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Emerging Economies' Institutional Quality and International Competitiveness: A PLS-SEM Approach

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Abstract: The home country's institutional framework determines the capacity to compete in the global arena. This paper discusses the linkage between institutional quality (IQ) and international competitiveness (IC). We measured institutions' quality in emerging economies through the use of selected indicators between 2007–2017. To evaluate the proposed IQ constructs and their relationship with IC, we applied partial least squares – structural equation modeling (PLS-SEM) analysis. The model outcomes suggest that political and lack of systemic conditions have a significant and negative effect on international competitiveness, while science, technology, engineering and mathematics (STEM) resource conditions have a significant and positive effect.

Keywords: institutional quality; international competitiveness; emerging economies; PLS-SEM



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1. Introduction

This study is aimed to empirically explore the role of home country institutional quality on international competitiveness [1–6]. Past studies have used traditional econometric models and variables to measure institutions' effect on international competitiveness [2]. To fill in gaps and expand previous studies, this paper analyzes the influence of different institutional conditions on emerging economies' competitiveness. This paper selects several quantitative proxies to determine the institutional quality and its relationships in the process of international competition. We follow the partial least squares-structural equation modeling (PLS-SEM) method to conduct this analysis.

There are various measures of the concept of International Competitiveness. One is proposed by Sachs, focused on macro indicators defined as “the set of institutions and economic policies supportive of high rates of economic growth in the medium term.” Another, proposed by Porter, focused on microeconomic indicators to measure the “set of institutions, market structures, and economic policies supportive of high current levels of prosperity” [7]. A third approach looks at “the capability of firms engaged in value-added activities in a specific industry in a particular country to sustain this value-added over long periods in spite of international competition” [8] (p. 139). The last approach, proposed by the OECD (Organization for Economic Cooperation and Development), argues that “competitiveness is the degree to which a nation can, under free trade and fair market conditions, produce goods and services, which meet the test of international markets, while simultaneously maintaining and expanding the real income of its people over the long-term” [9].

Over the last decade, authors, reviewers, and editors have universally accepted PLS-SEM as a multivariate analysis method. A search in specialized data bases for the term “partial least squares path modeling” reveals that it has assisted researchers in empirically validating their theoretical project developments in various disciplines, such as accounting,

family business, management information systems, operations management, supply chain, and many others [10–14].

According to the literature review, our paper is the first approach to study the interplay between institutional quality and international competitiveness in emerging economies using PLS-SEM. It also extends the use of PLS-SEM to the field of international business and international political economy by the use and combination of alternative data sources to explain the proposed constructs [2,15,16].

This paper is structured as follows. Section 2 briefly describes the literature review and hypothesis development. Section 3 details the methodological structure. Section 4 presents the results and discussion. Sections 5 and 6 present the conclusions, contributions, limitations, and future research directions.

2. Literature Review and Hypothesis Development on Institutional Quality and International Competitiveness

The modern economy institutions must be taken into account when thinking about economic growth and prosperity. North [15] argues that consistent, dependable institutions are necessary for the modern economic system's overall functioning. Institutions provide a defined legal system, a structured judicial system to enforce property rights and settle disputes, and a contracting and trading system that reduces firms' transaction costs [15,16].

While some institutions are more mature than others, the majority of them are underdeveloped in emerging economies. Lack of institutional development in the country has been examined in the literature to be a cause of macroeconomic volatility and can be accounted for by the adverse effects on economic growth and prosperity [17–21].

North's work [22] has been the basis for further studies that has influenced literature in growth, internationalization, and competitiveness. Another noteworthy contribution was the origin of the "institutional framework" construct that emerged in literature featured in the works of Acemoglu [17–19,23–25], which is understood to be the basis of economic transformation.

The institutional framework is determined by the quality of the institutions, both inclusive and extractive. Inclusive economic institutions create inclusive markets, while "extractive economic institutions are designed to extract incomes and wealth from one subset of society to benefit a different subset" [19].

On the other hand, the academic debate on international competitiveness focuses on the lack of a generally accepted theory on the roots of international competitiveness [26]. Summarizing the academic approaches to competitiveness:

- Technology and production capacity are more important for economic growth than cost competitiveness [27].
- International competitiveness boils down to the discussion on international trade [28].
- International competitiveness is a matter of export performance with technological capacities [8,29–35].
- International competitiveness is based on regulations and policy frameworks [36–43].

Graham and Naim [44] identified three types of institutional functions. The first is the development of rules and laws. Institutions that fall into this category are legislative, ministries, municipal councils, and related agencies. The second category of the institutional role is the application and award of rules and laws. The institutions involved here are tribunals, boards, control, and regulatory bodies. The third institutional role is the supply of public services. These are the institutions that guarantee the provision of different types of public goods and services.

There are many explanations for institutional quality that could be classified into three categories for analysis [44]:

- Resource conditions: related to the quantity, quality, and allocation of available resources.
- Political conditions: related to co-optation, corruption, and politicization in the allocation of resources.

- Systemic conditions: related to the clarity in setting long-term goals, the concentration of power in economic agents, and external state intervention.

Thus, we wanted to understand what the various institutional quality dimensions encourage international competitiveness and deter it. Due to the firm's interaction with a wide range of stakeholders, including political and social actors, they are dependent on the institutional environment in which they operate. Regulatory and normative pressures exist in a business environment, which causes firms' particular behavior [45,46]. Factors like government stability, political parties, predictability of the legal system, and contractual enforcement determine economic outcomes and internationalization [47–51]. The above arguments lead to our first hypothesis.

Hypothesis 1 (H1). *A lower degree of political conditions has a negative effect on international competitiveness.*

Porter [41] identifies the nation's competitive advantage due to the quality of endogenous variables like demand conditions, complementary industries, strategy, structure, and rivalry. The country's competitiveness is determined by resource allocation, including human capital, that helps create economic development.

The pace of economic growth is highly dependent on innovation [52]. Economic progress is made possible through technological innovation and development. New or improved technology can be developed through invention and innovation and foreign technology absorption. Allowing for such technological advances requires adequate institutions and policies to support them. It means that an economy's competitiveness relies on how well government policy can support it [53]. The nature and pace of economic growth depend on the degree of institutions and systemic factors that support technological advancements [54,55].

Technology and human capital are interdependent, inseparable, and essential. A large part of technological progress is a result of investing in human capital. In the absence of skilled workers, machines, tools, scientific instruments, the legal system, financial system, and most modern society would not function. To develop more technology, it is necessary to create and maintain skilled employees. To better utilize technology and human capital, society needs technical and business skills [56,57]. Hence, we propose the next hypothesis.

Hypothesis 1 (H2). *Science, technology, engineering, and mathematics (STEM) resources enhance international competitiveness.*

Individual property rights and property-based capitalism are vital elements to entrepreneurship. As private property becomes less prevalent or concentrated in a small elite's hands, it becomes more extractive and undermines broader economic growth [17,58]. Political restraint leads to a pattern of captured democracy in which the game's rules favor the elite [59].

A country's legal infrastructure's capacity to resolve disputes and enforce contracts motivates firms to rely on it [60]. For Kramer [61], rules are based on the ability to predict institutional action. "At the country-level, trust in country's laws is reflected in confidence in their country's legal system" [62,63]. Based on the specific application, rule-based trust is expected to reduce transaction costs and guide organizational strategic choices [64,65]. We, thus, hypothesize that:

Hypothesis 1 (H3). *Lack of structural systemic conditions have a negative effect on international competitiveness.*

3. Methodology

The problem intended to analyze is the institutional framework and how it affects international competitiveness. International competitiveness is affected when a country's

“rules of the game” generate present and future uncertainty and question the economy’s perceived potential productive capacity.

The aim is to analyze the period of 2007–2017 in 48 emerging economies given the changes in these regions’ institutional conditions during that period (see Table 1). The selected countries are classified as emerging economies because they are moving from an informal institutional system to a more formal structure with rules of the game that are transparent and apply equally to all participants in the market. Besides, they often experience faster economic growth as measured by gross domestic product (GDP) and improvement in infrastructure and market conditions. However, there is still a higher risk due to political instability, domestic infrastructure problems, currency volatility, and limited equity opportunities.

Table 1. Countries included in the study.

Region	Countries
Latin America and the Caribbean	Argentina, Brazil, Chile, Colombia, Jamaica, Mexico, Peru, and Venezuela
Europe	Bulgaria, Croatia, Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia, Serbia, and Ukraine
Asia	Bangladesh, China, India, Indonesia, Kazakhstan, Malaysia, Pakistan, the Philippines, Russia, Sri Lanka, Thailand, and Vietnam
Africa	Kenya, Nigeria, Namibia, South Africa, Uganda, and Zambia
MENA	Egypt, Jordan, Kuwait, Morocco, Qatar, Tunisia, Turkey, and the United Arab Emirates

Source: Author’s elaboration.

We propose three latent variables: political (POL), resources (RES), and systemic conditions (SYS), to measure institutional quality and its impact in a fourth latent variable named international competitiveness (IC). Figure 1 shows the basic model.

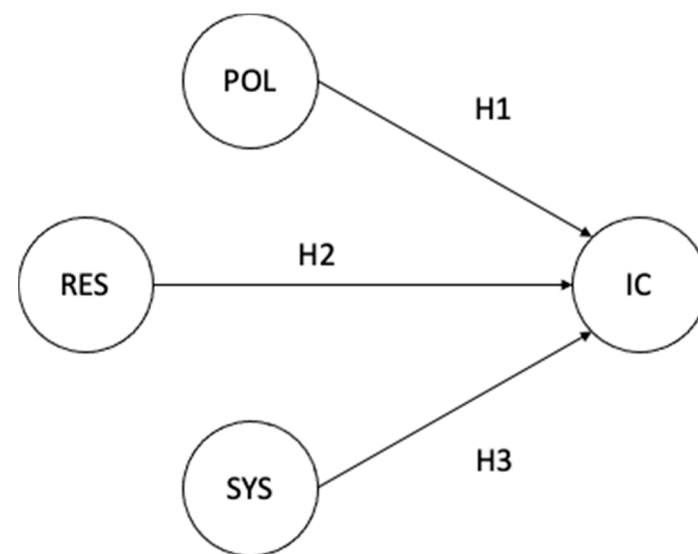


Figure 1. Institutional Quality and International Competitiveness-Basic Model. Source: Author’s elaboration.

3.1. Sources and Measures

To test the proposed hypotheses, alternative reliable secondary data sources were utilized [2]. We collected indicators from the Fragile States Index (FSI) [66], from the Global Competitiveness Index (GCI) [67], from the International Country Risk Guide (ICRG) [68], and from the Index of Economic Freedom (IEF) [69]. Table 2 summarizes the structure and scales of each source.

Table 2. Data sources and scales.

Index	Categories/Pillars	Indicators	Scale	
			High	Low
GCI	Basic requirements	Institutions, infrastructure, macroeconomic environment, and health and primary education.	7	1
	Efficiency enhancers	Goods, labor, and financial markets, higher education and training, and technological readiness.	7	1
	Innovation and sophistication	Business sophistication and innovation.	7	1
FSI	Cohesion	Security apparatus, factionalized elites, and group grievance.	1	10
	Economic	Economic decline, uneven economic development, and human flight and brain drain.	1	10
	Political	State legitimacy, public services, and human rights and rule of law	1	10
	Social and cross-cutting indicators	Demographic pressures, refugees and IDPs (Internal Displaced People), and external intervention	1	10
EFI	Rule of law	Property rights, government integrity, judicial effectiveness	100	0
	Government Size	Government spending, tax burden, fiscal health	100	0
	Regulatory efficiency	Business freedom, labor freedom, monetary freedom	100	0
	Open markets	Trade freedom, investment freedom, financial freedom	100	0
ICRG	Government stability	Government unity, legislative strength, popular support	12	0
	Socioeconomic conditions	Unemployment, consumer confidence, poverty	12	0
	Investment profile	Contract viability/expropriation, profits repatriation, payment delays	12	0
	Internal conflict	Civil war/coup threat, terrorism/political violence, civil disorder	12	0
	External conflict	War, cross-border conflict, foreign pressures	12	0
	Corruption	Special payments and bribes	6	0
	Military in politics	Domination of society and/or governance by military forces	6	0
	Religious tensions	Domination of society and/or governance by a single religious group	6	0
	Law and order	Strength and impartiality of the legal system, observance of the law	6	0
	Ethnic tensions	Tension within a country attributable to racial, nationality, or language divisions	6	0
	Democratic accountability	Government's responsiveness to its people	6	0
	Bureaucracy quality	Institutional strength to govern without drastic changes in policy or interruptions in government services	6	0

Source: Author's elaboration based on the respective source.

A country's productive structure results from its level of social capital and the quality of its institutions. Research has shown that the complexity and the diversity of products a nation exports are a reliable indicator of the resources available in the economy. Complex products require a great deal of tacit knowledge and entail more distributed knowledge than those produced with a product based on resource richness or low labor costs [31,70–72]. In a world where economic power is indicative of political power, economies characterized by narrow resource endowment are more susceptible to capture due to economic and political corruption. Hence, we selected the economic complexity index (ECI) (<http://atlas.cid.harvard.edu>, accessed on 12 January 2021), developed by Hausmann and Hidalgo [73] as the proxy to measure international competitiveness (IC).

3.2. Constructs and Indicators

From the mentioned sources, we selected specific indicators related to the meaning of the proposed constructs. In Table 3, we describe each construct's composition. Table A1 shows the descriptions of the indicators.

Table 3. Indicators and constructs.

Indicator		Description	Construct		Source
efi_pr	X ₁	Property rights			Index of Economic Freedom
gci_dpf	X ₂	Diversion of public funds			Global Competitiveness Index
gci_ipp	X ₃	Intellectual property protection	POL	Y ₁	Global Competitiveness Index
icrg_corr	X ₄	Corruption			International Country Risk Guide
icrg_lwo	X ₅	Law and order			International Country Risk Guide
gci_art	X ₆	Availability of research and training services			Global Competitiveness Index
gci_ftf	X ₇	FDI (Foreign Direct Investment) and technology transfer			Global Competitiveness Index
gci_qes	X ₈	Quality of the education system	RES	Y ₂	Global Competitiveness Index
gci_qms	X ₉	Quality of math and science education			Global Competitiveness Index
gci_qri	X ₁₀	Quality of scientific research institutions			Global Competitiveness Index
gci_uic	X ₁₁	University-industry collaboration in R&D			Global Competitiveness Index
fsi_bd	X ₁₂	Human flight and brain drain			Fragile States Index
fsi_fe	X ₁₃	Factionalized elites			Fragile States Index
fsi_gg	X ₁₄	Group grievance	SYS	Y ₃	Fragile States Index
fsi_sl	X ₁₅	State legitimacy			Fragile States Index
eci	X ₁₆	Economic complexity	IC	Y ₄	Economic Complexity Index

Source: Author's elaboration.

3.3. Method

The study opted for structural equation modeling (SEM) because of its ability to model all paths at once. We choose Partial Least Square (PLS-SEM) instead of covariance-based (CB-SEM) for the following reasons: (1) PLS has minimal restrictions on measurement scales, sample size, and residual distributions, (2) PLS analysis does not assume that the variables are truly independent, leading to more reliable results, and (3) PLS is robust against data skewness and omitting an independent variable [11,74–81].

The literature regarding international business research shows the increasing complexity in the research problems and models observed due to the contemporary interaction

between established theories and data availability [82–84]. PLS-SEM is regarded as one of the most innovative approaches in international fields that are very difficult to understand. The method proves particularly valuable for exploratory purposes and is considered proper to explain intricate relationships, like those arising from institutions and global competition [85,86].

Data were assessed using SmartPLS [87] to help determine the relationship between the latent variables POL, RES, and SYS as indicators of institutional quality and their impact on international competitiveness (IC).

Variables have been modeled as reflective constructs since the indicators are expected to covary with each other. The indicators share the same theme in the reflective model. Therefore, indicators must have the same antecedents and consequences [88,89].

Model Specification

Our model consists of 16 indicators ($X_1, X_2, X_3, \dots, X_{16}$) and four latent variables (Y_1, Y_2, Y_3, Y_4). Latent variables Y_1, Y_2, Y_3 influence Y_4 , and the measurement model is specified as follows:

$$X_1 = Y_1C_1 + \varepsilon_1$$

$$X_2 = Y_1C_2 + \varepsilon_2$$

$$X_3 = Y_1C_3 + \varepsilon_3$$

$$X_4 = Y_1C_4 + \varepsilon_4$$

$$X_5 = Y_1C_5 + \varepsilon_5$$

$$X_6 = Y_2C_6 + \varepsilon_6$$

$$X_7 = Y_2C_7 + \varepsilon_7$$

$$X_8 = Y_2C_8 + \varepsilon_8$$

$$X_9 = Y_2C_9 + \varepsilon_9$$

$$X_{10} = Y_2C_{10} + \varepsilon_{10}$$

$$X_{11} = Y_2C_{11} + \varepsilon_{11}$$

$$X_{12} = Y_3C_{12} + \varepsilon_{12}$$

$$X_{13} = Y_3C_{13} + \varepsilon_{13}$$

$$X_{14} = Y_3C_{13} + \varepsilon_{13}$$

$$X_{15} = Y_3C_{15} + \varepsilon_{15}$$

$$X_{16} = Y_4C_{16} + \varepsilon_{16}$$

In our model, X 's are the indicators, Y 's are the latent variables, C 's are the loadings that relate latent variables to indicators, and ε 's are the residuals of indicators that are unexplained. All indicators are considered reflective in our measurement model because each is assumed to affect the corresponding latent variable. As a result, all endogenous variables are observed.

The measurement model can be generally written as follows:

$$X = C'Y + \varepsilon \quad (1)$$

In the measurement (outer) model, X is a J by 1 vector of all indicators, Y is a P by 1 vector of all latent variables, C is a P by the J matrix of loadings relating P latent variables to J indicators, and ε is a J by 1 vector of the residuals of all indicators. In our model, J and P are equal to 16 (indicators) and 4 (latent variables), respectively.

The proposed structural (inner) model expresses the relationships among latent variables and can be expressed as follows:

$$Y_4 = Y_1\beta_1 + Y_2\beta_2 + Y_3\beta_3 + \zeta_4$$

where β 's are path coefficients relating a latent variable to other latent variables and ζ 's are the residuals of the latent variable left unexplained by the corresponding exogenous latent variables. In the model, Y_1 , Y_2 , and Y_3 are exogenous, whereas Y_4 is endogenous.

The above model can be expressed as:

$$Y = B'Y + \zeta \tag{2}$$

In the structural model, B is a P-by-P matrix of path coefficients relating P latent variables among themselves, and ζ is a P by 1 vector of the residuals of all latent variables.

The weighted relation for the proposed model is as follows:

$$Y_1 = X_1w_1 + X_2w_2 + X_3w_3 + X_4w_4 + X_5w_5$$

$$Y_2 = X_6w_6 + X_7w_7 + X_8w_8 + X_9w_9 + X_{10}w_{10} + X_{11}w_{11}$$

$$Y_3 = X_{12}w_{12} + X_{13}w_{13} + X_{14}w_{14} + X_{15}w_{15}$$

$$Y_4 = X_{16}w_{16}$$

In the weighted relation model, W is a J by the P matrix of weights assigned to J indicators, which, in turn, lead to P latent variables. This can be rewritten compactly as:

$$Y = W'X \tag{3}$$

In sum, generalized, structured component analysis involves three sub-models taking the general forms as follows:

Measurement model	$X = C'Y + \varepsilon$
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Structural model	$Y = B'Y + \zeta$
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Weighted model	$Y = W'X$
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where:

X is a J by 1 vector of indicators

Y is a P by 1 vector of latent variables

C is a P by J matrix of loadings

B is a P by P matrix of path coefficients

W is a J by P matrix of component weights

ε is a J by 1 vector of the residuals of indicators

ζ is a P by 1 vector of the residuals of latent variables

3.4. Assessment of the Measurement Model

PLS bootstrapping with 10,000 samples [11,12,85] was used to assess the statistical significance of the model. The results of the PLS-SEM analysis are shown in Figure 2. The model tested their reliability and validity and measured the level of consistency of their scores. The indicators are all highly correlated with their intended constructs. The construct indicators were nearly all above the cutoff score of 0.708, proving that all of them represented the construct [77,79–81,89].

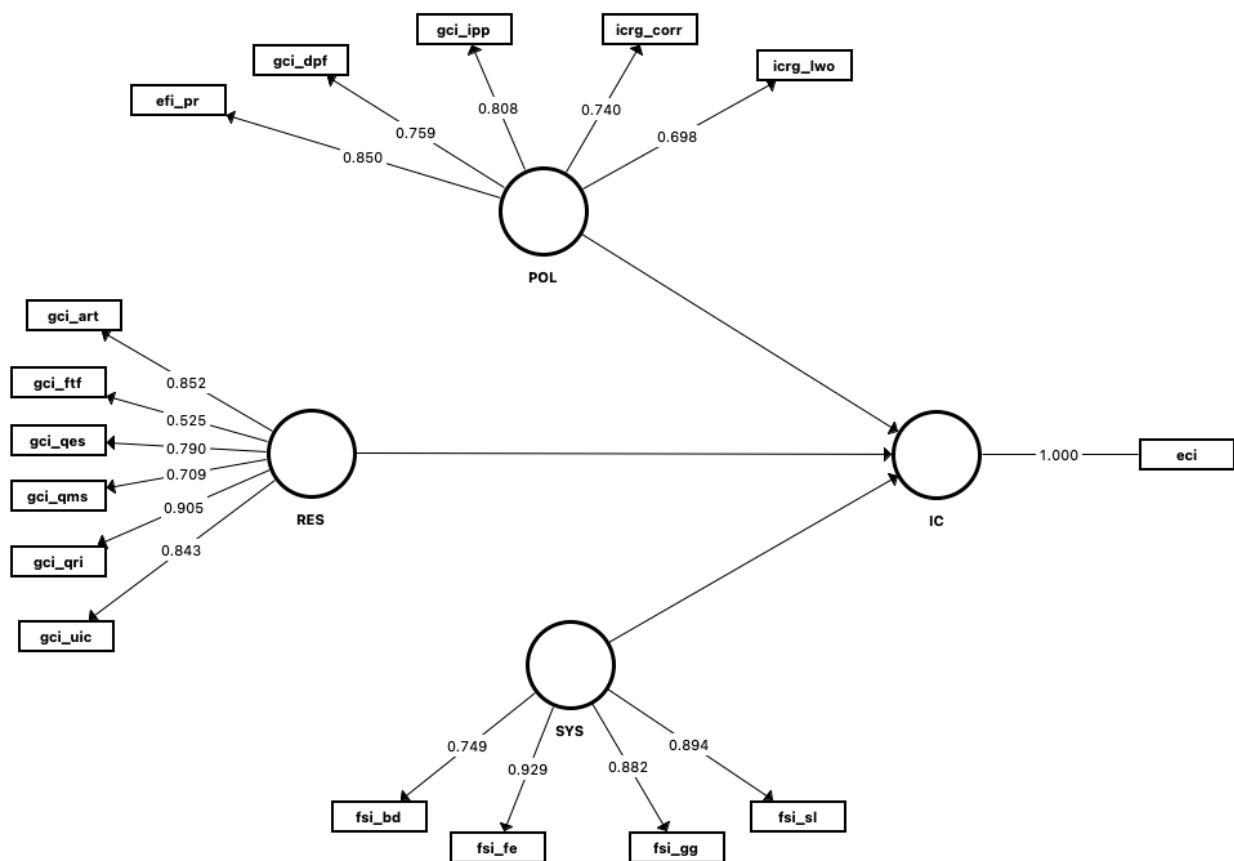


Figure 2. Indicator loadings. Source: Results from SmartPLS software 3.3.3.

To assess internal consistency, Cronbach’s alpha and Heterotrait-Monotrait Ratio (HTMT) composite reliability were used [90]. Cronbach’s Alpha coefficients ranged from 0.838 to 1.000. All scores were greater than the minimum score of 0.7. The Rho A also exceeded that value. The composite reliability was over 0.7 and passed a minimum level of adequacy. This has shown that there is consistency within the data. Results of average variance extracted (AVEs) were greater than the suggested minimum of 0.5 (see Table 4) [11,74–77,79–81].

Table 4. Construct validity and reliability.

	Cronbach’s Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
POL	0.838	0.885	0.881	0.597
RES	0.881	0.928	0.904	0.581
SYS	0.887	0.888	0.923	0.751

Source: Results from SmartPLS software 3.3.3.

We also examined the discriminatory validity of the constructs using the Heterotrait-Monotrait Ratio (HTMT). The values were below 0.85, which shows adequate discriminatory validity [90,91] (see Table 5).

Table 5. Discriminant validity-HTMT.

	IC	POL	RES
POL	0.386		
RES	0.467	0.739	
SYS	0.601	0.691	0.398

Source: Results from SmartPLS software 3.3.3.

Complementary information about the measurement model is shown in Table A1: Indicators descriptive statistics, Table A2: Mean, STDEV (Standard Deviation), T-Values, *p*-Values, confidence intervals, Table A3: Outer Loadings-Mean, STDEV, T-Values, *p*-Values, Confidence Intervals, and Table A4: Outer VIF Values.

3.5. Assessment of the Structural Model

For the structural model, inner VIF (Variance Inflation Factor) values are examined. The results are below the recommended threshold of 3.3 [92,93]. Additionally, path coefficients are statistically significant at 95%.

Regarding the predictive accuracy, coefficient of determination (R2), the exogenous constructs (POL, RES, SYS) explain 41% of the endogenous construct (IC), which is considered a moderated effect [94,95]. Q2 statistics are used to measure the PLS path model’s quality. This criterion recommends that the conceptual model predicts the endogenous latent constructs. In our model, the value for IC is 0.404. The values greater than zero for a particular endogenous latent construct are considered relevant [75]. Assessing the effect sizes (*f*2) shows that the effect size of POL (0.019) is small, RES (0.144) is moderate, and SYS (0.284), as shown in Table 5, is substantial [75,96].

4. Discussion of Findings

To evaluate the paths’ importance, the validity of the measures was assessed based on the path coefficients and the significance of the path coefficients, and the significance level. The resulting *p*-values were obtained using SmartPLS by using a bootstrapping process and calculating the *p*-value of different paths. Path coefficients and significance levels have been determined by randomly sampling 10,000 instances into the model. The results are shown in Table 6 and are supported by Figure 3.

Table 6. Hypothesis results.

Hypothesis	Coefficient	Standard Deviation	T Statistics	<i>p</i> Values	VIF	<i>f</i> Square	CI	
							2.5% Lower	97.5% Upper
H1 POL- > IC	−0.158	0.052	3.061	0.002	2.260	0.019	−0.257	−0.054
H2 RES- > IC	0.369	0.044	8.316	0.000	1.611	0.144	0.275	0.459
H3 SYS- > IC	−0.526	0.040	13.052	0.000	1.655	0.284	−0.600	−0.448

Source: Results from SmartPLS software 3.3.3.

Figure 3 shows the results of the outer model in factor loadings and *p*-values, and the inner model in path coefficients and *p*-values. The size of the arrows represents the absolute value of each path. As mentioned before, indicators are significant for each construct. In Table 5, we summarize the results for each proposed hypothesis.

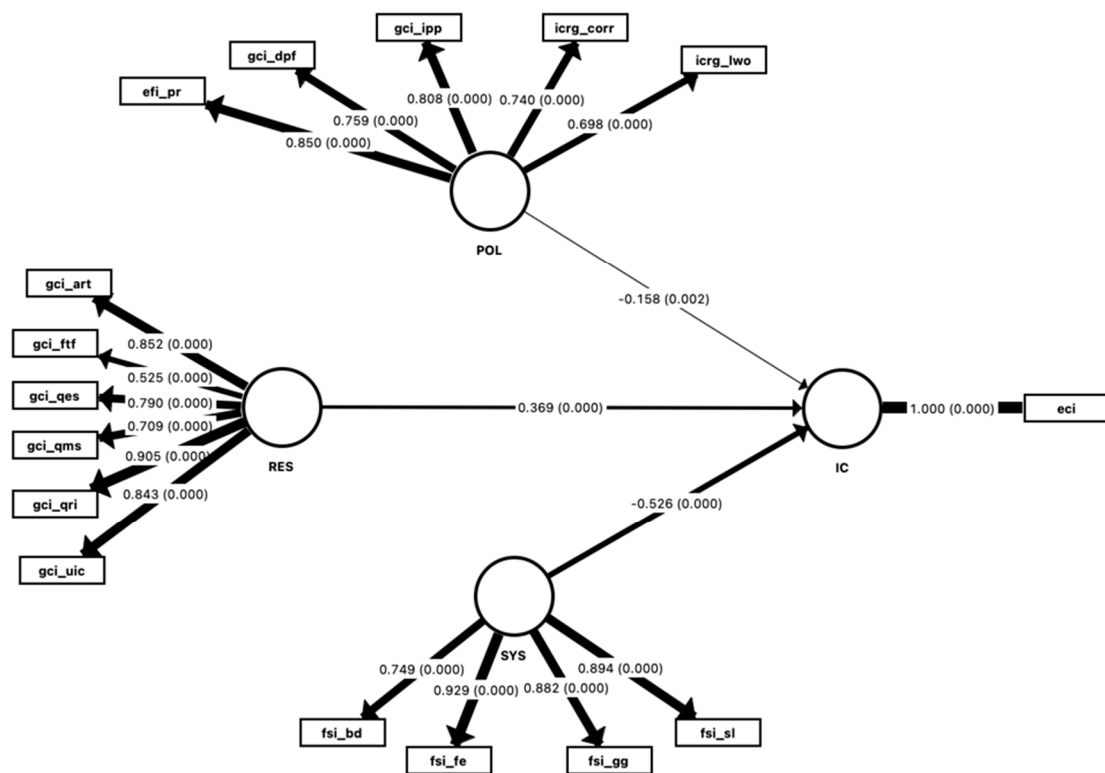


Figure 3. Model results. Source: Results from SmartPLS software 3.3.3.

Our findings are in line with the evidence from the literature that suggests that political conditions (POL) may harm the way countries compete in the international arena [19,97–103]. In the case of the analyzed emerging economies, property rights, diversion of public funds, intellectual property protection, corruption, and law and order negatively affect international competitiveness. All the indicators measured are relevant, but the higher loads are in those related to property rights and corruption. Our analysis also shows that an adequate scientific and technological framework (RES) enhances the emerging economies’ international competitiveness [104–107]. The endowment of research and training services, FDI, and technology transfer, quality of the education system, quality of STEM education, quality of research and scientific institutions, and university-industry collaboration are essential factors to compete internationally. In this case, the more relevant indicators are the quality of research and scientific institutions, availability of research and training services, and university-industry collaboration.

Systemic conditions deter international competitiveness. Structural extractive frameworks impede the development of conditions required for an adequate global competition insertion [108–111]. Emerging economies are constrained by brain drain, groups of grievance, factionalized elites, and state legitimacy, as shown in this study’s results. The loadings in this construct show the relevance of factionalized elites and state legitimacy in the structural systemic conditions to compete.

5. Conclusions

Research in this field is challenging because the frequent changes in the research context and the significant shifts in formal and informal institutional environments in emerging economies require alternative analysis methods. PLS-SEM exploratory modeling can handle complex models and relaxes the demands on data and relationships’ specification, making it very useful for this study.

The proposed model using SEM-PLS to estimate and evaluate the correlation between selected indicators and the proposed constructs to measure institutional quality shows

that the independent latent variables explain a significant proportion of the dependent construct's variability.

The analysis shows that political conditions could harm emerging economies' ability to compete with complex products in the international market. As shown in Table A1, the median value of the proposed indicators is slightly inclined to low performance, which allows us to infer that a lower quality of political conditions harms the ability to compete internationally with complex products. The indicator that has the most negative effect is property rights, which is coherent. If the firms' knowledge is not protected, innovation and productive transformation are not encouraged. In the same path, the indicator with a less adverse effect is the diversion of public funds because it affects the competitive environment.

It is also evident that the STEM resources have slightly good performance, which confirms that an adequate infrastructure for science, technology, engineering, and mathematics fosters the countries' ability to develop more complex products. In this construct, the quality of the education system somewhat contributes to the economic complexity. The quality of research institutions is the most critical indicator of the economic complexity to compete internationally.

Finally, extractive systemic conditions, which means the state's capture by elites and delegitimization of the state, are critical impediments to compete for global markets. In this construct, state legitimacy has the worst impact. If the market cannot believe in the state, it will not be possible to transform the productive structure. Although the group of grievance indicator has a lesser negative effect, it is also a condition that harms the effective transformation required for more economic complexity.

The model results, analyzed employing the PLS-SEM method, confirm the literature findings regarding the institutional framework's role, measured by political, resources, and systemic conditions. This paper demonstrates the importance of institutions in fostering the competitive economic strength of emerging economies.

A way of action could be the strengthening of regulations to increase the property rights protection and control of the investment of public funds. This could lead to a better perception of the state's legitimacy, which would promote the research and development through the participation of different stakeholders, including academia, civil society, and research institutions.

6. Contributions and Limitations of This Study

This study contributes in various ways to the existing literature. First, it sheds light on the importance of analyzing the political conditions in emerging economies to compete in the global markets. Second, it highlights the negative effect of extractive systemic conditions on international competitiveness. Third, it confirms the importance of STEM resources to generate complex products to compete internationally. Finally, it shows the deployment of an alternative method to evaluate the intricate relationships between institutional quality and international competitiveness. PLS-SEM allowed us to explore emerging economies' conditions even under the limitations described below.

A limitation of the current study is the small number of observations (528) divided into five distinct regions. Another limitation of the research is that it only focused on a few selected indicators according to the literature reviewed. This research's limitations could be overlooked in the future by adding more constructs, variables, and observations. The paper can be enriched by adding intra-regional and inter-regional approaches to control by the occurrence of particular circumstances (i.e., informal institutions or economic development).

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Appendix A

Table A1. Indicators descriptive statistics.

	Mean	Median	Min	Max	Standard Deviation	Excess Kurtosis	Skewness	Number of Observations
eci	0.113	0.124	-2.764	1.695	0.750	0.312	-0.298	528
efi_pr	44.068	40.000	5.000	90.000	17.468	0.135	0.388	528
fsi_bd	5.378	5.200	2.100	8.500	1.541	-0.942	0.126	528
fsi_fe	6.108	6.500	1.100	10.000	2.169	-0.846	-0.286	528
fsi_gg	6.361	6.300	3.000	10.000	1.785	-0.959	0.111	528
fsi_sl	6.302	6.500	1.600	9.500	1.742	-0.737	-0.399	528
gci_art	4.151	4.149	2.340	6.084	0.583	0.705	-0.150	528
gci_dpf	3.299	3.157	1.219	6.603	0.938	1.239	1.000	528
gci_ftf	4.698	4.754	2.477	6.092	0.587	0.203	-0.393	528
gci_ipp	3.631	3.600	1.629	6.160	0.833	0.256	0.503	528
gci_qes	3.609	3.554	2.092	5.881	0.725	0.267	0.509	528
gci_qms	3.986	4.125	1.876	6.082	0.891	-0.798	-0.252	528
gci_qri	3.901	3.877	2.178	5.934	0.647	-0.007	0.310	528
gci_uic	3.560	3.479	2.072	5.472	0.614	0.261	0.462	528
icrg_corr	2.437	2.500	0.500	4.500	0.668	1.052	0.469	528
icrg_lwo	3.535	4.000	1.000	5.000	1.039	-0.857	-0.382	528

Source: Results from SmartPLS software 3.3.3.

Table A2. Mean, STDEV, T-Values, *p*-Values, confidence intervals.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	<i>p</i> Values	CI 2.5% Lower	CI 97.5% Upper
POL- > IC	-0.158	-0.154	0.052	3.035	0.002	-0.257	-0.054
RES- > IC	0.369	0.368	0.047	7.858	0.000	0.275	0.459
SYS- > IC	-0.526	-0.524	0.039	13.622	0.000	-0.600	-0.448

Source: Results from SmartPLS software 3.3.3.

Table A3. Outer Loadings: Mean, STDEV, T-Values, *p*-Values, confidence intervals.

	Original Sample (O)	Sample Mean (M)	Standard Deviation	T Statistics	<i>p</i> Values	CI 2.5% Lower	CI 97.5% Upper
eci < -IC	1	1	0			1	1
efi_pr < -POL	0.85	0.85	0.014	60.122	0	0.821	0.877
fsi_bd < -SYS	0.749	0.749	0.019	38.825	0	0.71	0.784
fsi_fe < -SYS	0.929	0.929	0.008	121.245	0	0.912	0.942
fsi_gg < -SYS	0.882	0.882	0.011	76.927	0	0.857	0.902

Table A3. Cont.

	Original Sample (O)	Sample Mean (M)	Standard Deviation	T Statistics	p Values	CI 2.5%	CI 97.5%
						Lower	Upper
fsi_sl < -SYS	0.894	0.894	0.008	105.738	0	0.876	0.909
gci_art < -RES	0.852	0.851	0.013	63.767	0	0.823	0.875
gci_dpf < -POL	0.759	0.755	0.036	21.29	0	0.677	0.816
gci_ftf < -RES	0.525	0.524	0.042	12.523	0	0.435	0.6
gci_ipp < -POL	0.808	0.806	0.026	30.721	0	0.747	0.849
gci_qes < -RES	0.79	0.787	0.025	32.217	0	0.735	0.831
gci_qms < -RES	0.709	0.708	0.028	24.924	0	0.649	0.761
gci_qri < -RES	0.905	0.905	0.008	119.89	0	0.889	0.918
gci_uic < -RES	0.843	0.843	0.015	56.113	0	0.811	0.87
icrg_corr < -POL	0.74	0.738	0.032	23.271	0	0.67	0.794
icrg_lwo < -POL	0.698	0.697	0.029	23.855	0	0.636	0.75

Source: Results from SmartPLS software 3.3.3.

Table A4. Outer VIF values.

	VIF
eci	1.000
efi_pr	1.995
fsi_bd	1.464
fsi_fe	7.036
fsi_gg	4.096
fsi_sl	3.700
gci_art	2.674
gci_dpf	2.690
gci_ftf	1.317
gci_ipp	2.857
gci_qes	3.226
gci_qms	2.751
gci_qri	3.460
gci_uic	3.419
icrg_corr	1.715
icrg_lwo	1.475

Source: Results from SmartPLS software 3.3.3.

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