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The impact of globalisation on industrial development in South Africa: the mediating role of institutional quality

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Abstract

Background Globalisation has brought significant benefits to countries' industrialisation, but its impact has not been uniform. Policymakers in developing countries have increasingly focused on sound institutions' role in offsetting the potential negative effects of an integrated economic structure. However, evidence of the mediating role of institutional quality in South Africa's unique economic globalisation and industrial development relationship has been limited.

Objective This study had the primary objective to assess the mediating role of institutional quality within the globalisation and industrialisation nexus in South Africa.

Method The analysis used a quantitative research approach through a time series analysis, based on secondary data from 1980 to 2021. The long-run relationships between the variables were assessed through novel cointegration tests, while three different cointegration regression estimation techniques were employed to estimate the elasticities. Moreover, Toda-Yamamoto causality tests were utilised to evaluate the causal linkages between the variables.

Results The findings suggest that South Africa's unique integration path has benefited industrial output significantly since its move to a more liberal and democratic structure. However, the level of institutional quality has contributed to a diminishing effect in this regard. This emanates primarily from a misalignment between institutional frameworks and the demands of globalisation, including increased competition and regulatory challenges.

Conclusion Based on this, the study recommends that policymakers prioritise developing a comprehensive industrial policy to promote key strategic sectors, regional integration, and public-private partnerships. Moreover, they should improve the business environment and infrastructure by means of reducing the costs of doing business, enhance the rule of law, ensure a stable financial system to attract foreign investment and foster sound regional partnerships.

Keywords Economic globalisation, Interactive effects, Development, Industrialisation, South Africa

JEL Classification F63, F62, L16, L60

Introduction

Globalisation, characterised by the increasing interconnectedness of economies, markets, and societies, has emerged as a defining feature of today's world [28, 29, 67]. Over the past few decades, this phenomenon has spurred rapid economic growth and technological progress, transforming the industrial landscapes of nations

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across the globe [39, 71, 75]. However, the impact of globalisation has been far from uniform, with different countries, especially in Africa, experiencing varying degrees of success and challenges in harnessing its potential [31, 117, 118], (Beri et al. 2022). Globalisation often imposes industrialisation models that lack inclusiveness, equity, broad participation, and social transformation, thereby negatively affecting the development trajectory of a country [76].

One nation grappling with the multifaceted implications of economic globalisation is South Africa. As a prominent African member and a regional economic powerhouse, South Africa's journey through globalisation has been marked by unique complexities, opportunities, and obstacles [72]. It has transitioned from a period of isolation during apartheid to a more open and democratic economic structure [40, 70]. This transition has created an environment where economic globalisation plays a pivotal role in shaping the country's industrial development [121]. While globalisation has significantly influenced the growth of its services sector (Jules et al. 2021), the manufacturing sector's share, both in output and employment, has stagnated or declined, indicating premature deindustrialisation and deficient productivity performance [6].

In this context, policymakers in South Africa have increasingly recognised the importance of sound institutional quality in mediating the effects of economic globalisation on industrial growth ([24, 118]). Institutions, including legal frameworks, regulatory bodies, governance structures, and public–private partnerships, are essential determinants of a country's ability to harness the benefits of globalisation while mitigating its potential downsides [69]. Sound institutions are vital for attracting foreign investors, fostering domestic innovation, and ensuring that economic growth is equitable and sustainable [32, 84, 92, 108]. Moreover, sound institutions can help avoid domestic crises, diversify the economy, and improve the manufacturing sector's performance, but there is no consensus on whether they can completely mitigate the effects of economic globalisation [16], [58, 109]. Some studies suggest that the quality of a country's institutions appears to be more critical than economic globalisation in influencing advanced manufacturing [77].

Considering these ambiguities, the South African context relating to industrial development has provided limited empirical evidence regarding the interplay between economic globalisation and institutional quality. Despite the increasing acknowledgement of the significance of institutions in the globalisation–industrialisation nexus, there is a surprising scarcity of empirical evidence on how economic globalisation and institutional quality

interact within the country's industrial development. To our knowledge, prior studies have yet to explore this interaction. While existing research has examined the broader effects of globalisation on South Africa's economy [28, 57], a comprehensive analysis of how institutional quality mediates this relationship is conspicuously absent. This knowledge gap is critical as it hampers the formulation of effective policies to optimise the country's global economic participation. This study investigates the relationship between economic globalisation and institutional quality, with a focus on how these dynamics influence industrial development in South Africa. South Africa offers an intriguing opportunity to study the dynamics of globalisation, industrial development, and institutional quality. As the continent's most industrially advanced economy and a significant participant in global markets [62], South Africa holds a distinct place at the intersection of developed and developing nations. South Africa's intricate past, marked by profound socio-economic inequalities and institutional changes, offers a unique context for examining the interplay between globalisation and industrial development [7, 20]. Additionally, South Africa's deep involvement in global value chains, its economy fuelled by resources, and its position as a regional economic centre [57] highlights its significance in examining the nuanced effects of institutional quality on economic pathways. Collectively, these elements position South Africa as a prime example to investigate these complex relationships. The implications of this research are of utmost importance to policymakers and stakeholders in South Africa and other developing economies facing similar challenges.

Literature review

Theoretical background: understanding globalisation

Globalisation has largely been considered a multifaceted concept, encompassing economic, sociocultural, political, and technological dimensions [48]. This multidimensionality implies that examining globalisation from one perspective may theoretically lead to implications in other dimensions, highlighting the high degree of interconnectedness among these aspects. In its comprehensive sense, economic globalisation represents the interrelation and correlation of economies and markets [85, 97]. Beyond its multifaceted nature, globalisation is recognised not just as a complex concept, but also as a process aimed at reducing trade barriers, facilitating the international flow of capital and migration, and ultimately striving for a unified global economy. However, the integration of global economies, particularly in the African context, has posed significant challenges. These challenges encompass financial crises, a rise in poverty levels, and issues related to trade infrastructure [118].

The complexity of globalisation is underscored by the various definitions it has received. For instance, Robertson and White [122] suggest that globalisation can be characterised as both the compression of the world and the intensification of global awareness. Conversely, Dreher et al. [33] argue that it signifies a scenario in which a single interest rate considers exchange rates and default risks. In essence, globalisation is often described using terms that themselves require some level of clarification.

On the other hand, industrialisation historically has been a process primarily experienced by developed countries, and it remains a key goal for leaders in many less-developed economies. When a nation undergoes industrialisation, its economy undergoes significant transformations [1]. The methods of producing physical goods become increasingly mechanised, with human labour being gradually replaced by other sources of energy, primarily minerals, which are then directly applied to the production of essential goods. Industrialisation is a unique phenomenon in the realm of human commerce and economic transformation. It signifies a period when economic activity experiences a substantial increase, resulting in a profound and irreversible transformation of a nation's economy. Following this transformation, the production and international trade of commodities continue permanently at a significantly higher level of intensity [3]. This transformation is largely attributed to technological advancements in power supply, enabling a factorial increase in productive capacities. Simultaneously, it triggers a wide range of accompanying changes in social relations related to work, trade, communication, consumption, and human settlement patterns. Furthermore, it inevitably leads to profound cultural, ideological, and political shifts [106].

Considering the overarching prominence of these processes, their interlinkages have been vastly prominent and captured in a number of key theoretical underpinnings [25, 90]. Central to this, has been the idea that increased economic relations between countries are set to accelerate the industrialisation trajectories of nation states [38]. This has been captured by the Stolper-Samuelson theorem, advocating for the international division of labour and the benefit that countries receive on the basis of their comparative advantages [49].

As trade policies open markets for comparative advantage, global production networks introduce and intensify competition in the domestic country for sectors that boost industrial growth and export earnings [65]. In this respect, the injection of foreign capital, financial flows, and their associated knowledge spillovers, has expanded manufacturing sectors allowing for enhanced economic output and employment capacity (Erixon 2018). “Besides the direct positive

impact on inclusive growth, globalisation has indirect positive and significant impact on inclusive growth through institutional quality” [61]. However, Shirley [102] recognises that countries with a colonial heritage tend to inherit poor institutions that exploited their endowments, established structures, and norms that did not appeal to the wider population as is the case in South Africa with the legacy of apartheid. Notwithstanding, industry institutions and trade associations are now prompted to prioritise collective interest and well-being of an industry's constituent firms and play a prominent role in industrial development [107]. The institutional reforms are characterised by improved infrastructure, easing regulatory barriers, and fostering innovation that is necessary to support industrialisation and ensure that globalisation drives sustainable economic growth. However, “strong institutions are more important than the speed of reforms” [87]. The Stolper-Samuelson, thus, provides valuable insights for the case of South Africa in terms of how globalisation interacts with institutional quality and industrial development. Although the integration into global markets provides opportunities for growth, the outcomes are significantly dependent on South African policies that foster equitable development and industrial development that are accompanied by the quality of a country's institutions and governance.

However, globalisation has been argued to expose developing countries to increasing income inequality. This is attributed to advancements in technology, changes in trade dynamics, and migration patterns associated with deeper economic integration with other economies [15]. In developing countries, the risk of heightened inequality linked to active participation in the global economy is particularly significant due to institutional weaknesses often tied to poverty [111]. Additionally, Edwards [34] argues that trade alters product prices, which can influence returns to specific worker attributes. According to theory, when factors of production are immobile, trade liberalisation increases returns to specific factors in export industries, potentially exacerbating inequality. However, in practice, labour markets are often imperfect, and trade can also affect industry-specific factor rents, such as union wage premiums. Contrary to the Stolper-Samuelson theorem, which advocates for the benefits of comparative advantage and international division of labour, dependency theory offers a contrasting perspective. This strand of research posits that core-periphery relations induced by a global capitalist system have reduced the capacity of especially those in the global south in adequately transitioning from agrarian-based economies towards more services-based systems [56]. This line of thought suggests that the liberalisation of trade, capital account openness, and the mobility of

labour (and their associated skill sets) have exposed the developing world to significant harmful economic shocks [30]. Consequently, this has seen many countries enter into what has come to be characterised as a premature deindustrialisation phase.

The relationship between globalisation, institutional quality, and industrial development

In light of these intricacies, the role that institutional quality within this nexus is one that has been somewhat ambiguous. Institutions in this sense can be categorised as either implicit or explicit rules that govern how members of local and global societies interact with each other. These rules play a crucial role in shaping the behaviour of individuals and organisations within an economy, helping to explain the economic performance of different countries [19]. When these rules are not followed, when governments have unchecked discretion and property rights that are not secure, or corruption is rampant the quality of institutions tends to suffer [53]. This, in turn, leads to undesirable outcomes such as inefficient resource allocation and compromised decision-making [26]. Relating to the moderating role of these structures in augmenting the relationship between an economic integration and the industrialisation of countries, their role has been twofold. Firstly, when these structures foster trust and cooperation, promote investments, and effectively regulate the free movement of resources, numerous institutions contribute to financial growth and sustainability [21]. This comes on the ability to attract foreign investors while likewise fostering domestic innovation, productivity, reduced uncertainty, and ensuring a fair distribution of resources, all which can enhance the competitiveness of industrial sectors [99]. Conversely, economic decline, political unrest, and corruption often stem from weak institutions all which encourage socially unproductive behaviours, such as rent seeking [81]. The adverse impact within the interlinkage between a globalised economic system and industrial activity in this respect comes on the inability to adequately address market failures that may arise externally [13]. So too, can it induce inefficient bureaucratic processes that can deter foreign economic and financial flows, all which can culminate in an inability of countries to reap the benefits that international economic processes have to offer [13].

Empirical review

In relation to these theoretical considerations, South Africa's process of industrialisation points to the developmental features that typically underlie the development of economies [36]. This includes the initial establishment of factories, the use of comparative advantage, adoption

of new technologies, and to an extent the diversification of industries. In this context, industrial development in South Africa has undergone many industrial changes over the years, from the colonial era (seventeenth–twentieth century) led by mining to the apartheid era (1948–1994) led by manufacturing, and to the post-apartheid era (1994–present). Accordingly, the manufacturing sector has been reorganised owing to the international division of labour through global economic integration, diversified production, skills development, and increased levels of investment and saving [90]. All these developments have incurred under a blanket of various unique attributes relating to the economic sanctions imposed during an era of isolation, the inheritance of a concentration of wealth, and significant dependence on its natural resources [119].

Though with transition to a more democratic dispensation and a unique (in relation to other African countries) internal adoption of a more neoliberal industrial policy, industrial activity did seem to eradicate some of the challenges [42]. More specifically, it saw the reduction of poverty, unemployment, and a spur in economic growth rates, at least for the first ten years after these changes occurred [45]. Unfortunately, these structural changes seemed to have faded since then. With the country continuously integrating into key international economic flows, its institutional landscape deteriorated, with notable signs of corruption, maladministration, and crippling levels of bureaucracy, the performance of its manufacturing sector has deteriorated. For example, manufacturing output as percentage of GDP declined from over 15.6 per cent to under 12 per cent over this period [115]. Additional concerns have related to the sector's employment contribution seeing it decline from approximately 15 per cent to lower than eight per cent during the same period [105]. While this would associate itself with the successful transition to a more services-based economy, it occurred at notably lower GDP per capita levels (\$5 432) than other developing nations that have been touted as notable success stories [18, 89]. All of which have signalled a premature deindustrialisation of the country's development.

Given these intricate insights, empirical evidence to provide further comprehension regarding the impact that institutional quality has had in this respect has been somewhat contentious and scant. Some studies from this perspective have investigated the impact of institutional quality on globalisation and economic growth. Mullings [77] investigated the effects of economic globalisation on economic growth in panel of 85 countries between 1986 and 2010. In the study, institutional quality components representing the rule of law, civil liberties, and political

rights were included. The study found that on its own, institutional quality contributed positively to economic growth, whereas economic development, on its own, was not significant. However, after an interaction term between these two, it was found that both institutional quality and economic development increased economic growth. Chong and Calderon [26] focused on the impact of corruption, bureaucratic quality, property rights, and economic growth. The study found that low growth in poor countries was mostly driven by institutional quality compared to rich countries; however, the study did not account for economic globalisation.

Salman et al. [95] investigated the interactions between trade openness, carbon dioxide emissions, and institutional quality and their effects on economic growth in the East Asian economies between 1990 and 2016. The study found a positive and significant positive interaction term between carbon dioxide emissions and institutional quality which pointed to the fact that efficient and impartial domestic institutions are very important to increase economic growth and decrease carbon emissions, simultaneously. Secondly, institutional quality, energy use, and trade openness were found to stimulate economic growth. Moreover, the link between economic growth and institutional quality was characterised by a unidirectional causality run from institutional quality to economic growth. In a more recent study, Boateng et al. investigated whether foreign-aid volatility affects economic growth in countries with an effective institution. Using data from 45 sub-Saharan African countries over the period 1980–2017, the study found that foreign-aid commitment enhanced economic growth, whereas foreign-aid volatility impaired economic growth. Furthermore, the study found that although institutional quality and its sub-dimensions enhance economic growth, it failed to curtail the adverse effect of aid volatility on economic growth. Peres et al. [84] examined the moderating role of institutional quality on the resource curse effects in Africa. The study found that the autocorrelation of the economic growth of neighbouring economies was driven by institutional quality. Moreover, results inferred that the impact of institutional quality was initially negative and turned positive, indicating resource allocation before and after globalisation.

Additionally, Ezcurra [37] investigated the interconnectedness of globalisation and governance. In the study, the globalisation index is segregated into components that distinguish social and political elements from economic elements. The results showed that when a country integrates more with the world economy, there is a tendency for it to experience better governance. The dimensions of globalisation that contributed more to

better governance are economic and social. In similar vein, Khan [59] examined the relationship between economic globalisation and institutional quality proxied by governance for the world economy. The results indicated that economic and political globalisations are significant predictors of institutional quality. In particular, increased economic globalisation led to better governance.

Berg et al. [13] analysed data from approximately 100 countries to examine the relationship between economic and social globalisation and institutional quality. The study found that while globalisation positively correlates with institutional quality in wealthy countries, the relationship is negative in poorer nations, particularly those with an abundance of natural resources. This finding underscores the challenges of the resource curse, where globalisation fails to address structural inefficiencies in resource-dependent economies. The authors caution against interpreting this correlation as causal, emphasising that globalisation alone cannot resolve institutional weaknesses in developing countries. Similarly, Prasad et al. [88] argue that financial globalisation has not consistently promoted growth and has, in some cases, increased consumption volatility, particularly in economies with inadequate institutional frameworks.

Samadi [96] found that globalisation's outcomes are less favourable for developing countries compared to global trends, particularly in contexts where institutional quality measured through regulatory quality and government effectiveness is weak. The study aligns with structuralist arguments that globalisation exacerbates inequality and poverty through uneven resource distribution. Shahnaz et al. [101] expanded on this by investigating globalisation's role in intra- and inter-state conflict across 83 developing countries, finding that globalisation can intensify tensions in states with fragile institutions. However, improved institutional quality was shown to mitigate these adverse effects, further highlighting the importance of robust governance in managing globalisation's complex impacts.

Methods

Design, sample description, and data sources

In light of these intricacies a lack of a clear understanding and considering the specific nuances of the South African context, the main aim of the study was to examine the interactive effects of institutional quality within the economic globalisation and industrialisation nexus in the South African economy. By doing so, the study adopted a quantitative research design, while a functional research paradigm provided the philosophical base in which it was grounded. In investigating the specific relationships, the

study utilised secondary time series data from several local governmental and international institutions. The inquiry spans from 1980 to 2021, providing the analysis with 42 observations. The timeframe was selected primarily on the availability of the data. So too, was the selection thereof informed on the basis of affording the study notable insight, specifically into two of the latest waves of the globalisation process, both characterised by arguably the most significant influxes of trade and financial flows over the course of history [126].

The analysis made use of a total of six variables. Here manufacturing output (as a % of GDP) was utilised as the dependent variable, which served as a proxy for levels of industrialisation. The selection here was motivated by the premise of this indicator's use in the extant literature [47, 78]. In relation to this, the two main regressors, which sought to capture the dynamics of South Africa's economic integration and levels of institutional quality, were included through two specific indices. The first is an economic globalisation sub-index of the KOF Swiss Economic Institute's [60] globalisation index. It is based on trade-related aspects (trade in goods, services, trade regulations) and finance-related flows (foreign direct investment, portfolio investment, capital account openness). To account for levels of institutional quality, the study used a self-constructed institutional quality (IQ) index using five constituent variables sourced from the Political Risk Services Group [54] database. These included variables relating to levels of corruption (range: 0–6), law and order (range: 0–6), government stability (range: 0–12), democratic accountability (range: 0–6), and bureaucracy quality (range: 0–4). Each variable was normalised through a max–min method, attributing a score of between 0 and 100. This was done to ensure

uniformity and that each can be compared to the other. The index as constructed was equally weighted through means of a geometric aggregation. This aggregation technique was specifically chosen as it avoids the full compensability condition and assesses the marginal contribution of each underlining variable separately. In this manner, the weighting of each variable reflects a more reliable measure of importance [5, 46]. The use of this specific index is motivated on the basis of its common use in social science research [43, 50, 64]. More importantly it is regarded as the most commonly accepted measure for IQ in the body of literature [114]. Table 1 shows each of the included variables and a description of each and the database from which they were sourced.

Geometric aggregation is chosen on the basis of its strengths in relation to its assumption of inferior compensability for components with low scores and likewise overcomes preference independence assumption of linear aggregation methods.

In addition to the aforementioned variables, as shown in Table 1, three additional control variables were included. This comprised measures that account for levels of human capital, the real effective exchange rate as well as the degree of domestic investment within the aggregate economy. These were included on the basis of capturing key stimuli within this nexus as well as taking into consideration their prevalence within the extant literature ([23, 74, 113]). Specifically, here components of the human capital index were selected to proxy for the intellectual capital that serves as driver for the productive ability and innovative capacity in the industrialisation process [27]. The real effective exchange rate was included to control for the international competitiveness within the global context

Table 1 Variable description. *Source:* Authors' own construction

Variable	Description	Database
Manufacturing value added (MVA)	Manufacturing output (as % of GDP). Levels between 0 and 100. Higher levels are indicative of the	World Bank [115]
Economic globalisation (ECG)	Economic globalisation index. Constructed from both trade and financial sub-indices. Accounting for both de facto and de jure measures. Scores range from 0 to 100	KOF Swiss Economic Institute [60]
Institutional quality (IQ)	Composite index derived from five constituent variables (corruption, law and order, political stability, democracy, bureaucracy). Ranging from 0 to 100 with higher levels indicative of better institutional structures. Geometrically aggregated	ICRG [54]
Human capital (HC)	Skill-level measure proxied through the use of the UN education sub-index from the HDI database. Composite measure derived from both mean years of schooling and expected years of schooling. Ranges from 0 to 100 with scores closer to the upper threshold representative of higher levels of human capital	UN [110]
Real effective exchange rate (REER)	Real effective exchange rate. Index of the local currency's value against a basket of currencies	SARB [98]
Gross fixed capital formation (GFCF)	Domestic investment levels. Measured through gross fixed capital formation as a percentage of GDP	SARB [98]

in which the country seeks to develop [63, 89], while GFCF was included to serve as important measure of the physical capital determinant so richly captured in pertinent growth frameworks [68, 91, 104].

Preliminary analyses

The analysis was initialised through the use of a range of preliminary techniques, conducted in several steps. The first included a descriptive overview of the variables, which sought to provide insight into the mean, max, and min scores over the 42-year period for each of factors considered. Thereafter, correlation analysis was undertaken. This was done to ascertain the nature of the association between the variables, while likewise serving as an identifier for possible multicollinearity within the dataset. Finally, after this, the preliminary analysis ensued by determining the stationarity properties of the variables. This was done through the use of a Zivot and Andrews' [120] unit root test. The selection of this specific technique, over conventional techniques such as the augmented Dickey-Fuller (ADF) or Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests, was motivated by its superior ability to account for possible structural breaks in the data. Considering the specific timespan of the study, and the notable changes in the political and economic structures of South Africa especially during the early 1990s, the use of this specific test does afford the opportunity to provide more robust results in this respect and subsequently allowing for more accurate selection of the estimation technique. Keeping this in mind, the test is expressed by Eqs. 1–3 which shows three different iterations for possible breaks in the trend, intercept, and trend and intercept:

$$\Delta y_t = \rho + \rho y_{t-1} + \sigma t + \theta DU_t + \sum_{j=1}^k d_t \Delta y_{t-j} + \mu_t \quad (1)$$

$$\Delta y_t = \rho + \rho y_{t-1} + \sigma t + \pi DT_t + \sum_{j=1}^k d_t \Delta y_{t-j} + \mu_t \quad (2)$$

$$\Delta y_t = \beta + \beta y_{t-1} + \beta t + \tau DU_t + \tau DT_t + \sum_{j=1}^k d_t \Delta y_{t-j} + \mu_t \quad (3)$$

Based on this, TB is indicative of the possible breakpoint and k shows the upper limit of the lag length of the regressors. So too does DU_t and DT_t , denote the included dummy variable which shows that a shift arises at a point, while DT_t represents a trend in shift.

Accordingly, here $DU_t = 1$ with DT_t equivalent to $t - TB$ if $t > TB$. If otherwise, it will be equal to zero.

Estimation techniques and model specification

Subsequent to the identification of the stationarity properties of the dataset, the analysis ensued by determining whether there did exist any long-run relationships. In doing so, a Bayer and Hanck combined test for cointegration was utilised. The test bases its identification of these properties by making use of a Fisher-type formula and in the process estimating firstly a test statistic by combining both Engle and Granger [35] and Johansen [55] tests. Additionally, a second test statistic is calculated by combining the two aforementioned cointegration techniques together with those formulated by Boswijk [17] and Banerjee et al. [11]. By adopting this approach, the use of the combination of techniques offers a more robust approach in comparison with the use of individual techniques. Both tests assume the null hypothesis of no cointegration. Hence in calculating both the test statistics, the following equations, 4 and 5, are utilised as expressed below:

$$EG - JOH = -2[\ln(P_{EG}) + \ln(P_{JOH})] \quad (4)$$

$$EG - JOH - BO - BDM = -2[\ln(P_{EG}) + \ln(P_{JOH}) + \ln(P_{BO}) + \ln(P_{BDM})] \quad (5)$$

From Eqs. 4 and 5, P_{EG} and P_{JOH} show the test probabilities of the Engle and Granger [35] test and the Johansen [55] test, respectively. Furthermore, P_{BO} is representative of the Boswijk [17] test probability, while P_{BDM} shows the test probability for the Banerjee et al. [11] test.

Finally, after making use of these tests, the analysis proceeded towards the identification of the elasticity relationships between the dependent variable and the respective regressors. Hence, towards examining the interactive effects of institutional quality, within the economic globalisation and industrial development nexus in South Africa, the following broad model was specified:

$$MVA_t = \beta_0 + \beta_1 ECG_t + \beta_2 IQ + \beta_3 (ECG * IQ)_t + \beta_4 X_{it} + \varepsilon_T \quad (6)$$

From Eq. 6, MVA refers to the manufacturing valued added output (as % of GDP), serving as a proxy for levels of industrial development. ECG represents levels of economic globalisation, IQ denotes the levels of institutional quality, while X_{it} is indicative of the set of three control variables that were included. Furthermore ε and t are representative of the error term and the time index, respectively.

The interaction term, $ECG*IQ$, is included to capture and isolate the moderating role of institutional quality. Equation 7 below illustrates this method; through estimating the marginal impact of ECG on MVA, the partial derivation of Eq. 6 with respect to the degree of economic integration is done as follows:

$$\frac{\partial MVA_t}{\partial ECG_t} = \beta_1 + \beta_3 IQ_t \quad (7)$$

Based on this equation, the findings relating to the interactive effects of institutional quality within the economic globalisation and industrialisation nexus can be interpreted on the basis of four possible outcomes:

- Where $\beta_1 > 0$; $\beta_3 > 0$, it infers that South Africa's economic integration into global networks has affected levels of industrialisation positively. Moreover, this finding suggests that prevalent IQ has further enforced these positive impulses.
- Where $\beta_1 > 0$; $\beta_3 < 0$, the results suggest that South Africa's economic integration into global networks has affected levels of industrialisation positively. However, the interaction with the prevalent levels of IQ in the country seems to offset this particular effect.
- If $\beta_1 < 0$; $\beta_3 > 0$ the results show that the manner in which the country has globalised economically has inhibited levels of industrialisation, though prevalent IQ within the country seems to allay these negative effects.
- Finally, in the case where both coefficients are negative ($\beta_1 < 0$; $\beta_3 < 0$), it is indicative of the fact that ECG impedes higher levels of industrial development in South Africa and the moderating effect with prevalent levels of IQ further aggravates this effect.

By seeking to identify these, together with other long-run elasticities between the variables, the study made use of three different estimation techniques. These were selected on the premise of ensuring the results for each could be benchmarked to the next, so as to ensure the reliability of the findings. Moreover, their use complements one another, mainly through the unique advantages each holds. The first selected technique comprised Phillips and Hansen's [86] fully modified ordinary least square (FMOLS) technique. This technique affords the ability to overcome possible estimation bias, serial correlation, and endogeneity by accommodating specific nuance parameters. After this, the second technique employed was Saikkonen's [94] dynamic ordinary least square (DOLS) estimator. Over and above its shared strengths with the FMOLS technique, DOLS estimation can account for small sample bias and the

issue of simultaneity. This is done through its unique use of both leads and lags in the estimation procedure. Finally, the third estimator to be utilised was Park's [83] canonical cointegration regression (CCR). In comparison with the two aforementioned techniques, it differs in the respect that it transmutes both the data and the parameters. By doing so, CCR estimation can overcome challenges, specifically relating to omitted variable bias in the determination of the elasticity coefficients. Finally, to check for the reliability of the three different estimations techniques, various diagnostic tests were performed on the residuals. These included tests for normality, autocorrelation, heteroscedasticity as well as Ramsey RESET tests to determine whether the estimated models were correctly specified and that the functional forms were absent of any misspecification concerns.

Causality analysis

Finally, considering the possibility of at least one cointegrated relationship, the analysis proceeded by undertaking causality analysis. This was done by means of a Toda-Yamamoto Granger causality test. The selection of this specific technique over conventional Granger causality was motivated on the premise of its notable strengths. These relate to overcoming associated problems of power and size, through accommodating both $I(0)$ and $I(1)$ variables in its procedure. It uses a block exogeneity Wald test in an augmented VAR model.

Results

Descriptive analysis

As the first part of the analysis, Table 2 shows various descriptive properties of the variables under consideration. From the mean scores shown, mainly for levels of industrialisation (proxied by MVA as % of GDP) on average, industrial activity levels over the last 40 years have been moderate at least. The maximum score of 24.86 per cent of total economic activity was recorded in 1981, with the minimum score of 11.66 per cent more recently recorded in 2020 (also shown in Fig. 1a). In this respect, industrial activity has shown a somewhat declining trend for the last 17 years, reflecting the deindustrialisation narrative that has increasingly been realised [6]. In contrast to this, levels of ECG have steadily increased. As mentioned in Sect. "Literature review", given South Africa's unique integration path into global economic structures, the onset of notable international participation came much later compared to others. This is somehow reflected in the low mean score of 44.55 for the past four decades. Considering that the minimum score here of 29.88 was recorded in 1989 and the maximum score in 2016 (Fig. 1b), the country in this regard has made notable progress.

Table 2 Descriptive overview of the variables. *Source:* Authors' own construction

Statistic/variable	MVA (% of GDP)	ECG	IQ	IQ*ECG	HC	REER	GFCF
Mean	18.2312	44.5574	54.3843	2355.565	62.8900	120.2381	18.1309
Median	19.0026	45.9323	51.5198	2398.238	62.5136	118.5000	17.5000
Maximum	24.8645	58.5779	70.2983	2741.475	75.8097	171.0000	27.3000
Minimum	11.6624	29.2888	42.0462	1630.588	49.5920	91.00000	13.1000
Std. dev	4.4294	9.5870	8.4358	267.6717	8.0763	17.6646	3.7079
Skewness	-0.1691	-0.0162	0.2604	-0.8103	-0.0351	0.8235	1.0851
Kurtosis	1.5285	1.5591	1.7374	3.2914	1.7661	2.4697	2.4375
Jarque–Bera	3.9893	3.6348	3.2642	4.7452	2.6729	5.1339	8.5778
Probability	0.1360	0.1624	0.1955	0.0932	0.2627	0.0767	0.0137
Observations	42	42	42	42	42	42	42

Relating to the other variables included, more especially the levels of institutional quality, estimates from Table 2 show a slightly higher mean value compared to the median, which is indicative of a more rightward distribution. In retrospect, much similar to the changes, for economic integration, institutional structures over the course of the study period have undergone significant fluctuations (reflected in Fig. 1c). For the early 1990s this particularly relates to the transition and adoption of more democratic principles and a neoliberal shift in policy implementation [28]. However, more recent times has seen this element marred by high levels of corruption and a general deterioration in the quality of governance and rule and law within the country.

In addition to these features, further information from Table 2 shows interesting insight into the properties of the data. The Jarque–Bera statistic for six of the seven included variables here suggests normal distribution, as the probability values exceeded the 0.05 threshold. Only for the gross fixed capital formation was this not the case. In addition to this, standard deviation scores were somewhat low compared to the averages recorded. This would infer a lower volatility in the movements of most of the variables. So too were most of the kurtosis scores either below or just over a score of three, suggesting that most variables were considered platykurtic, inferring a lower chance of outliers affecting the outcome of the analysis.

Correlation analysis

Subsequent to the descriptive overview, the analysis proceeded with a pairwise correlation. As alluded to in Sect. "Preliminary analyses", the use here was motivated by first gaining insight into the associations between the variables. Secondly, it also affords an understanding of possible underlying multicollinear relationships. Table 3, in this respect, shows the results, which provide evidence of both negative and positive statistically significant (at

least at the 5% significance level) relationships. For the latter, these associations were identified between MVA and HC, GFCF and IQ, and REER. So too, were similar correlations present between GFCF and both REER and IQ, as well as IQ and REER.

In contrast to these findings, Table 2 shows a total of six negative and statistically significant associations. Interestingly, evidence points to these particular relationships between MVA and ECG, as well as ECG and GFCF, IQ, and REER. Moreover, these inverse movements were likewise evident between the GFCF and IQ. Finally, considering that none of the correlation coefficients exceeded the 0.8 threshold [12], initial indications point to no serious multicollinearity concerns between the independent variables.

Unit root testing

Towards determining the stationarity properties of the data, study employed Zivot and Andrews [120] unit root testing. Results here are reported in Table 4. Given that the test posits the null hypothesis of non-stationarity, the results show that at levels, none of the derived test statistics were considered statistically significant, not even at the 10% significance level. In this case, it inferred the existence of unit root at this order of integration $I(0)$ for all the included variables (considering estimations for both intercept and intercept and trend).

In contrast to these findings, results relating to possible stationarity at $I(1)$ do in fact suggest the rejection of the null hypothesis. Here estimated test statistics for the seven included variables as shown in Table 4 were all statistically significant at least at the 5% significance level. As such, it confirmed the adequacy of the specific cointegration technique that was selected as well as the cointegration regression estimators that were proposed in Sect. "Methods".

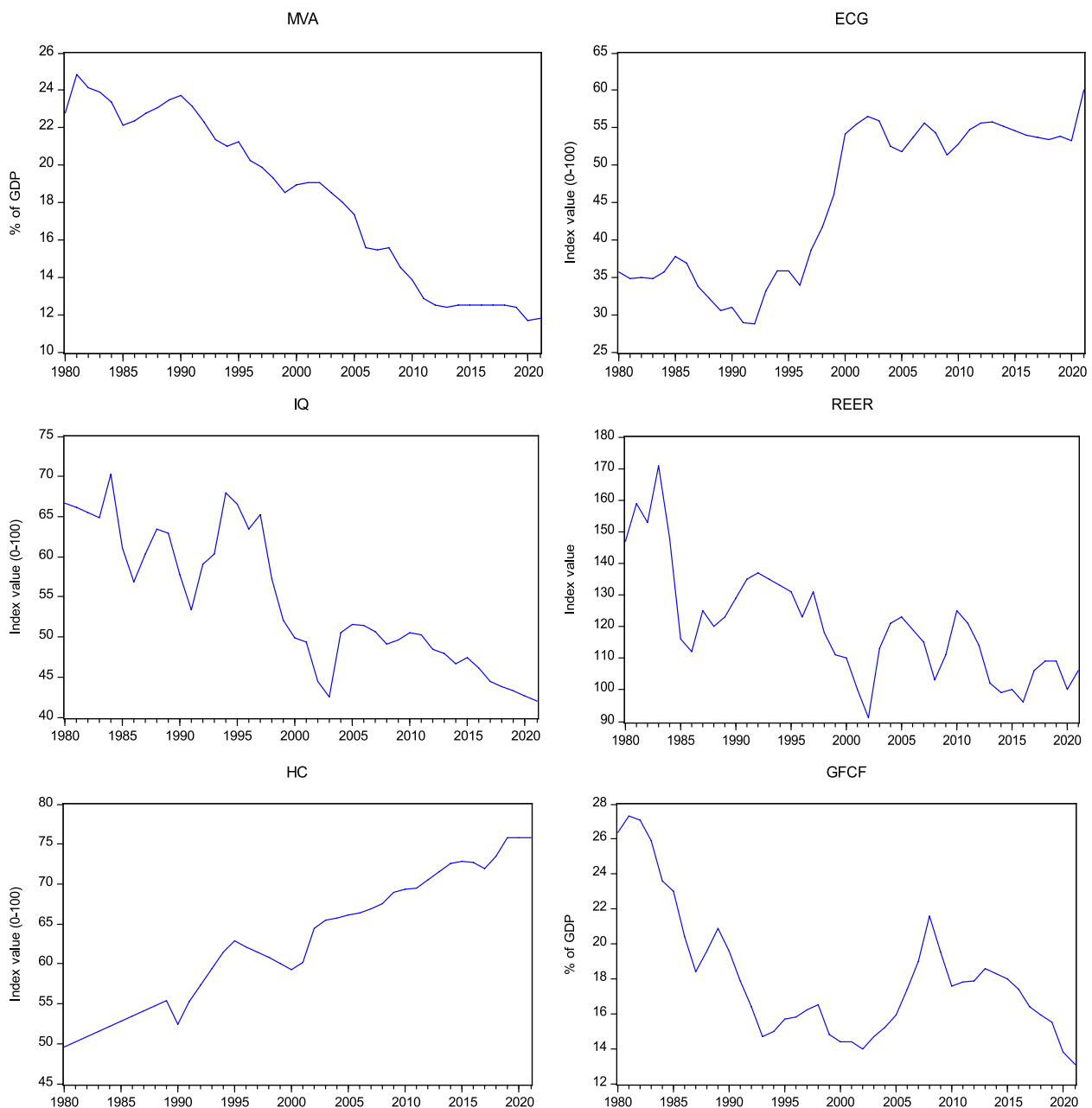


Fig. 1 a-f: Trends analysis for selected variables in the study. *Source:* Authors' own construction from secondary data

Cointegration tests

In order to test possible long-run relationships within this nexus, the analysis made use of the combined Bayer and Hanck cointegration test. Results which are reported in Table 5, firstly for the EG-J-type test, show that the calculated F-statistic substantially exceeds the 1% critical value of 15.348. This would infer, at least on the combined tests of Engle and Granger and Johansen, that the proposed model did indeed exhibit a cointegrated relationship.

Like those mentioned above, the second combined test, which includes both Bosjwik and Banerjee-type tests (shown in Table 5), suggests that interactive effects between IQ and ECG attribute long-run impulses on the country's ability to industrialise. In this instance, the calculated F-statistic (128.603) was much larger than the 1% critical value of 29.544. Both these results support previous studies' findings [41, 80], which likewise showed significant long-run associations within the globalisation, institutional quality, and industrialisation nexuses.

Table 3 Correlation results. *Source:* Authors' own construction

Variable	MVA	ECG	HC	GFCF	IQ	REER
MVA	1.0000					
	–					
ECG	–0.6010*** (0.0000)	1.0000				
		–				
HC	0.4232*** (0.0052)	0.1431 (0.3657)	1.0000			
			–			
GFCF	0.1395 (0.3782)	–0.4934*** (0.0009)	–0.3717** (0.0154)	1.0000		
				–		
IQ	0.4892*** (0.0010)	–0.7359*** (0.0000)	–0.3951*** (0.0096)	0.5527*** (0.0001)	1.0000	
					–	
REER	0.4642*** (0.0020)	–0.6302*** (0.0000)	–0.2796* (0.0729)	0.5953*** (0.0000)	0.7969*** (0.0000)	1.0000
						–

Probability values are indicated in parentheses; *** indicates significance at 1% level; ** at 5% level; * at 10% level.

Table 4 Zivot and Andrews unit root results. *Source:* Authors' own construction

Variable	Intercept	Break year	Intercept and trend	Break year	Stationary
MVA	–3.161	2006	–2.918	2006	No
ECG	–3.868	1987	–4.379	1997	No
IQ	–4.422	1998	–4.568	1998	No
IQ*ECG	–3.623	2004	–3.672	1994	No
HC	–4.527	1998	–4.606	1998	No
REER	–4.261	1998	–4.474	1989	No
GFCF	–4.123	2005	–3.063	2006	No
Δ MVA	–7.387***	1991	–7.638***	1991	Yes
Δ ECG	–5.695***	1994	–5.674***	1994	Yes
Δ IQ	–6.267***	2004	–6.198***	2004	Yes
Δ IQ*ECG	–6.904***	1992	–6.976***	1992	Yes
Δ HC	–5.411***	2001	–5.423	1996	Yes
Δ REER	–5.348***	2003	–5.286**	2003	Yes
Δ GFCF	–5.660***	2009	–5.607***	2009	Yes

*** indicates significance at 1% level; ** at 5% level; * at 10% level

Table 5 Bayer and Hanck cointegration results. *Source:* Authors' own construction

Model	Bayer-Hanck test	F-statistic	Critical value (1%)	Cointegration
$MVA = f(ECG, IQ, IQ*ECG, REER, GFCF, HC)$	EG-J type test	56.306***	15.348	Yes
	EG-J-Ba-Bo type tests	128.603***	29.544	Yes

*** indicates significance at 1% level; ** at 5% level; * at 10% level

Regression results

In light of confirming the existence of the long-run relationship, the long-run elasticity coefficients were estimated using three different estimation techniques. The selection of these was made to ensure the reliability of the results by identifying whether consistent estimates would be achieved using different estimations. In this

regard, Table 6 provides the results for the FMOLS, DOLS, and CCR regressions. From the results, all three estimations confirm that the country's economic integration has positively affected its industrial trajectory. The coefficients were positive and statistically significant (at the 1% significance level). Elasticities ranged between 0.463 and 0.718, suggesting that, at minimum, a 1-unit

Table 6 Regression results. Source: Authors' own construction

Variable	FMOLS		DOLS		CCR	
	Coefficient	t-stat. (Prob.)	Coefficient	t-stat. (Prob.)	Coefficient	t-stat. (Prob.)
ECG	0.463	3.134*** (0.003)	0.718	7.542*** (0.000)	0.508	3.041*** (0.004)
IQ	0.406	3.770*** (0.001)	0.592	8.101*** (0.000)	0.438	3.639*** (0.001)
IQ*ECG	-0.010	-3.974*** (0.000)	-0.014	-7.168*** (0.000)	-0.011	-3.649*** (0.000)
HC	-0.528	-12.877*** (0.000)	-0.614	-28.643*** (0.000)	-0.533	-12.575*** (0.000)
REER	0.001	0.114 (0.909)	-0.012	-0.920 (0.373)	0.003	0.233 (0.8169)
GFCF	-0.107	-1.647 (0.108)	-0.179	-2.662** (0.018)	-0.130	-1.537 (0.133)
C	35.396	6.669*** (0.000)	30.698	9.473*** (0.000)	33.519	5.796*** (0.000)
R ²	0.771		0.798		0.769	
Adjusted R ²	0.766		0.796		0.762	
Jarque–Bera	0.269 (0.874)		0.703 (0.704)		2.493 (0.287)	
LM test	0.014 (0.986)		0.083 (0.919)		0.508 (0.607)	
White test	0.770 (0.577)		0.853 (0.600)		0.635 (0.793)	
Ramsey RESET	0.085 (0.932)		0.309 (0.759)		1.278 (0.223)	

Probability values are indicated in parentheses; *** indicates significance at 1% level; ** at 5% level; * at 10% level.

increase in the economic globalisation index would induce an additional 0.463 to 0.718 per cent increase in the contribution of the manufacturing sector in relation to total economic output of the country. As such, it has received a major share of international support relating to levels of FDI, trade partnership formation as well as various investment agreements. Taking this into consideration these findings tend to support those of Baldwin and Venables [10].

Much similar to these findings, so do the estimates from the regressions in relation to the levels of institutional quality infer a conducive relationship (statistically significant at the 1% level). From the utilised IQ index, results posit that a one-unit increase would induce between 0.406 and 0.592 per cent of the contribution of the industrial sector to total GDP, *ceteris paribus*. This finding is indeed in line with a priori expectations [82].

While the aforementioned findings provide notable insight into this nexus, an interactive variable was used to understand the interplay between the country's institutional structures and its integration into global economic networks. Results for this particular variable are shown in Table 6 and provide interesting findings. Estimates from the FMOLS estimation infer a negative ($coeff. = -0.010$) and statistically significant (at the 1% significance level) effect. These findings are also supported by the DOLS ($coeff. = -0.014$; $t-stat = -7.168$) and CCR ($coeff. = -0.011$; $t-stat = -3.649$) regressions. Based on this, the analysis provides evidence of an

offsetting effect, suggesting that current institutional structures diminish the positive returns of the industry due to the country's global participation in trade and financial markets. In other words, considering the timeframe of the study, while participation in international economic frameworks seems to have driven industrial activity over the last four decades, the institutional environment has hindered this contribution. These results support those showed by Ogbonna et al. (2022). In their study focusing on the African continent, governance institutions likewise showed a dampening effect in the FDI-economic growth nexus.

In relation to the included control variables, the most pertinent finding here is related to the somewhat ambiguous statistically significant (at the 1% level) and negative impact of levels of human capital on the industrial development of the South African economy. Similar to these unexpected relationships, upon review of the estimates for levels of GFCF from all three estimations, domestic investment inflows seem to deter the progress made within the country's industrial landscape. Though all three regressions confirm this particular direction of impact, only the DOLS regression could reject the null hypothesis ($coeff. = 0$) at the 5 per cent significance level. As such, the evidence presented here in Table 6 is somewhat ambiguous. Nonetheless, the finding can be explained in the context of a more considerable shift in the movement of investment flows away from traditional industrial sectors. Finally, upon

review of the various diagnostic tests that were included, results shown in Table 6 confirmed that all three estimations were void of any misspecification concerns, and more importantly that no sign of heteroscedasticity or autocorrelation was present in the estimated residuals.

Causality analysis

As the final step in the analysis, the study sought to identify any causal links between the variables. Causality analysis, in this respect, provides notable insight especially towards lending insight into strategy formulation whereby understanding the relevant linkages can be an important tool, especially for policymakers. Keeping this information in mind, Table 7 provides the results for the Toda-Yamamoto granger causality analysis. Evident from the results here are the identified and statistically significant (at least at the 5% significance level) uni-directional causal linkages specifically between ECG, IQ, and HC which are emitted towards changes in the levels of industrial output.

In addition to the aforementioned, given the main focus on levels of institutional quality, results from Table 7 do further infer the impact that institutional factors have on the outcomes of industry. Other interesting results, which also came to light from Table 7, relate to the uni-directional relationship which originates from the levels of GFCF towards levels of economic integration. Both the Chi-square value (6.483) and probability value (0.011) infer the rejection of the null hypothesis (no causality) at the five per cent significance level. Basing this finding within the context of the nexus under investigation, it does showcase the importance of a sound domestic investment climate, especially considering contemporary concerns that have seen these flows decline in almost all areas across the globe [116].

Discussion of results

In light of the results presented in Sect. "Results", several pertinent areas for consideration are illuminated. The descriptive analysis and trends depicted just show how unique South Africa's development path in the context of a globalised world has been. Compared to other African and global counterparts, the onset of notable international economic participation came much later compared to others. Prior to the transition to a democratic state, it was isolated from international participation due to the government's racial segregation policies [66]. This inferred notable import-substitution strategies and a lack of economic diversification [73]. However, from the early 1990s, fiscal and industrial policy focused largely on the adoption of more democratic principles and a neoliberal economic orientation [28]. While industrial activity was earmarked as a social cornerstone in the post-apartheid development agenda, the declining trend shown for the last 17 years though has reflected the premature deindustrialisation narrative that has increasingly been realised [6]. More so, considering the country's institutional framework, recent times has seen this area marred by high levels of corruption, and a general deterioration in the quality of governance and rule and law within the country.

Taking this into consideration, the findings did showcase that the levels of economic globalisation experienced over the last four decades have actively contributed towards stimulating industrial activity. For the country, known to be largely reliant on its natural resources for international global value chain participation (Miao, 2023), these contributions can possibly be offered to the associated knowledge spillovers, capacity for learning and the additional injection trade with international partners within

Table 7 Toda-Yamamoto granger causality analysis. *Source:* Authors' own construction

Variable	Dependent variable					
	MVA	ECG	IQ	HC	REER	GFCF
MVA	–	3.158* (0.075)	0.720 (0.396)	0.482 (0.487)	0.282 (0.595)	0.078 (0.790)
ECG	4.930** (0.026)	–	0.017 (0.894)	0.125 (0.724)	0.353 (0.551)	0.074 (0.784)
IQ	8.552*** (0.003)	1.000 (0.317)	–	0.243 (0.622)	1.156 (0.552)	0.615 (0.432)
HC	12.595*** (0.000)	3.426* (0.064)	1.493 (0.221)	–	2.559 (0.109)	0.0100 (0.920)
REER	0.268 (0.604)	3.732* (0.053)	2.989* (0.083)	0.050 (0.822)	–	3.265* (0.070)
GFCF	2.498 (0.114)	6.483** (0.011)	0.425 (0.514)	0.062 (0.803)	1.660 (0.197)	–

Probability values are indicated in parentheses; *** indicates significance at 1% level; ** at 5% level; * at 10% level.

these sectors have brought with it (Aghion et al., 2019). Even despite its peripheral and low value-added participation, this does infer important policy considerations. Firstly, it shows the importance of industrial policy incorporating the knowledge that the sector's performance is intrinsically connected to both the trade and financial features of the globalisation process [9]. While in large part policy directed towards improving the domestic environment is crucial, these decisions should consider the competitiveness of the sector in the global arena. Central to this, is the formation of sound regional trade partnerships with the African Continental Free Trade Area (AfCFTA) presenting a pivotal opportunity for industrial innovation and the ability to improve the sector's position in key international value chains.

Closely tied to this, are the findings related to the role of human capital in these processes. While studies have pointed to the inducing role of higher level of skills in this nexus [74], results presented in Sect. "Results" showed that past and present human capital levels have not been conducive for a higher industrial trajectory. Much like other African counterparts, the country has continuously struggled with significant skill mismatches and the lack of the needed productivity levels within this sector to remain particularly competitive within the framework of a global industrial landscape [28, 45]. This comes based on more contemporary foci relating to services-led industrialisation paths as the relevance of industries without smokestacks (IWOSS) intensify, GVC participation becomes increasingly prominent, and international capital investment places significant premiums on high value-added activities [8, 105]. Skills development aimed to align with the movement to this services-led industrialisation should thus form a crucial corner stone in the country's industrial policy landscape as it seeks to transition its position at the bottom of these value chains to more rewarding value-added networks.

In addition to these findings, the results also pointed to several important features relating to the role of the quality of the institutional framework. This pertained to both directly affecting the industrial development of the South African economy, and more importantly the mediating effect these frameworks have within the globalisation-industrialisation nexus. Largely for the former, results confirmed, much like in other countries such as India [100], Nigeria [2], and other developing Asian economies [103], the positive and significant effect that stable political environments and quality bureaucratic processes among others have on industrial landscapes. Their role in this respect is based on the provision of sound and conducive frameworks that allow the optimal allocation of resources not only for the manufacturing sector but also

for all economic activities. According to Hodgson [51, 52], this would entail aspects surrounding more complex forms of coordination, the creation of conducive business environments as well as allow for a more constitutive role through the augmentation of specific social beliefs and values. The latter is especially noteworthy in the South African context. Given the importance of more enabling democratic values, political stability, and rule of law that came into effect after the end of the apartheid regime in 1994, sound institutions have contributed notably, although at a slow pace, to the structural transformation of the manufacturing sector [44].

Keeping this in mind, as captured in the body of knowledge as well as depicted in the trend analysis (Fig. 1c), the deterioration in IQ over especially the last decade in South Africa has imposed serious hurdles on adequately managing industrial activity within global economic landscape for the country. In this regard the long-run elasticities relating to the mediating effect from all three estimation techniques (FMOLS, DOLS, and CCR) all point to the fact that IQ offsets the positive impact of global economic impulses on the manufacturing sector's performance. This finding seems to suggest that domestic institutional structures are not well aligned with the facilitation of enabling global economic flows. Kumeka et al. [61] reiterate that African countries in general (compared to those in more developed regions) have lacked the capacity to adequately implement responsive policy and strategies in this regard. Albeit strong coordination between both public and private actors [123], there is still much concern from both sides particularly to correct market failures, promote competition, and importantly diversify its economic structures [76]. On the domestic level, improvements have spoken to the progress of structural transformation from an institutional perspective; however, when considered in the global context, these positive effects are diminished. This can be attributed to the constraints that additional levels of bureaucracy have inferred, specifically relating to the cost of doing business [119]. Considering that all countries have increasingly been exposed to a global financial market, the attraction of these flows has become increasingly competitive [93]. By not structuring more enabling environments in this respect, crucial forward and backward linkages between foreign and domestic firms can be diminished [41].

Likewise, the explanation can possibly be afforded to the impact of corruption on the distribution of international economic resources that have crossed the borders of the country. For the last two decades, this has particularly become a concern as specific regulatory environments have deteriorated, both from a public sphere as well as corporate space, imposing significant financial distortions and a loss of valuable assets required to

improve industrial activity. Findings from the causality analysis reaffirmed this concern pointing to important considerations relating to the specific nature of industrial activity and the investment decisions surrounding this sector. As explained by Chang and Andreoni [22], financial capital invested in specific assets that enable industry development is most likely to require long-term commitments. The role of both corporate and public governance in this respect is to create stable and conducive environments for businesses to function and limit any market failures that may arise due to the integration of international economic networks. The failure to do so would most likely see volatile levels of foreign capital commitments and the inability to foster needed levels of innovation and continuous spill-over effects.

Conclusion

For the most part, this study sought to provide insight into a crucial aspect in which the current body of knowledge has provided limited insight. It has shown just how intricate the relationships between institutional quality are in relation to the linkages between economic globalisation and the industrial development within a developing country context. The findings in this regard showed that contrary to popular belief the integration of the South African economy has provided additional capacity in its industrial trajectory. However, the prominence of a deteriorating institutional landscape has diminished these effects. By isolating these impulses, it provides important considerations. Among these firstly relates to the imperative understanding that industrial sector's performance has become increasingly interconnected in the global landscape attesting to the prominent role that trade partnership formation, capital account liberalisation, and GVC participation have come to play. More importantly, this all seems to depend on the alignment of institutional structures, especially to external impulses. From a local perspective, these structures seem to have allowed for the progressive development of industry, possibly through the various structural changes that have occurred after the transition to a democratic era, culminating in a more inclusive landscape. However, as the country faces specific challenges relating to corruption in both its public and private sectors, a deterioration in the rule of law, and notable bureaucratic inefficiencies, these challenges have hampered its ability to successfully leverage the integration process to its benefit.

This has revolved around the complexity of mitigating external market failures that have been associated with economic globalisation. So too, does it relate to inability to foster a domestic institutional climate capable of attracting the needed foreign capital and financial flows that have become increasingly volatile

as the expansion and liberalisation of these markets have induced significant levels of competition. All this holds important implications for policy makers not only in South Africa but so too other sub-Saharan African countries and transitioning economies in Southeast Asia, specifically relating to increasing these countries peripheral positions in global economic networks and the upliftment of its population's standard of living. Based on this, the study recommends that the enhancement of institutional quality needs to be prioritised. Key focus areas include governance, increased transparency, and the presence of the rule of law. To address the decline in industrial activity, it is vital that corruption is addressed together with maladministration to create a productive and conducive business environment and to safeguard all institutional frameworks. This approach will not only ensure adherence to the rule of law but also promote the economic growth that South Africa requires. Investing in human capital development by way of addressing skills mismatches while investing in education and training programmes that align to the needs of the industrial sector likewise is crucial. Such measures will enhance competitiveness in the global industrial arena. Additionally, regional corporation through collaboration must be bolstered to allow greater market access and strategic distribution of resources with the aim to promote industrial cooperation. Consistent with these recommendations, policy makers should develop strategies to align institutional frameworks to improve global economic exchanges. By controlling bureaucratic influence or reducing bureaucracy levels, there can be significant enhancements in industrial activity. Consistent with these suggestions, further areas for research have been identified that could potentially be explored in other developing countries facing similar issues. A more regional focus on this relationship through means of a panel study posits several methodological advances. Moreover, different measures of industrialisation and institutional quality can be used to allow for more specific insights, where the institutional quality index can further be modified to reflect country-specific traits. Variables such as regulatory quality could assess the effectiveness of regulations in fostering private sector growth and business ease, while including the conflict and security variable can provide insight on how internal and external conflicts are managed. Infrastructure quality and judicial independence are also among the key variables that can be considered in the analysis of this relationship in different settings. Both these aspects were considered notable limitations for the inquiry.

Abbreviations

ADF Augmented Dickey-Fuller

CCR	Canonical cointegration regression
DOLS	Dynamic ordinary least square
ECG	Economic globalisation
EG-J	Engle Granger and Johansen
EG-J-Ba-Bo	Engle Granger, Johansen, Banerjee and Boswijk
FMOLS	Fully modified ordinary least square
GDP	Gross domestic product
GFCF	Gross fixed capital formation
GVC	Global value chains
HC	Human capital index
ICRG	International Country Risk Guide
IQ	Institutional quality
IWOSS	Industries without smokestacks
KPSS	Kwiatkowski-Phillips-Schmidt-Shin
MVA	Manufacturing value added
REER	Real effective exchange rate
SARB	South African Reserve Bank
UN	United Nations
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
VAR	Vector autoregressive

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Author contributions

All authors contributed to the study conception and design. The methodology, data collection, and analysis were performed by JDJ and KM. The first draft of the manuscript was written by all authors where specifically the introduction and literature review were completed by PM, BW, and PMM. JM wrote up the recommendations and conclusion section. All authors read and approved the final manuscript.

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Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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