisticated services, without necessarily being accompanied by productive diversification. This finding aligns with the analyses of Rodrik (2014) and McMillan and Rodrik (2014), who emphasize that economic growth can become decoupled from structural transformation when the latter is not supported by industrialization or technological upgrading [1,64]. Thus, income appears more as a contextual variable than as a direct driver of economic complexity.

Following this line of reasoning, foreign direct investment (FDI) exhibits a negative and statistically significant effect on economic complexity in the initial specifications of the model, before losing its significance when additional structural variables are introduced. Statistically, the observed negative and significant coefficients indicate that an increase in FDI is associated with a decrease in the economic complexity index, thus suggesting that not all FDI flows necessarily contribute to the productive transformation of developing economies. From an economic perspective, this result can be explained by the sectoral nature of FDI in these countries, which is primarily directed towards extractive sectors, low value-added activities, or unsophisticated services, generating few technological spillover effects and limiting knowledge transfer. In this context, FDI can reinforce a low-complexity productive specialization, thereby accentuating a structural dependence on a few dominant sectors.

This result is consistent with a significant body of literature that emphasizes that, in the absence of sufficient local capacity and robust institutions, FDI can produce enclave-like effects, without genuine integration into domestic value chains [65,66]. However, the loss of significance of the FDI coefficient in the most comprehensive specifications suggests that its impact on economic complexity is conditional on other structural factors, including domestic investment, population density, and the level of financial development. Thus, unlike market capitalization, which acts as an internal catalyst for productive complexity, FDI appears to play a more ambiguous role in developing countries, its contribution to economic complexity depending heavily on its sectoral orientation, its degree of local integration, and the technological absorptive capacity of the host economies. Macroeconomic stability, as measured by inflation, does not appear to have a significant effect on economic complexity in the estimates. Although inflation is classically considered a factor influencing investment and innovation, its lack of significance suggests that, in developing countries, structural constraints weigh more heavily than price fluctuations on the dynamics of productive transformation. This finding is consistent with the work of Fry (1997) and Kose et al. (2009), according to whom macroeconomic stability is a necessary but not sufficient condition for driving profound structural transformation [39,40].

In contrast, population density has a positive and significant effect in certain areas, indicating that the size of the domestic market and agglomeration effects can promote productive diversification. A denser population can stimulate demand for a variety of goods, encourage specialization, and facilitate interactions between economic agents. However, the loss of significance of this variable when investment is introduced suggests that these demographic effects only materialize fully when accompanied by efforts to accumulate capital and improve productive capacity. This finding partially aligns with Hidalgo and Hausmann (2009) and Nguea (2024), while also highlighting the limitations of purely demographic effects in developing countries [52,67].

Finally, gross fixed capital formation (GFCF) has a positive and significant effect on economic complexity, confirming the central role of domestic productive investment in structural transformation. Capital accumulation enables the adoption of new technologies, the improvement of productive infrastructure, and the expansion of industrial capacity, essential elements for the production of more complex goods. This finding is consistent with endogenous growth theories and empirical analyses, which emphasize the fundamental role of investment in moving up the production value chain [15,64].

Sensitivity Tests

We conduct several sensitivity tests to increase the reliability of our findings and minimize any omission bias. To isolate the direct effect of market capitalization, we progressively included additional variables, such as natural resources, remittances, and domestic credit to the private sector. We also perform subregional calculations to test the geographical heterogeneity of the effects. Finally, we incorporate sociocultural and institutional factors to test the stability of the results with respect to the structural characteristics of the countries.

Sensitivity Related to Additional Economic Variables

The sensitivity analysis of the study in the table below examines the strength of the positive relationship between market capitalization and economic complexity when structural factors frequently mentioned in the economic development literature, such as natural resources, remittances, and domestic credit, are added. Indeed, the debate on economic transformation in developing countries would be incomplete without considering the contradictory roles these variables play in the dynamics of productive diversification.

The first notable result concerns natural resources. Their inclusion in the model demonstrates a statistically significant and undeniably negative relationship with the economic complexity index, confirming the existence of the "resource curse." This phenomenon has been theorized since the 1990s by Auty (1994) and Sachs and Warner (1999), who argue that the abundance of natural resources in less industrialized and financially vulnerable countries tends to hinder structural economic development [68,69]. This dynamic can be observed, for example, in the growth of rentier economies, when

governments, attracted by the easy profits derived from resource extraction, postpone long-term industrial policies [70]. According to our analysis, this negative relationship implies that the existence of natural resources fosters the status quo in terms of institutions and technology, hindering necessary progress toward high value-added industries and thus limiting the global production capacity for future productive transformation potential. This finding corroborates recent conclusions that resource rent increases inefficient bureaucratic behavior and customer-centric logics, in addition to reducing the need for reforms [71,72].

Interestingly, the relationship between market capitalization and economic complexity remains strong and significant despite the constraints imposed by natural resources. This suggests that financial markets, such as national stock exchanges, could serve as drivers of productive diversification, particularly in environments where commodity exports predominate. This observation calls for a revision of traditional approaches that tend to view developing countries as rent-seeking prisoners. Conversely, it reveals that by encouraging a better allocation of capital, the dynamism of the financial sector can partly compensate for the negative effects of resource wealth, thus helping to refocus financial resources towards more innovative and complex sectors [37,73].

In our model, the effect of remittances from staff on economic complexity appeared rather insignificant. Although they are often considered to support domestic demand and sometimes to provide informational capital for local investment, remittances had no discernible effect in this system. This is consistent with previous findings, such as those of Chami et al. (2005), which highlight the often consumer-oriented nature of these financial flows [74]. In developing countries, remittances tend to support consumption rather than innovation or industrial capacity in the absence of public incentives for productive investment or appropriate intermediary financial mechanisms. Giuliano and Ruiz-Arranz (2009) also demonstrated that the impact of these flows is strongly influenced by the level of local financial development, which may explain their lack of effectiveness in contexts where captive markets are still relatively underdeveloped [75]. Therefore, while remittances can alleviate some household liquidity constraints, their structural contribution to the growth of economic complexity is limited in the absence of specific institutional support.

	(1)	(2)	(3)
	Dependent variable: ECI		
L.ECI	0.6176***	0.6690***	0.7445***
	(0.0398)	(0.0300)	(0.0451)
Market capitalization	**0.2751****	**0.3987*****	**0.6161*****
	(0.1060)	**(0.1243)**	**(0.1316)**
GDP per capita	-0.0050	-0.0362***	-0.0168
	(0.0123)	(0.0100)	(0.0124)
FDI	-0.0497**	-0.0213	-0.0254***
	(0.0203)	(0.0226)	(0.0037)
Inflation	-0.1526**	-0.2013***	0.1249*
	(0.0720)	(0.0607)	(0.0683)
Pop_dens	4.2969***	4.0396***	0.3923
	(1.1084)	(0.9760)	(0.5477)
GFCF	-0.0365	0.0103	0.0757***
	(0.0310)	(0.0251)	(0.0226)
Total natural resources	**-0.0808*****		
	(0.0246)		
Personal remittances		**-0.0321**	
		(0.0296)	
Domestic credit			**-0.0233*****
			(0.0074)
Constant	-0.0345***	-0.0404***	-0.0232***
	(0.0078)	(0.0081)	(0.0068)
Observations	992	992	992
Number of countries	45	45	37
Number of instruments	36	36	34
AR1 p-value	0.000	0.000	0.000
AR2 p-value	0.719	0.962	0.542
Hansen P-value	0.523	0.680	0.429
Source: Authors.			

Table 5: Sensitivity with Additional Macroeconomic Variables (System GMM Estimates)

Domestic credit has a significant negative effect on economic complexity, which may seem counterintuitive at first glance. In theory, broader access to credit should foster the growth of new productive sectors, enable investment in innovation, and thus accelerate the increase in complexity. However, this finding is echoed in the literature, which emphasizes the importance of the quality of financial institutions. Indeed, in many developing economies, credit is often allocated to low-risk sectors, such as real estate or business, and it takes time for it to reach emerging industrial activities [76,77]. This poor allocation of credit hinders structural transformation and undermines the development of complex sectors. Rajan and Zingales (1998) highlighted this systematic bias in credit distribution, which is exacerbated in situations where institutions do not effectively fulfill their role of allocating financial resources as efficiently as possible [22]. Consequently, domestic credit perpetuates the logic of speculative and rent-seeking investments in less sophisticated sectors, rather than promoting technological progress and productive diversity.

The overall interpretation of this sensitivity analysis thus reveals a remarkable stability in the initial relationship between stock market capitalization and economic complexity, even after accounting for a number of structural factors. This finding implies that stock market financing remains a robust and reliable indicator of productive complexity, provided that its benefits are not neutralized or diverted by unprofitable economic structures or inefficient domestic financing. Therefore, even in macroeconomic environments with structural vulnerabilities, the stock market, by providing long-term resources to innovative and complex firms, represents an underutilized but promising avenue for facilitating the transition to more diversified and resilient economies. These findings corroborate those of the new institutional economics, according to which well-managed, productivity-oriented financial institutions can counteract the negative effects of the structural context to foster economic complexity and growth [37,73].

Subregional Heterogeneity

The subregional sensitivity test, as expressed in the table opposite by the coefficients related to the variables specific to each region (Europe, Asia, Latin America and the Caribbean, or LAC, and MENA), provides valuable information on the heterogeneity of the effect of stock market capitalization on economic complexity in developing countries. This test is based on robust GMM estimates, and its findings support the idea that the effectiveness of financial development, particularly through stock exchanges, is strongly influenced by the institutional, geopolitical, and economic circumstances specific to each region.

The positive and significant effect of stock market capitalization on economic complexity is consistent across all specifications, regardless of the regional effects controlled for. This result corroborates the findings of King and Levine (1993) and Beck and Levine (2004), who argue that developed financial systems promote the expansion of high value-added industries, facilitate the efficient allocation of resources, and encourage technological innovation [21,78]. Significant stock market capitalization coefficients indicate that stock market expansion serves as a gateway to more sophisticated industrial chains. Among other things, it encourages the expansion of production capacities codified in developing country exports by enabling the financing of innovative projects and the raising of significant capital for complex sectors [22,79].

However, a significant dispersion of results emerges when dummy variables are introduced to identify the specific effects of subregions. Despite relatively high levels of capitalization, emerging Europe exhibits a negative impact on economic complexity. This challenging situation can be interpreted in light of the work of Estrada et al. (2010), which show that some transition economies have not yet adapted their inherited basic productivity to a new, innovation-driven structure [80]. Indeed, financial markets can develop without necessarily fostering economic diversification if corporate governance, investor rights, and financial transparency mechanisms are not firmly established [81].

Despite its heterogeneity, Asian countries also exhibit a negative regional effect, indicating that financial liberalization alone is insufficient to create a complex economy. This observation aligns with the findings of Demirgüç-Kunt and Maksimovic (1998), who emphasize that in economies with weak regulatory structures, speculation can dominate financial markets without an efficient allocation of resources to high-tech or knowledge-intensive sectors [82]. For example, in several South Asian countries, the lack of sectoral infrastructure geared towards the export of complex goods limits the positive effects of stock market development.

Furthermore, Latin America and the Caribbean (LAC) exhibits a significant negative coefficient. This finding aligns with the conclusions of De la Torre et al. (2008), who demonstrated that, despite the apparent expansion of financial markets in several Latin American economies, these markets continue to suffer from fragmentation, a lack of liquidity, and low financial inclusion, thus limiting their capacity to contribute to industrial development [83]. While stock market capitalization may grow within an unstable macroeconomic framework, its transformative potential remains constrained by the absence of coherent industrial policies. Bittencourt (2012) also highlights that in some countries in this region, structural reform is hampered by persistent inflation, high volatility, and an underdeveloped financial system [84].

	(1)	(2)	(3)	(4)	(5)
	ECI				
L.Eci	0.8598***	0.0952***	0.1256***	0.0816***	0.0372*
	(0.0362)	(0.0276)	(0.0193)	(0.0183)	(0.0206)
Marketcapi	**0.0377****	**0.3045*****	**0.7533*****	**0.6532*****	**0.3712****
	(0.0182)	**(0.0854)**	**(0.0543)**	**(0.1948)**	**(0.1497)**
GDPpercapita	0.0011	-0.0226***	-0.0413***	0.0245**	0.0001
	(0.0023)	(0.0070)	(0.0073)	(0.0099)	(0.0120)
FDI	-0.0254*	0.0640**	0.1675***	0.1150***	0.2458***
	(0.0132)	(0.0252)	(0.0379)	(0.0297)	(0.0442)
Inflation	-0.0263	-0.0148	0.0261	-0.1222***	0.0430
	(0.0287)	(0.0290)	(0.0322)	(0.0417)	(0.0315)
Pop_dens	1.1828*	4.8278***	9.5065***	6.4996***	7.2299***
	(0.6808)	(1.3006)	(2.7167)	(0.8692)	(1.6084)
GFCF	0.0043	0.1599***	0.2747***	0.1795***	0.1359***
	(0.0139)	(0.0196)	(0.0247)	(0.0374)	(0.0379)
SSA	**-0.0153**				
	(0.0146)				
Europe		**-0.5039*****			
		(0.1335)			
Asie			**-0.1101*****		
			(0.0330)		
ALC				**-0.2461*****	
				(0.0315)	
MENA					**0.1380*****
					(0.0260)
Constant	-0.0077	-0.0120	-0.1239***	-0.0382***	-0.1066***
	(0.0058)	(0.0095)	(0.0102)	(0.0136)	(0.0140)
Observations	1005	1005	1005	1005	1005
Number of countries	42	42	42	42	42
Number of Instruments	39	41	41	41	41
AR1 p-value	0.000	0.000	0.000	0.000	0.000
AR2 p-value	0.291	0.562	0.383	0.683	0.662
Hansen p-value	0.316	0.444	0.271	0.876	0.731
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Source: Authors.					

Table 6: Subregional Heterogeneity GMM Estimates)

Conversely, the countries of the MENA region stand out with a statistically significant and positive coefficient. This dimension is explained by the major economic reforms implemented since 2010, particularly in the Gulf countries, aimed at diversifying the economy through productive investments, improving the business climate, and supporting innovation and entrepreneurship. Strategies such as "Vision 2030," which aim to reorganize rentier economies to base them on technology and knowledge, are presented in the World Bank's 2020 report. Improved financial infrastructure, the creation of regional stock exchanges, and targeted education policies all contribute to maximizing the beneficial effects of consumer markets on economic complexity [85]. This supports the argument that stock market capitalization can play a structuring role provided it is accompanied by a coherent developmental vision.

It is also necessary to place these results within the economic context that underpins their interpretation. The robustness of the GMM calculations used is demonstrated by statistics indicating a Hansen p-value greater than 0.1 in all cases, which confirms the validity of the instruments [60]. The absence of second-order autocorrelation, confirmed by AR(2) tests, strengthens the validity of the dynamic estimates. As Hidalgo and Hausmann (2009) hypothesized, the coefficient of the lagged complexity variable (L.ECI) is statistically significant and high, reflecting a structural imbalance in the evolution of economic complexity [52]. This persistence implies that lasting change can only be achieved over a long

period and depends on an irreversible and cumulative accumulation of productive knowledge.

Sensitivity to Sociocultural and Institutional Factors

The interpretation of the sensitivity test to sociocultural and institutional factors presented in the table opposite suggests that the significant and positive relationship between market capitalization and economic complexity in developing countries is not uniform, but rather subject to significant modulations by identified variables, such as majority religiosity, and ethnic, linguistic, and religious fragmentation. These variables introduce a structural heterogeneity that nuances the effects reflected by the overall coefficients of the basic models, highlighting the profound role of information institutions, identity categories, and belief systems in explaining socioeconomic outcomes [86,87].

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: ECI					
L.ECI	0.4744***	0.6121***	0.7088***	0.4176***	0.3333***	0.4016***
	(0.0315)	(0.0258)	(0.0341)	(0.0333)	(0.0384)	(0.0205)
Marketcapi	**-0.0212**	**-0.1365**	**0.5306*** **	**-0.5216*** **	**-0.2634***	**-0.1422**
	(0.0891)	**(0.1148)**	**(0.1052)**	**(0.1492)**	**(0.1411)**	**(0.1220)**
GDPpercapita	-0.0060	-0.0426***	-0.0557***	0.0122	0.0047	0.0008
	(0.0082)	(0.0061)	(0.0052)	(0.0077)	(0.0078)	(0.0080)
FDI	0.0689***	-0.0030	-0.0041	0.0854***	0.0885***	0.0659***
	(0.0199)	(0.0195)	(0.0101)	(0.0194)	(0.0191)	(0.0159)
Inflation	-0.0633	-0.1759**	-0.0711**	-0.1631**	-0.0785	-0.1219**
	(0.0402)	(0.0714)	(0.0300)	(0.0788)	(0.0493)	(0.0565)
Pop_dens	6.4934***	5.3860***	4.0686***	6.5092***	5.4220***	6.3694***
	(1.5967)	(1.0064)	(0.8518)	(1.3146)	(1.6867)	(0.9935)
GFCF	-0.0500*	0.0494**	-0.0010	-0.1045***	-0.1020***	-0.0779***
	(0.0275)	(0.0232)	(0.0251)	(0.0292)	(0.0250)	(0.0214)
muslim80	**0.1121*** **					
	(0.0237)					
Catholic		**-0.0764*** **				
		(0.0238)				
Fract_Ethnic			**0.0834** **			
			(0.0330)			
Fract_Language			**-0.2164*** **			
				(0.0321)		
Fract_Religion				**-0.2537*** **		
					(0.0297)	
Religion						**-0.1894*** **
						(0.0420)
Constant	-0.0874***	-0.0363***	-0.0832***	0.0653***	0.0722***	0.0380**
	(0.0155)	(0.0106)	(0.0193)	(0.0181)	(0.0180)	(0.0184)
Observations	992	992	964	992	992	992
Number of countries	49	49	49	49	49	49
Number of instruments	36	36	35	36	36	36
AR1 p-value	0.000	0.000	0.000	0.000	0.000	0.000
AR2 p-value	0.655	0.812	0.486	0.251	0.921	0.542
Hansen p-value	0.837	0.763	0.798	0.794	0.811	0.765
Source: Authors.						

Table 7: Sensitivity to Sociocultural and Institutional Factors (System GMM Estimates)

First, the inclusion in the model of cultural and identity variables, such as Muslim80 (predominantly Muslim) and Catholic (predominantly Catholic), reasonably modifies the market capitalization coefficient. Once these factors are taken into account, market capitalization has a significant positive effect on the economic complexity index in specification (3). However, this effect is completely reversed when the variables of ethnolinguistic or religious fragmentation are included in specifications (4) to (6). This reversal results in a moderating effect of sociocultural factors, which confirms the theory that traditional economic determinants exert their influence only through the filter of the nation's social and cultural institutions [88].

The variable "Muslim80" shows a positive and statistically significant relationship with economic complexity, indicating that in Muslim-majority countries, there is a positive correlation between market capitalization and export sophistication. This result can be interpreted in the context of alternative financial structures found in these countries, such as Islamic finance, which encourages financial inclusion and directs exports toward profitable investments without necessarily resorting to speculative mechanisms. This dynamic can therefore act as a lever for structural change by creating a socially and culturally homogeneous environment [89].

Conversely, the variable "Catholic" has a significant but negative effect. Several converging interpretative hypotheses can be put forward: some authors suggest that traditional Catholic theology is less favorable to competitive capitalism and the ethics of forward movement in dynamic market economies [90]. Although this interpretation must be handled with care to avoid overgeneralization, it contributes to the discussion on the relationship between dominant religious values and institutional effectiveness, particularly in the financial sector.

The role of fractionalization variables is very instructive. There is a significant negative correlation between economic complexity and ethnolinguistic (Fract_Ethnic and Fract_Language) and religious (Fract_Religion) fragmentation. These results support the idea that economies with fragmented social identities are less likely to successfully convert market capitalization into advantages in terms of complexity. Tabellini (2010) demonstrates that social capital is weaker in fragmented societies, which reduces the quality of institutions and makes it more difficult to establish the coordination mechanisms necessary for innovation and technological progress [91]. These contexts often suffer from chronic political instability, weak trust networks, and a low propensity to implement long-term projects.

This idea is reinforced by the composite variable "religion," which incorporates the many dimensions of religious heterogeneity and shows a net negative effect when introduced into the model (6). This suggests that the absence of religious unity can reshape structural economic dynamics, not only in terms of production but also in terms of the quality of the fabric produced. According to Aghion et al. (2010), religious differences exacerbate political polarization, undermine the coherence of economic policies, and hinder the accumulation of human and social capital, two essential factors for the transition to more complex productive structures [92]. These findings are consistent with modern institutionalist analyses that posit that formal institutions, such as financial markets, function most effectively when governed by cohesive social norms, institutional trust, and productive interethnic cooperation [93]. Consequently, in developing countries, stock market capitalization becomes a useful tool for enhancing economic complexity only when societal conditions allow for its effective mobilization. In contrast, in fragmented societies, this mechanism is hampered by mistrust, financial regulations, or even a lack of involvement in collective governance.

Consequently, the political implication is clear: economic decision-makers can no longer envision the growth of financial markets in a technocratic and deinstitutionalized manner. On the contrary, in order for stock market capitalization to support the long-term increasing complexity of production, reforms must simultaneously aim to promote social cohesion, civic education, and the encouragement of cultural norms conducive to intergroup cooperation. Sen's (1999) analysis of the importance of social identities in the development process remains relevant, advocating an integrated and endogenous approach to economic development.

Robustness Tests

We conduct several robustness tests along three additional axes to ensure the validity of our findings. First, we replace competing indicators with the primary measure of economic complexity (ECI) to ensure our findings are independent of any particular choice of proxy variables. Second, where external instruments are limited, we use alternative approaches to address endogeneity, such as Lewbel's (2012) method, which uses heteroscedasticity to generate internal instruments [94]. Finally, we re-estimate the model using the IV-GMM 2S, IV-LIML, and IV-CUE estimators and quantile regression to test the robustness of the results against various instrumentation methods and to correct for potential biases related to instrument limitations. Lastly, we use Driscoll-Kraay error norms to control for cross-sectional dependence and autocorrelation, which are common in macroeconomic panels. This methodological triangulation aims to demonstrate that our findings are independent of any particular measure and are not influenced by the chosen estimation approach.

Alternative Measures of Economic Transformation

Robustness checks using other structural transformation indices are essential for improving our understanding of the relationship between market capitalization and economic complexity in emerging market economies (EMEs). These checks offer a multifaceted perspective through which this evolution can be assessed, in addition to confirming the stability of the initial results presented using the Economic Complexity Index (ECI). Consequently, the empirical estimates

presented in Table 8 use three potential indicators, each capturing a distinct but complementary aspect of economic sophistication and transformation.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ECI_plus		ECI_Trade		ECI_Technology		ECI_Research	
L.ECI_plus	**0.8791*** **	**0.8509*** **						
	(0.0028)	**(0.0256)**						
L.ECItrade			**0.3722*** **	**0.3340*** **				
			(0.0074)	**(0.0274)**				
L.ECI_ Technology				**0.0236** **	**0.1515*** **			
					(0.0100)	**(0.0273)**		
L.ECI_ research						**0.3834*** **	**0.2056*** **	
							(0.0130)	**(0.0288)**
Marketcapi	**0.1162*** **	**0.0761*** **	**0.6953*** **	**0.0289*** **	**0.3590*** **	**0.3247*** **	**0.3471*** **	**0.1721*** **
	(0.0133)	**(0.0850)**	**(0.0910)**	**(0.1348)**	**(0.0717)**	**(2.4146)**	**(0.1140)**	**(1.0414)**
GDPpercapita		-0.0624***		0.0303***		0.0222		0.0335
		(0.0113)		(0.0050)		(0.0280)		(0.0368)
FDI		0.1298***		0.0924***		0.0485		0.4363***
		(0.0219)		(0.0129)		(0.0836)		(0.1452)
Inflation		0.3733***		0.1482***		-0.8112***		0.4238***
		(0.0657)		(0.0023)		(0.1367)		(0.0978)
Pop_dens		0.1930		1.2684**		3.7317**		8.8204**
		(0.3165)		(0.5202)		(1.7847)		(3.7325)
GFCF		0.1607***		0.0734***		0.3806***		-0.1563***
		(0.0300)		(0.0177)		(0.0847)		(0.0551)
Constant	0.0002	-0.0360***	0.0083***	-0.0112	-0.0060*	-0.1622***	0.0331***	0.0069
	(0.0005)	(0.0058)	(0.0010)	(0.0068)	(0.0032)	(0.0322)	(0.0006)	(0.0195)
Observations	910	909	833	832	873	873	992	992
Number of countries	36	36	36	36	36	36	36	36
Number of instruments	32	32	32	32	33	33	33	33
AR1 p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR2 p-value	0.698	0.274	0.202	0.217	0.676	0.306	0.104	0.420
Hansen p-value	0.420	0.208	0.350	0.368	0.280	0.611	0.354	0.561
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Source: Authors.								

Table 8: Market Capitalization and Alternative Measures of Economic Transformation (System GMM Estimates)

The first two columns of the table are based on the enhanced version of the complexity index developed by Albeaik et al. (2017), or ECI+, which goes beyond the standard ECI by taking into account the challenges associated with exporting specific goods [95]. The ECI+ offers a more comprehensive understanding of export structure and underlying production capacities by accounting for the probability of global diffusion of products and compensating for the global ubiquity of goods exported by different countries. A continuous dynamic process of structural transformation is highlighted by the statistically significant and remarkably high coefficients of the shifted ECI+ in columns (1) and (2). Furthermore, the capitalization variable continues to have a strong and notable beneficial impact in these models, confirming its apparent catalytic role in strengthening a country's capacity to transition to more sophisticated production. This supports the view that financial development acts as a lever for productive diversification by promoting investment and resource mobilization, particularly in situations where the economy is already engaged in complex activities [95].

The ECItrade variation is simultaneously exploited by the third and fourth specifications. This indicator places greater emphasis on the structural characteristics of a country's trading partners than ECI+. In other words, it assesses the impact of relational trade positions on a country's capacity to generate complexity. This idea was inspired by Hidalgo et al. (2007), who argue that complexity arises from co-export networks and competitive pressure rather than from isolated development [96]. Market capitalization also has a significant positive impact on ECItrade scores in this case, demonstrating how deeper financial markets help economies realign within increasingly dynamic and relationally complex global value chains. The synergistic influence of global financial integration and macroeconomic stability on complexity outcomes – a link extensively examined by Hausmann et al. (2007) – is also reflected in the relevance of control variables such as GDP per capita and foreign direct investment in these specifications [97].

To represent the technological depth embedded in the articles rather than simply their diversity, the last two columns use a technologically nuanced version of complexity called ECI_Technology. This dimension provides an approximation of the technological intensity of a country's production structure, as well as the diversity and complexity of its products. This measure aligns with the methodology used by Archibugi and Coco (2004), who developed the NITC-ArCo index to assess technological capabilities in three areas: infrastructure for innovation, the quality of human capital, and technological creation [98]. It is worth noting that, even with slightly larger standard errors, the impact of market capitalization increases in model (6), with the coefficient becoming particularly high and statistically significant. This implies that financial markets are essential for attracting long-term investment, encouraging R&D spending, and developing scalable technologies that drive transformation in contexts where manufacturing intersects with high-tech activities [98].

The introduction of the ECI_research indicator in columns (7) and (8) of the table enriches the analysis by incorporating a dimension explicitly based on scientific output, research, and the cognitive intensity of the production system. Unlike other variants focused primarily on export structure or the technological intensity of goods, ECI_research captures a country's capacity to generate, absorb, and transform knowledge into sustainable productive advantages. The coefficients associated with the lagged variable L.ECI_research are positive and highly significant, confirming the existence of a persistence effect in the research-driven complexity dynamics.

Furthermore, the market capitalization variable remains positive and significant in these specifications, indicating that the depth of the financial market supports not only diversification and technological sophistication but also the research and innovation ecosystem. By facilitating long-term financing and reducing liquidity constraints, capital markets promote R&D investment, the development of scientific infrastructure, and the accumulation of advanced human capital. Thus, ECI research confirms that the relationship between market capitalization and economic transformation is not limited to visible commercial or industrial performance, but extends to the intangible foundations of structural competitiveness. This research-based dimension aligns directly with the tradition of endogenous growth models developed by Romer (1990), for which knowledge accumulation and R&D investment are central drivers of long-term growth. From this perspective, the production of ideas generates positive externalities and increasing returns, which reinforces the role of financial institutions in the efficient allocation of resources to innovative activities. Similarly, the work of Aghion et al. (2005) highlights that financial development fosters innovation by reducing credit constraints on companies engaged in technology-intensive activities [26].

Furthermore, the increasing capitalization coefficient implies a non-linear reinforcement process, as the complexity indicators include more complex technological components. In other words, when economies are able to anchor their structural change in the high value-added sectors of the production system, the financial market not only finances complexity, but amplifies it exponentially. This aligns with the findings of Tacchella et al. (2012), who emphasized the importance of productivity filters in determining technological scale and global competitiveness and introduced the Economic Fitness Measure (EFM), an indicator also based on diversification and technological return potential [99].

The consistency of the relationship between capitalization and complexity is evident across all models: capital market depth consistently has a strong and statistically significant impact, regardless of the proxy used to characterize economic transformation. As suggested by endogenous growth models such as that of Aghion et al. (2005), in which financial markets reduce credit constraints and allow firms and governments to invest in education, process innovation, and technological modernization, this provides compelling evidence for the economy-wide complementarities between financial development and structural complexity [26].

Endogeneity Control Using the Lewbel (2012) Method

The estimation using the Lewbel (2012) method, which is used in the table opposite to address potential endogeneity issues in the analysis of the effect of market capitalization on the economic complexity of developing countries, is a crucial robustness test that confirms the validity of the observed causal relationship [94]. The results show that the relationship between market capitalization and the Economic Complexity Index (ECI) remains significant and positive across all specifications, confirming the reliability of the initial results obtained using GMM calculations. To interpret these results, it is necessary to clarify the methodological aspects of Lewbel's (2012) instrumental approach compared to other conventional forms of GMM, particularly regarding the correction of endogenous biases without resorting to external instruments that are difficult to obtain [94].

The existence of endogeneity constitutes a significant obstacle to the validity of causality in economic models used for economic development. In our case, market capitalization can both affect economic complexity and be influenced by it, making the use of traditional panel or cross-sectional estimation methods insufficient and justifying the use of instrumental variables. However, the effectiveness of the method depends largely on the availability of externally validated instruments, that is, those orthogonal to the error and corroborated by the endogenous variable. Moreover, in the context of developing countries, data quality, the lack of adequate valid exogenous tools, and institutional weaknesses make these requirements difficult to meet [100].

In this context, Lewbel's (2012) methodology stands out by providing internal instruments constructed from the heteroscedasticity of the residual errors of the model itself [94]. This method allows for the estimation of causally interpretable relationships even in the absence of reliable external instruments. In conclusion, Lewbel (2012) suggests constructing instruments based on the product of an intersection between the model's exogenous variables and its central residuals. This method relies on the assumption of conditional heteroscedasticity, frequently observed in macroeconomic data from developing countries, and is therefore particularly well-suited to our case study [94]. Using this method, we can correct for endogenous bias while strengthening the empirical identification of the model [94].

The Lewbel method offers significant advantages over the traditional generalized method of moments (GMM), which is based on the GMM system developed by Arellano and Bover (1995) and Blundell and Bond (1998) [56,57]. First, this method can be used even with longer panels and does not rely on strong assumptions about variable dynamics, unlike dynamic GMMs, which require long, stationary panels with potentially weak instruments [60]. Second, GMMs are highly sensitive to instrument proliferation, which can lead to model overidentification, invalidation of Hansen's tests, or p-value inflation in cases of low instrument proliferation [101]. In our case, the J-test (jp) and instrumentation (idstat) statistics appear satisfactory, confirming the relevance and suitability of the instruments derived from conditional noise without the negative effects sometimes associated with GMM instruments.

It is also important to emphasize that the Lewbel method (2012) is rigorous in terms of identification, as shown by our statistics, which indicate all results are significant at the 1% level, demonstrating a high level of validity for the instruments produced. Furthermore, the model effectively uses the internal structure of the data to isolate unfiltered volatility from market capitalization. In this sense, Lewbel's (2012) instruments are not only relevant because of their correlation with the explanatory variable, but they are also legitimate because they are subject to error, which is necessary for correct identification [94,102].

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable : ECI					
Marketcapi	**0.9561*** **	**0.9787*** **	**1.4911*** **	**1.4749*** **	**1.4739*** **	**1.3171*** **
	(0.2414)	**(0.2486)**	**(0.2340)**	**(0.2395)**	**(0.2392)**	**(0.2252)**
GDPpercapita		0.1420**	0.1543**	0.1561***	0.1547**	0.1523**
		(0.0554)	(0.0602)	(0.0602)	(0.0605)	(0.0617)
FDI			-0.0691***	-0.0693***	-0.0679***	-0.0573***
			(0.0166)	(0.0166)	(0.0171)	(0.0175)
Inflation				0.0264	0.0265	0.0252
				(0.0374)	(0.0374)	(0.0356)
Pop_dens					0.0386	0.2010**
					(0.0976)	(0.0841)
GFCF						-0.0553*
						(0.0328)
Constant	-0.0163	-0.0202**	-0.0249**	-0.0255**	-0.0257**	-0.0096
	(0.0103)	(0.0103)	(0.0107)	(0.0106)	(0.0106)	(0.0133)
Observations	1022	1022	1022	1022	1022	1022
R-squared	0.099	0.136	0.350	0.352	0.352	0.4371
jp	0.848	0.792	0.961	0.982	0.984	0.862
idstat	53.69***	53.61***	48.48***	49.14***	48.97***	48.12***
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Source: Authors.						

Table 9: Accounting for Endogeneity Using the Lewbel (2012) Method

The persistence of significant expansion coefficients for the "Marketcapi" variable across the six estimated specifications reinforces the interpretation of a positive causal effect of market capitalization on economic complexity. Furthermore, the progressive increase in R^2 indicates a significant improvement in the model's fit, meaning that additional variables such as gross fixed capital formation (GFCF) or population density effectively capture additional dimensions of variation in economic complexity. This confirms that the central link remains robust and significant, while also strengthening the credibility of the extensible model.

Moreover, this approach is most relevant when used in a context where financial markets act as catalysts for technological progress, capital allocation, and economic diversification in developing countries [37,78]. Indeed, increased investment in high value-added or high-technology industries, factors considered by the ECI, appears to be correlated with a more complex production structure, thanks to increased market capitalization. This includes the return on investment between the size of the national financial market and advanced economic performance, which justifies the use of rigorously identified estimates, such as those of Lewbel (2012) [94].

Robustness to Cross-Sectional Dependencies and Autocorrelation: Driscoll-Kraay Estimator

The application of the Driscoll-Kraay method in this estimation strengthens the robustness of the results against cross-sectional dependency problems in panels and complements the previously conducted analysis on the effect of market capitalization on economic complexity in developing countries. Unlike traditional estimation techniques such as ordinary least squares (OLS) with robust error norms, the White or Newey-West approach, which is often unsuitable for panels with significant time dimensions, modifies the standard errors to account for heteroscedasticity, serial autocorrelation, and cross-sectional correlation between panel units [103]. This adjustment is crucial in the case of developing countries, where exogenous macroeconomic shocks, such as commodity price fluctuations or global financial crises, often affect multiple countries simultaneously, creating modern interdependencies between nations.

	(1)	(2)	(3)	(4)	(5)	(6)
	ECI					
Marketcapi	0.7704**	0.7924**	1.3125***	1.2924***	1.2915***	1.1459***
	(0.3447)	(0.3499)	(0.3351)	(0.3437)	(0.3443)	(0.3038)
GDPpercapita		0.1650*	0.1722	0.1792	0.1782	0.1692
		(0.0893)	(0.1051)	(0.1141)	(0.1145)	(0.1074)
FDI			-0.0710***	-0.0712***	-0.0702***	-0.0596**
			(0.0234)	(0.0236)	(0.0227)	(0.0216)
Inflation				0.0493	0.0494	0.0524
				(0.0551)	(0.0551)	(0.0574)
Pop_dens					0.0269	0.1832
					(0.0993)	(0.1119)
GFCF						-0.0446
						(0.0552)
Constant	-0.0171***	-0.0192***	-0.0276***	-0.0299***	-0.0300***	-0.0170
	(0.0023)	(0.0022)	(0.0020)	(0.0030)	(0.0028)	(0.0147)
Observations	1022	1021	1023	1023	1023	1023
R-squared	0.082	0.131	0.343	0.348	0.349	0.462
N_g	64	64	62	62	62	60
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Source: Authors.						

Table 10: Market Capitalization and Economic Complexity (Driscoll-Kraay Method)

This method relies on least squares estimation with robust, nonparametric "extended Newey-West" error norms and is suitable for medium- to large-scale time panels. It prevents underestimation of the standard error by explicitly accounting for interconnections between panel countries and their respective economic trajectories, which would artificially inflate the statistical significance of the coefficients [104]. Consequently, the results presented in the table opposite show a positive and significant relationship between market capitalization and economic complexity, corroborating previous findings with GMM methods. The empirical robustness of the model is confirmed by the consistent strength of the key link despite rigorous treatment of measurement errors and cross-correlations. Since the Driscoll-Kraay method increases the statistical reliability of the results without changing the estimated structure, it is not only a complementary method, but also essential in integrated macroeconomic panel analyses.

Robustness with Alternative Instrumental Variable methods

The generalized results in Table 11 confirm the existence of a positive and statistically significant impact of market

capitalization on economic complexity in developing countries. The robustness test proposed by various estimation methods using instrumental variables confirms that this relationship is independent of the specific choice of estimator and the specific structure of the instrument.

The use of the approach suggested by Lewbel (2012), as discussed previously, constitutes a crucial first test [94]. This method exploits heteroscedasticity to create internal instruments when external instruments are difficult to find, which is common in macroeconomic analysis of developing countries. The persistence of a positive and significant effect of market capitalization according to this method suggests that the result is not simply due to an unaddressed endogenous problem. Furthermore, the stock market approximation continues to appear as a reliable indicator of productivity levels, even when identification is based on tools created from the error structure.

Two-stage IV-GMM estimates build upon the seminal work of Hansen (1982) on GMMs [105]. This method performs very well in cases of heteroscedasticity and provides useful estimates under generally applicable conditions. The fact that the sign and significance remain constant under IV-GMM2S supports the claim that the observed positive relationship is due to a structural mechanism based on stock market growth and productive diversification rather than on fragile specification.

Historically linked to Trygve Haavelmo, the LIML estimator is renowned for its superior performance when dealing with instruments weaker than the conventional 2SLS. The consistency of the results under IV-LIML implies that the validity of the inference does not depend on the extraordinary power of the instruments. Therefore, market capitalization has a positive effect on the economic complexity index, even in a framework where the risk of weak instruments is explicitly considered. Furthermore, the Continuously Updated Estimator (CUE) also derived from the GMM framework, simultaneously updates the parameters and the weighting matrix, thereby improving asymptotic efficiency. The consistency of the results obtained using this method demonstrates that the identified relationship is not logical for either the optimization process or the choice of the weighting matrix.

The fact that the over-identification tests do not reject the combined validity of the instruments suggests that they are globally exogenous. Moreover, the identification statistics indicate that the instruments are sufficiently informative to explain the exogenous variance of market capitalization.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Lewbel (2012)		IV-GMM2S		IV-Liml		IV-Cue	
VARIABLES	Dependent variable: ECI							
Marketcapi	**0.9561*** **	**1.3171*** **	**0.9673*** **	**1.3260*** **	**0.9561*** **	**1.3171*** **	**0.9676*** **	**1.3260*** **
	(0.2414)	**(0.2252)**	**(0.2342)**	**(0.2193)**	**(0.2414)**	**(0.2252)**	**(0.2347)**	**(0.2200)**
GDPpercapita		0.1523**		0.1519**		0.1523**		0.1519**
		(0.0617)		(0.0617)		(0.0617)		(0.0617)
FDI		-0.0573***		-0.0572***		-0.0573***		-0.0572***
		(0.0175)		(0.0175)		(0.0175)		(0.0175)
Inflation		0.0252		0.0246		0.0252		0.0246
		(0.0356)		(0.0354)		(0.0356)		(0.0356)
Pop_dens		0.2010**		0.2009**		0.2010**		0.2009**
		(0.0841)		(0.0841)		(0.0841)		(0.0841)
GFCF		-0.0553*		-0.0551*		-0.0553*		-0.0551*
		(0.0328)		(0.0328)		(0.0328)		(0.0328)
Constant	-0.0163	-0.0096	-0.0164	-0.0096	-0.0163	-0.0096	-0.0164	-0.0096
	(0.0103)	(0.0133)	(0.0103)	(0.0133)	(0.0103)	(0.0133)	(0.0103)	(0.0133)
Observations	1022	1021	1022	1020	1021	1022	1019	1017
R-squared	0.0099	0.0371	0.0098	0.0371	0.0099	0.0371	0.0098	0.0371
jp	0.848	0.862	0.848	0.862	0.848	0.862	0.848	0.863
idstat	53.69***	48.12***	53.69***	48.12***	53.69***	48.12***	53.69***	48.12***
kclass					1.000	1.000		
lambda					1.000	1.000		

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
Source: Authors.

Table 11: Alternative Instrumental Variable Msethods (Lewbel IV, IV-GMM2S, IV-LIML and IV-CUE)

All these factors support the idea that the observed positive correlation indicates a genuine causal effect rather than a simple correlation. From an economic perspective, the reliability of the results obtained from these different estimation techniques supports the interpretation that market development promotes efficient capital allocation, encourages innovation, and facilitates the reorientation of sectors toward higher value-added activities, all essential mechanisms for creating economic complexity. Overall, the convergence of the IV estimates based on different identification strategies provides strong empirical support for the role of stock markets in structuring the productive transformation of developing countries.

Heterogeneity Analysis Using Quantile Regressions

The quantile regression estimation presented in Table 12 is an important robustness test that allows us to examine whether the positive effect of stock market capitalization on economic complexity is constant across the entire ECI distribution or whether it varies according to the initial level of productivity sophistication of the countries. The method developed by Koenker and Bassett (1978) allows for the estimation of the impact of explanatory factors at different conditional points in the distribution of the dependent variable, unlike traditional mean conditional estimators [106]. It thus offers a more comprehensive understanding of economic mechanisms, which is particularly relevant in the context of developing countries with high structural heterogeneity.

Indeed, observations indicate that stock market capitalization has a positive and statistically significant effect on economic complexity across all quantiles analyzed. This consistency in sign and significance confirms that the link established by the GMM estimates is not only based on average dynamics but is also observable in both low- and high-complexity countries. Robust inter-quantile relationships indicate that stock market developments act as a cross-cutting catalyst for productive transformation, regardless of the level of industrial advancement.

However, the increasing expansion of the effect at higher quantiles suggests a disparity in intensity. In nations that are already quite complex, stock market expansion appears to have a more significant impact on diversification and broadening the range of production. This trend can be understood through the processes of innovation financing and sectoral reallocation: in already diverse production systems, stock markets tend to favor the financing of knowledge-based activities and technology sectors, thereby strengthening existing productive capacities. Conversely, in countries at lower quantiles, the effect remains positive but is generally more modest, which may reflect institutional constraints, shallow financial depth, or a productive structure still dominated by primary sectors.

This approach also has methodological value in terms of its robustness to extreme values and skewed distributions, features often found in international macroeconomic data. As Koenker (2005) indicates, quantile regressions offer the possibility of detecting distinctive effects that might be masked by an estimation based on the conditional mean [107]. In our context, these findings not only validate the main result obtained by GMM, but also enrich its interpretation by demonstrating that the effect of market capitalization increases with the degree of economic complexity.

	(1)	(2)	(3)	(4)	(5)
	Q15	Q25	Q50	Q75	Q90
	Dependent variable: ECI				
Marketcapi	**1.2130*** **	**1.2278*** **	**1.1163*** **	**1.6303*** **	**1.9006*** **
	(0.2881)	**(0.2446)**	**(0.2295)**	**(0.4215)**	**(0.4379)**
GDPpercapita	0.2043***	0.1353**	0.1176**	0.1595	0.0080
	(0.0670)	(0.0568)	(0.0533)	(0.0980)	(0.1018)
FDI	-0.1249***	-0.1249***	-0.1051***	-0.0367	0.0072
	(0.0251)	(0.0213)	(0.0200)	(0.0368)	(0.0382)
Inflation	0.1019*	0.0980*	0.0738	0.0451	-0.0572
	(0.0603)	(0.0512)	(0.0481)	(0.0882)	(0.0917)
Pop_dens	0.6608***	0.4388***	0.2467*	-0.1805	-0.3753
	(0.1683)	(0.1428)	(0.1341)	(0.2462)	(0.2558)
GFCF	-0.1101***	-0.0551	0.0058	-0.0131	0.0750
	(0.0413)	(0.0351)	(0.0329)	(0.0605)	(0.0629)
Constant	-0.0774***	-0.0627***	-0.0335***	0.0339**	0.0956***
	(0.0104)	(0.0088)	(0.0083)	(0.0152)	(0.0158)
Observations	1023	1023	1023	1023	1023
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Source: Authors.					

Table 12: Quantile Estimations

Consequently, the agreement between the results from the average estimates (GMM and IV) and those from the estimates based on the distribution (quantile regressions) significantly strengthens the empirical validity of the identified positive link. It indicates that the structuring role of financial markets in the productive transformation of developing countries is neither occasional nor limited to a specific group of countries, but rather represents a robust and widespread mechanism, with an intensity that varies according to the country's position in the complexity distribution.

Conclusion

The analysis conducted on a panel of 65 developing countries between 1995 and 2023 reveals a robust and economically significant relationship between market capitalization and economic complexity. This period, spanning nearly three decades, includes phases of accelerated globalization, regional and global financial crises, and sustained efforts toward regional economic integration, particularly in Africa and Latin America. The temporal and geographical diversity of the sample lends the results broad analytical scope, allowing for cautious yet robust generalization of the conclusions. The findings consistently demonstrate that stock market capitalization acts as a significant lever for productive transformation. By facilitating the mobilization of long-term capital, strengthening corporate transparency and governance, and stimulating innovation through appropriate financial incentive mechanisms, stock markets position themselves as essential catalysts for economic complexity. They enable economies to move toward more technologically sophisticated sectors, thereby fostering the development of more advanced productive capacities and structural diversification.

Empirical results obtained using various econometric specifications, such as the GMM-System, the traditional IV-GMM, and Lewbel's method (2012), confirm the statistical significance and robustness of the observed link, even when varying the measures of economic complexity (ECI, ECI+, ECI_Trade, ECI_Technology, and ECI_research) and controlling for regional effects. This methodological robustness validates the causal plausibility of the phenomenon and constitutes a major contribution to the literature on structural transformation and the role of market finance in economic development. However, the positive effects of market capitalization are not universal and are highly dependent on the economic, institutional, and sociocultural context. Economies with strong financial institutions, a stable state apparatus, an effective judicial system, and high social cohesion derive a significant benefit from their market capitalization. Conversely, in countries dominated by natural resources, where ethnic or religious fragmentation is strong, or where institutions are weak, the positive effect is limited or even neutralized. This heterogeneity underscores the need for an enabling environment for stock market capitalization to become a genuine driver of transformation.

Based on these findings, several economic policy recommendations emerge. Strengthening institutions to ensure transparency, investor protection, and market governance is crucial. Capital allocation policies should be geared toward sectors with high technological added value and positive productive externalities. Effective financial market regulation is also necessary to prevent speculative bubbles and guarantee macroeconomic stability. Furthermore, developing human capital, in line with the needs of complex industries, is a key factor in amplifying the effects of stock market capitalization on economic complexity.

At the national level, governments must create a stable macro-financial environment, modernize the productive fabric, and strengthen legal and regulatory frameworks. At the regional and continental levels, the coordination of financial policies within integration frameworks such as the African Union, MERCOSUR, and ASEAN is essential to reduce market fragmentation, create sufficiently large financial ecosystems, and achieve the critical mass necessary to finance major infrastructure projects. These policies must be integrated into coherent development strategies, ranging from national plans to continental programs, to maximize their impact on economic complexity.

Finally, this study opens up future avenues for research and action. Future work could explore the specific channels through which market capitalization influences economic transformation, as well as the potentially non-linear nature of this relationship. Analyzing the mediating effects of innovation, regional financial integration, and sectoral diversification will provide a better understanding of the conditions for the success of financial markets in developing countries. The strategic objective remains to transform stock markets into active instruments of structural development, capable of fostering sustainable economic complexity and positioning emerging economies as major players in the 21st-century global economy.

References

1. McMillan, M., Rodrik, D., & Verduzco-Gallo, Í. (2014). Globalization, structural change, and productivity growth, with an update on Africa. World development, 63, 11-32.
2. Lin, J. Y., & Monga, C. (2017). Beating the odds: Jump-starting developing countries.
3. Arcand, J. L., Berkes, E., & Panizza, U. (2015). Too much finance?. Journal of economic growth, 20(2), 105-148.
4. Cihak, M. M., & Sahay, M. R. (2020). Finance and inequality. International Monetary Fund.
5. Hausmann, R., Hidalgo, C. A., Bustos, S., Coscia, M., & Simoes, A. (2014). The atlas of economic complexity: Mapping paths to prosperity. Mit Press.
6. Hartmann, D., Guevara, M. R., Jara-Figueroa, C., Aristarán, M., & Hidalgo, C. A. (2017). Linking economic complexity, institutions, and income inequality. World development, 93, 75-93.
7. Mealy, P., & Teytelboym, A. (2022). Economic complexity and the green economy. Research Policy, 51(8), 103948.
8. Majeed, M. A., Yan, C., & Tauni, M. Z. (2018). How does competition shape managerial decisions? Product market

competition and financial statement comparability. Management Decision, 56(11), 2437-2471.
9. Hsu, P. H., Tian, X., & Xu, Y. (2014). Financial development and innovation: Cross-country evidence. Journal of financial economics, 112(1), 116-135.
10. Kharroubi, S. G. (2015). Why does financial sector growth crowd out real economic growth. Bank for International Settlements.
11. Dabla-Norris, M. E., & Srivisal, M. N. (2013). Revisiting the link between finance and macroeconomic volatility. International Monetary Fund.
12. Rodrik, D. (2018). New technologies, global value chains, and developing economies (No. w25164). National Bureau of Economic Research.
13. Mazzucato, M. (2021). Mission economy: A moonshot guide to changing capitalism. Penguin UK.
14. Acemoglu, D. (2009). Introduction to modern economic growth. Princeton University Press, Princeton, New Jersey, United States, ISBN 978-0691132921.
15. Aghion, P., & Howitt, P. (2009). The Economics of Growth (Vol. 1). The MIT Press.
16. Rodrik, D. (2016). Premature deindustrialization. Journal of economic growth, 21(1), 1-33.
17. Aghion, P., Antonin, C., & Bunel, S. (2023). Le pouvoir de la destruction créatrice: Innovation, croissance et avenir du capitalisme. Hors collection, 113-113.
18. Epstein, G. (2019). The political economy of central banking: contested control and the power of finance, selected essays of gerald epstein. Edward Elgar Publishing.
19. Lapavitsas, C., & Soydan, A. (2022). Financialisation in developing countries: approaches, concepts, and metrics. International Review of Applied Economics, 36(3), 424-447.
20. Levine, R., & Zervos, S. (1998). Stock markets, banks, and economic growth. American economic review, 537-558.
21. Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: Panel evidence. Journal of Banking & Finance, 28(3), 423-442.
22. Rajan, R. G., & Zingales, L. (1998). Financial dependence and growth. The American Economic Review, 88(3), 559.
23. Bencivenga, V. R., & Smith, B. D. (1991). Financial intermediation and endogenous growth. The review of economic studies, 58(2), 195-209.
24. Beck, T., Levine, R., & Loayza, N. (2000). Finance and the Sources of Growth. Journal of financial economics, 58(1-2), 261-300.
25. Demirgüç-Kunt, A., & Goldsmith, R. W. (2001). Perspectives and Lessons. Financial structure and economic growth: A cross-country comparison of banks, markets, and development, 1.
26. Aghion, P., Howitt, P., & Mayer-Foulkes, D. (2005). The effect of financial development on convergence: Theory and evidence. The quarterly journal of economics, 120(1), 173-222.
27. Acemoglu, D., & Zilibotti, F. (1997). Was Prometheus unbound by chance? Risk, diversification, and growth. Journal of political economy, 105(4), 709-751.
28. Pagano, M., & Pica, G. (2012). Finance and employment. Economic Policy, 27(69), 5-55.
29. Odhiambo, N. (2010, June). Stock market development and economic growth in South Africa: An ARDL-bounds testing approach. In A paper presented at the Annual American Business Research Conference, Las Vegas, Nevada, USA (Vol. 8).
30. Sharma, S., & Sharma, S. K. (2020). Financial development and economic growth in selected Asian economies: A dynamic panel ARDL test. Contemporary Economics, 201-218.
31. Ayadi, R., Arbak, E., Naceur, S. B., & De Groen, W. P. (2014). Financial development, bank efficiency, and economic growth across the Mediterranean. In Economic and social development of the Southern and Eastern Mediterranean countries (pp. 219-233). Cham: Springer International Publishing.
32. Durusu-Ciftci, D., Ispir, M. S., & Yetkiner, H. (2017). Financial development and economic growth: Some theory and more evidence. Journal of policy modeling, 39(2), 290-306.
33. Soumtang Bime, V., Mignamissi, D., & Koumis Ngagni, A. C. (2024). Does financial openness matter for economic transformation in sub-Saharan Africa?. Economic Change and Restructuring, 57(2), 19.
34. La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1997). Legal determinants of external finance. The journal of finance, 52(3), 1131-1150.
35. Rodrik, D., & Subramanian, A. (2009). Why did financial globalization disappoint?. IMF staff papers, 56(1), 112-138.
36. Levine, R. (1997). Financial development and economic growth: views and agenda. Journal of economic literature, 35(2), 688-726.
37. Levine, R. (2005). Finance and growth: theory and evidence. Handbook of economic growth, 1, 865-934.
38. Demirguc-Kunt, A. (2008). Finance, financial sector policies, and long-run growth.
39. Kose, M. A., Prasad, E., Rogoff, K., & Wei, S. J. (2009). Financial globalization: A reappraisal. IMF Staff papers, 56(1), 8-62.
40. Fry, M. J. (1997). In favour of financial liberalisation. The economic journal, 107(442), 754-770.
41. Bekaert, G., & Harvey, C. R. (2000). Foreign speculators and emerging equity markets. The journal of finance, 55(2), 565-613.
42. Chinn, M. D., & Ito, H. (2006). What matters for financial development? Capital controls, institutions, and interactions. Journal of development economics, 81(1), 163-192.
43. Calvo, G. A., Izquierdo, A., & Mejia, L. F. (2004). On the empirics of sudden stops: the relevance of balance-sheet effects.
44. Borio, C., & Zhu, H. (2012). Capital regulation, risk-taking and monetary policy: a missing link in the transmission

mechanism?. Journal of Financial stability, 8(4), 236-251.
45. Gertler, M., & Gilchrist, S. (1994). Monetary policy, business cycles, and the behavior of small manufacturing firms. The quarterly journal of economics, 109(2), 309-340.
46. Dyck, A., & Zingales, L. (2004). Private benefits of control: An international comparison. The journal of finance, 59(2), 537-600.
47. Rodrik, D. (1991). Policy uncertainty and private investment in developing countries. Journal of development economics, 36(2), 229-242.
48. Ioannou, S., & Wójcik, D. (2019). On financialization and its future. Environment and Planning A: Economy and Space, 51(1), 263-271.
49. Demirgüç-Kunt, A., & Levine, R. (1996). Stock markets, corporate finance, and economic growth: an overview. The World Bank Economic Review, 10(2), 223-239.
50. Levine, R., & Zervos, S. (1996). Stock market development and long-run growth. The world bank economic review, 10(2), 323-339.
51. Ewah, S. O., Esang, A. E., & Bassey, J. U. (2009). Appraisal of capital market efficiency on economic growth in Nigeria. International Journal of Business and Management, 4(12), 219-225.
52. Hidalgo, C. A., & Hausmann, R. (2009). The building blocks of economic complexity. Proceedings of the national academy of sciences, 106(26), 10570-10575.
53. Fischer, S. (1993). The role of macroeconomic factors in growth. Journal of monetary economics, 32(3), 485-512.
54. Bruno, M., & Easterly, W. (1998). Inflation crises and long-run growth. Journal of Monetary economics, 41(1), 3-26.
55. Shahabadi, A., & Pouran, R. (2024). Exploring the interaction of population, globalization, and institutional factors for achieving economic complexity in D8 countries. Journal of the Knowledge Economy, 15(2), 8077-8096.
56. Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. Journal of econometrics, 68(1), 29-51.
57. Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. Journal of econometrics, 87(1), 115-143.
58. Nickell, S. (1981). Biases in dynamic models with fixed effects. Econometrica: Journal of the econometric society, 1417-1426.
59. Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. The review of economic studies, 58(2), 277-297.
60. Roodman, D. (2009). A note on the theme of too many instruments. Oxford Bulletin of Economics and statistics, 71(1), 135-158.
61. World Bank (2024). World Bank World Development Indicators. In Encyclopedia of Quality of Life and Well-Being Research (pp. 7858-7858). Cham: Springer International Publishing.
62. Nguyen, C. P., Schinckus, C., & Su, T. D. (2020). The drivers of economic complexity: International evidence from financial development and patents. International Economics, 164, 140-150.
63. Ndoya, H., Ongo Nkoa, B. E., Kemeze, F. H., & Nchofoung, T. N. (2024). Financial development and economic complexity: The role of country stability. Economics of Transition and Institutional Change, 32(2), 415-447.
64. Rodrik, D. (2014). The past, present, and future of economic growth. Challenge, 57(3), 5-39.
65. Alfaro, L. (2003). Foreign direct investment and growth: Does the sector matter. Harvard Business School, 2003, 1-31.
66. Aitken, B. J., & Harrison, A. E. (1999). Do domestic firms benefit from direct foreign investment? Evidence from Venezuela. American economic review, 89(3), 605-618.
67. Nguea, S. M. (2024). Does demographic dividend enhance economic complexity: The mediating effect of human capital, ICT, and foreign direct investment. Journal of the Knowledge Economy, 15(4), 19678-19699.
68. Auty, R. M. (1994). Industrial policy reform in six large newly industrializing countries: The resource curse thesis. World development, 22(1), 11-26.
69. Sachs, J. D., & Warner, A. M. (1999). The big push, natural resource booms and growth. Journal of development economics, 59(1), 43-76.
70. Bhattacharyya, S., & Hodler, R. (2014). Do natural resource revenues hinder financial development? The role of political institutions. World Development, 57, 101-113.
71. Erdoğan, S., Yıldırım, D. Ç., & Gedikli, A. (2020). Natural resource abundance, financial development and economic growth: an investigation on Next-11 countries. Resources Policy, 65, 101559.
72. Chebab, D., Mazlan, N. S., Rabbani, M. R., Chin, L., & Ogiri, A. I. (2022). The role of corruption in natural resource-financial development nexus: evidence from MENA region. Institutions and Economies, 1-29.
73. Christensen, C. M. (1997). The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail. University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship.
74. Chami, R., Fullenkamp, C., & Jahjah, S. (2005). Are immigrant remittance flows a source of capital for development?. IMF Staff papers, 52(1), 55-81.
75. Giuliano, P., & Ruiz-Arranz, M. (2009). Remittances, financial development, and growth. Journal of development economics, 90(1), 144-152.
76. Beck, T., & Levine, R. (2002). Industry growth and capital allocation:: does having a market-or bank-based system matter?. Journal of financial economics, 64(2), 147-180.
77. Ayyagari, M., Demirgüç-Kunt, A., & Maksimovic, V. (2011). Small vs. young firms across the world: contribution to

employment, job creation, and growth. World Bank policy research working paper, (5631).
78. King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. The quarterly journal of economics, 108(3), 717-737.
79. Pagano, M. (1993). Financial markets and growth: An overview. European economic review, 37(2-3), 613-622.
80. Estrada, G. B., Park, D., & Ramayandi, A. (2010). Financial development and economic growth in developing Asia. Asian Development Bank Economics Working Paper, (233).
81. Laeven, L., & Levine, R. (2008). Complex ownership structures and corporate valuations. The Review of Financial Studies, 21(2), 579-604.
82. Demirgüç-Kunt, A., & Maksimovic, V. (1998). Law, finance, and firm growth. The journal of finance, 53(6), 2107-2137.
83. De la Torre, A., Gozzi, J. C., & Schmukler, S. L. (2008). Capital market development: whither Latin America?. In Financial markets volatility and performance in emerging markets (pp. 121-154). University of Chicago Press.
84. Bittencourt, M. (2012). Inflation and economic growth in Latin America: Some panel time-series evidence. Economic Modelling, 29(2), 333-340.
85. Malik, A., & Awadallah, B. (2013). The economics of the Arab Spring. World Development, 45, 296-313.
86. North, D. C. (1990). Institutions, institutional change and economic performance. Cambridge university press.
87. Hofstede, G. (2001). Culture's consequences: Comparing values, behaviors, institutions and organizations across nations. International Educational and Professional.
88. Rodrik, D., Subramanian, A., & Trebbi, F. (2004). Institutions rule: the primacy of institutions over geography and integration in economic development. Journal of economic growth, 9(2), 131-165.
89. Iqbal, Z., & Mirakhor, A. (2011). An introduction to Islamic finance: Theory and practice. John Wiley & Sons.
90. Weber, M. (2013). L'éthique protestante et l'esprit du capitalisme. Presses éléctroniques de France.
91. Tabellini, G. (2010). Culture and institutions: economic development in the regions of Europe. Journal of the European Economic association, 8(4), 677-716.
92. Aghion, P., Algan, Y., Cahuc, P., & Shleifer, A. (2010). Regulation and distrust. The Quarterly journal of economics, 125(3), 1015-1049.
93. Treisman, D. (2000). The causes of corruption: a cross-national study. Journal of public economics, 76(3), 399-457.
94. Lewbel, A. (2012). Using heteroscedasticity to identify and estimate mismeasured and endogenous regressor models. Journal of business & economic statistics, 30(1), 67-80.
95. Albeaik, S., Kaltenberg, M., Alsaleh, M., & Hidalgo, C. A. (2017). Improving the economic complexity index. arXiv preprint arXiv:1707.05826.
96. Hidalgo, C. A., Klinger, B., Barabási, A. L., & Hausmann, R. (2007). The product space conditions the development of nations. Science, 317(5837), 482-487.
97. Hausmann, R., Hwang, J., & Rodrik, D. (2007). What you export matters. Journal of economic growth, 12(1), 1-25.
98. Archibugi, D., & Coco, A. (2004). A new indicator of technological capabilities for developed and developing countries (ArCo). World development, 32(4), 629-654.
99. Tacchella, A., Cristelli, M., Caldarelli, G., Gabrielli, A., & Pietronero, L. (2012). A new metrics for countries' fitness and products' complexity. Scientific reports, 2(1), 723
100. Acemoglu, D., Johnson, S., Robinson, J., & Thaicharoen, Y. (2003). Institutional causes, macroeconomic symptoms: volatility, crises and growth. Journal of monetary economics, 50(1), 49-123.
101. Clemens, M. A., & Bazzi, S. (2009). Blunt instruments: On establishing the causes of economic growth. Center for Global Development Working Paper, (171).
102. Wooldridge, J. M. (2010). Econometric analysis of cross section and panel data. MIT press.
103. Driscoll, J. C., & Kraay, A. C. (1998). Consistent covariance matrix estimation with spatially dependent panel data. Review of economics and statistics, 80(4), 549-560.
104. Hoechle, D. (2007). Robust standard errors for panel regressions with cross-sectional dependence. The stata journal, 7(3), 281-312.
105. Hansen, L. P. (1982). Large sample properties of generalized method of moments estimators. Econometrica: Journal of the econometric society, 1029-1054.
106. Koenker, R., & Bassett Jr, G. (1978). Regression quantiles. Econometrica: journal of the Econometric Society, 33-50.
107. Koenker, R. (2005). Quantile regression [M]. Econometric Society Monographs, Cambridge University Press, Cambridge.
108. Beck, T., Demirgüç-Kunt, A., & Levine, R. (2007). Finance, inequality and the poor. Journal of economic growth, 12(1), 27-49.
109. Ioannou, S., & Wójcik, D. (2023). Income inequality, finance, and space: A cross-country analysis. Global Perspectives, 4(1), 89327.
110. Shi, X., & Shi, Y. (2022). Unpacking the process of resource allocation within an entrepreneurial ecosystem. Research Policy, 51(9), 104378.