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Value-adding effect of foreign direct investment inflow on manufacturing: evidence from South Africa

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ABSTRACT

The manufacturing sector drives economic growth and structural transformation by fostering job creation, innovation and exports. Achieving and sustaining high-income status is challenging without manufacturing development, except for oil-rich nations and small financial hubs. Existing studies have overlooked the relationship between foreign direct investment and manufacturing value-added in emerging markets such as South Africa. This investigation examines the influence of foreign direct investment on manufacturing value added in South Africa. We utilised annual data from 1970 to 2020 and analysed them using linear and nonlinear autoregressive distributed lag (ARDL and NARDL) models to account for possible asymmetric effects. The ARDL analysis reveals that both foreign direct investment inflow and domestic investment negatively impact manufacturing value added in the short and long runs. Under asymmetry analysis, adverse shocks to foreign direct investment negatively affect manufacturing value added more than positive shocks. Positive and negative shocks in trade openness significantly boost MVA, highlighting globalisation's role in economic growth. These findings underscore the nuanced dynamics between investment flows, trade openness and manufacturing performance. By incorporating asymmetric effects, our study provides new insights for policymakers. The results suggest that strengthening domestic resources mobilisation can support manufacturing growth, reduce reliance on external capital inflows and mitigate vulnerabilities linked to geopolitical risks.

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1. Introduction

The manufacturing sector serves as a catalyst for economic growth and structural transformation, contributing significantly to job creation, technological innovation and exportation. Thus, it is hard for countries to achieve and sustain high-income status without developing their manufacturing sector, except for oil-rich countries and small financial hubs (Lautier, 2024; KPMG, 2014). A strong and vibrant manufacturing sector precipitates industrialisation. As such, the manufacturing sector is often viewed as the optimal driver for economic growth in developing economies, including South Africa, because of its labour-intensive nature (KPMG, 2014). Foreign direct investment (FDI)[1] fosters manufacturing capabilities by injecting essential capital and enabling technology spillover to domestic firms. This enables local firms to adopt modern production techniques and effective management practices, boosting productivity and raising the economy's manufacturing value-added (MVA). Consequently, export expansion directly relates to a country's economic success as adding value to products before they are sold boosts

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revenue and raises average earnings per input. Besides, manufacturing is more sustainable and resilient to external shocks than commodities (KPMG, 2014), and the South African government acknowledges the manufacturing sector's economic growth and employment generation role.

Through the National Development Plan, the South African government targeted FDI inflows of $100bn and a 6% reduction in unemployment by creating 11 million jobs by 2030 to achieve its macroeconomic objectives. Hence, the necessity for structural transformation of the South African economies arises from the following. First, there is a need for high and sustained economic growth to absorb the rising youth unemployment. Second, the desire generates increased productivity to raise income and counteract the widening income inequality and high poverty rate. However, while the manufacturing sector ranks as the fourth most significant contributor to GDP (Stats, 2019), her contribution to GDP and employment is nosediving (Bhorat & Rooney, 2017). Notably, her contribution to economic activities declined from 23.1% in 1993 to about 13.2% in 2021. Employment also dropped from about 1.4 million in 2005 to 1.09 million in 2021. Textiles, clothing, food and beverages, and metal and machinery are the most affected sectors (De Beer, 2023; IDC, 2021). Edwards and Jenkins (2015) ascribed the observed decline in South Africa's manufacturing sector contributions to overall economic activities to globalisation. China joined the World Trade Organisation (WTO) in 2001, South Africa became a member of the BRICS in 2010 and the Belt and Road Initiative strategy in 2013 (Avenyo et al., 2024). However, assessing the impact of these global events, notably China's market-seeking strategy, is beyond the scope of this study. The focus is to examine whether FDI inflow into South Africa boosts MVA, which is crucial in achieving the government's objectives of reducing unemployment by 6% and creating 11 million jobs by 2030.

Even though FDI is viewed as a critical determinant of economic growth in developing countries where capital is scarce because of insufficient domestic savings (Sarker & Khan, 2020, Sarket & Khan, 2020), it is likely to influence the host country's economic progress negatively. For example, resource and market-seeking FDIs seeking resources for their parent companies and markets for finished products are more likely to affect the host country negatively. Ross and Fleming (2022) observed that aggregated FDI stimulate economic growth in the host country, whereas Chinese FDI hurts economic growth in the host country. Similarly, Torreggiani and Andreoni (2023) in South Africa documented that penetration of Chinese imports has a direct negative and a downstream effect on the domestic value chain. This reduces sales and employment growth and increases the chances of shutdown for firms not investing in capacity development. These suggest asymmetric dynamics that desire attention, which have often been ignored in the literature.

Despite the glaring possibilities of nonlinearity in the effect of FDI on economic activities, the linear methodology dominates the empirical literature with no established consensus. Furthermore, the focus has been on the FDI-growth nexus, with limited attention on the FDI–MVA relationship, particularly in South Africa, which faces the triple challenge of high-income inequality, youth unemployment and poverty. For example, Brems (1970); Pegkas (2015); Sunde (2017) observed a positive effect of FDI on growth while Görg and Greenaway (2004) and Jilenga et al. (2016) reported an unfavorable effect. Similarly, Acaravci and Ozturk (2012) and Dinh et al. (2019) reported a mixed relationship. In other studies, FDI has also been found to reduce profits for local companies, which may negatively impact local economies as local firms shut down. Foreign businesses usually have more advanced technology, negatively affecting local firms since they decrease efficiency through competition (Herzer et al., 2008). It has also been documented that FDI assists local economies by providing the capital, skills and technology required to maximize natural resources (Ramesh, 2013). As such, FDI is associated with job creation, enhanced productivity and skill development in developing economies. A few known available studies in South Africa, such as Kolisi (2021) and Habanabakize and Mncayi (2022) examined the manufacturing FDI-Growth and employment-FDI nexus. Torreggiani and Andreoni (2023) and Edwards and Jenkins (2015) looked at China import penetration and its dynamics on South African manufacturing. Based on available evidence, our study is among the earliest to investigate the MVA–FDI relationship in South Africa. We employ the linear ARDL and non-linear ARDL to examine the effect of FDI on MVA and to account for the possibility of an asymmetric effect of FDI on MVA.

Developing industrial capabilities can drive economic development and absorb large volumes of unskilled labor for an economy like South Africa with triple economic challenges. That is, diversifying

from low-productivity agricultural sectors to manufacturing and more productive economic activities. As such, Lautier (2024) argues that economic development is linked to changes in the structure of economic activities, and manufacturing is essential in the structural transformation of traditional economies. Knowing how FDI can help revitalize the MVA is essential. This is because the manufacturing sector offers unique opportunities for economies of scale and a high potential for productivity improvement relative to agriculture or services sectors. Furthermore, manufacturing growth generates externalities in technological development and skill creation with strong forward and backward linkages. Manufacturing output growth, therefore, induces productivity and technology progress in the manufacturing sector and in other sectors through direct production linkages and indirect effects (Lautier, 2024, p.169). Finally, it aligns with the Sustainable Development Goal (SDG) 9, which focuses on building resilient infrastructure, advancing inclusive and sustainable industrialization, and encouraging innovation. Specifically, SDG 9.2 seeks to promote inclusive and sustainable industrialization and, by 2030, significantly raise the industry's share of employment and gross domestic product, which aligns with the South African national development plan. Our study, therefore, fills an essential vault in the literature and makes the following contribution. First, by examining how changes in FDI affect MVA, we contribute to the empirical modeling of the asymmetric effect of FDI in an emerging market, South Africa, using the advanced asymmetric autoregressive distributed lag models (NARDL). Second, our study contributes toward a better understanding of the attainment of SDG 9 by providing policymakers in South Africa and other emerging market economies with deeper insights on policy formulation to drive SDG 9.

The ARDL analysis reveals that FDI inflow and domestic investment adversely affect MVA in the long and short runs. Under asymmetric conditions, positive and negative changes in FDI inflows hinder MVA, with negative changes having a stronger effect. Conversely, positive shocks in domestic investment enhance MVA, while adverse changes, though negative, are statistically insignificant. Positive and negative shocks in trade openness significantly boost MVA, underscoring the importance of globalization on economic activities. Lastly, MVA adjusts to short-run shocks in FDI and domestic investment with a delay of one to two periods.

The rest of the article is divided into three main segments. Segment 2 reviews extant theoretical and empirical studies on the subject. Segment 4 captures the interpretation of the empirical results, while the conclusion and recommendation are presented in the last segment.

2. Literature review

2.1. Conceptual

This literature review seeks to clarify the concepts and review theoretical and empirical literature on the subject matter.

Neoclassical and endogenous growth models justify the notion that FDI promotes economic growth. The Solow model supports the notion that the by-products of FDI, such as capital accumulation and technological progress, engender economic growth and a stable increase in cumulative output in the long run. New growth theories regard technological progress as the epicentre of economic progress. Capital formation in new growth theories includes research and development expenditures, investment in human capital and skill, and tangible capital. These models believe that FDI promotes economic growth by increasing capital accumulation due to increased investment. Due to technology transfer and spillover effects, host economies' total factor productivity (TFP) will increase. FDI increases output and economic growth because it affects capital accumulation and TFP levels. In the 1960s and 1970s, dependency theories criticized the role of FDI in the growth process of developing nations. The argument is that the FDI favors multinational corporations (MNCs) over host nations (Prebisch, 1968). In this context, MNCs become counterproductive to host economies by crowding out local industries and ensuing monopolies. In addition, MNCs may contribute to rising unemployment through inappropriate technology, take undue advantage of natural resources, bring about unfair income distribution, interrupt political procedures and destabilize local cultures in host nations (Prebisch, 1968).

There is no generally accepted theory of FDI in the literature (Denisa, 2010). In a perfect market world, FDI would fail because markets would work efficiently without barriers to trade or competition

(Kindleberger, 1969). Kindleberger (1969) identified two conditions that are sine qua non for FDI. First, foreign businesses must have certain advantages to make the investment worthwhile. Second, markets should be imperfect.

Furthermore, the internalization theory, which is traced to Buckley and Casson (1976), Hennart (1982) and Casson (1983), explains the evolution of multinational companies and their motives for FDI. Dunning (1988) who uses eclectic theory, also considers internalization theory important. The eclectic paradigm was developed by Dunning (1988), and it mixes three different theories of FDI. It is called the O-L-I theory, where O represents ownership advantages, L represents location, and I represents internalization. Ownership includes intangible assets which are, at least for a while, exclusive possessions of a company and may be transferred within transnational companies at low costs, resulting in higher incomes and lower costs (Denisia, 2010). Monopoly over specific advantages aids MNEs in realizing superior marginal success over competitors (Dunning, 1988). These advantages include ownership of natural resources, technology, economies of scale and greater access to financial markets. If ownership is fulfilled, it becomes more advantageous for a firm to use them rather than sell or rent to foreign firms. Location advantages include economic benefits such as quantitative and qualitative production factors, transport costs and market size. Political advantages include government policies that affect FDI flows, and social advantages fall under location advantages. Social advantages include, among others, distance between the home and host countries, diversity of culture and attitude toward strangers.

The last feature of the eclectic paradigm is internalization. According to Dunning (1988), it is profitable for an MNE to use ownership and location advantages with at least some factors from outside the country of origin. Internalization gives a framework for assessing various ways a firm will exploit its powers, from trading goods and services to different agreements that might be signed between firms. OLI parameters are not the same from company to company and vary with a host country's political, social and economic conditions. This implies that the aims and strategies of firms, their sizes and production patterns, may vary according to the challenges and opportunities different countries face. Amongst all the theories discussed above, OLI theory is the most applicable to this study. Furthermore, the OLI paradigm fits the study context since the FDI data is aggregated and not sectoral. Thus, the paradigm incorporates information on the various motives of FDI, such as market, efficiency, resource and strategic asset-seeking FDIs.

Most reviewed studies examining the effects of FDI on value added in the manufacturing sector appear consistent. Moreover, these studies' results reveal that FDI positively affects value added in manufacturing, irrespective of differences in method and period used and country covered (Agu & Okoli, 2015; Chandran & Krishan, 2008; Djulius et al., 2019; Mehtra et al. 2024). In Indonesia, Djulius et al. (2019) studied FDI, domestic investment and MVA in the capital and labor-intensive industries from 2010 to 2015 using panel data regression. Their findings revealed that both FDI and domestic investment positively influenced the value added in the manufacturing sector. In capital-intensive industries, FDI had a positive and insignificant effect on value-added, whereas in labour-intensive industries, the effect was positive and significant. However, the results of this study might have been influenced by the short sample period. Agu and Okoli (2015) assessed the effect of FDI inflow on MVA in Nigeria from 1970 to 2013. They found that FDI inflows spur MVA in the long run based on the results of ordinary least squares (OLS) and vector error correction model (VECM). In Pakistan, the autoregressive distributed lag (ARDL) results revealed that FDI and exports significantly impact MVA in both the short- and long runs (Rahman & Bakar, 2019). Specifically, in the long run, FDI, employment and exports increase value added in the manufacturing sector. This is consistent with Chandran and Krishan (2008) in Malaysia, who recorded that increased FDI contributes to value-added output in the long run.

Azolibe (2021) relied on Dynamic OLS and Fully modified OLS to show the increasing effects of FDI inflow and outflow on the manufacturing sector in the Middle East and North Africa. Other researchers have also shown the consequence of FDI on manufacturing capacity utilization. Among existing studies, Obi-Nwosu et al. (2017) in Nigeria using vector autoregression (VAR) and OLS estimation methods document a positive impact on FDI. In contrast, using the VAR framework, David et al. (2012) demonstrated that FDI is inversely related to manufacturing sector productivity in Nigeria from 1975 to 2008. In line with David et al. (2012), Adejumo (2013) and Ameh (2012) confirmed that FDI has an inverse effect on the manufacturing sector in Nigeria. Conversely, in Malaysia (2008) observed that FDI and manufacturing

growth are independent. The author argues that FDI will foster economic growth only if the host country has sufficient skilled labour. Masron and Hassan (2016) also found no statistical evidence that US FDI inflow into the various manufacturing sectors in Malaysia will generate positive externalities. Using the ARDL, Samantha and Liu (2018) established no significant impact of FDI inflows on industrial sector performance in Sri Lanka between 1980 and 2016. Masron et al. (2012) found that while a positive spillover effect is detected, inward FDI could also present negative consequences.

While the FDI-growth hypothesis has received sufficient attention, the empirical evidence generated is inconclusive. Denisia (2010) submitted that the effect of FDI is complex. For example, a direct relationship (Borensztein et al., 1998; Brems, 1970; Ridzuan et al., 2017; Sunde, 2017) and an inverse (Bende-Nabende, 2002; Inekwe, 2013; Jilenga et al., 2016; Kurtishi-Kastrati, 2013). On the other hand, there is a dearth of studies investigating the implications of FDI for added value in the manufacturing sector, especially in South Africa.

A study investigating FDI data for 69 developing countries to explore the human capital and FDI relationship observed that higher human capital enhances FDI inflows, with differences in FDI explained by variations in human capita across countries. Countries with higher human capital absorptive capacities attract more FDI, which in turn promotes technological advancement through technology and managerial practices (Borensztein et al., 1998; Uwazie, 2015). On the contrary, Bende-Nabende (2001) documented an inverse association between FDI and economic growth in advanced economies (Japan and Taiwan). The findings concur with Görg and Greenaway (2004), who evaluated developing, developed and transition countries and reported an inverse association between FDI and economic growth.

While scholarships on FDI and economic growth are prevalent in South Africa, little attention has been directed toward evaluating the impact of FDI inflows on domestic value addition within the manufacturing sector. Studies on the FDI-growth nexus, such as Fedderke and Romm (2006), Moolman et al. (2006), Strauss (2015), Sunde (2017) and Tshepo (2014) documented a positive relationship between FDI and growth, but foreign divestment is detrimental to economic growth (Habanabakize & Mncayi, 2022; Matekenya & Moyo, 2022). A favorable investment climate and the availability of appropriate skills are indispensable for FDI to drive economic growth (Moolman et al., 2006). In addition to the FDI-growth link, scholars have attempted to uncover the puzzles behind South Africa's economic challenges. It emerges that deterioration in the export-oriented manufacturing sector (Rodrik, 2008), globalization and increased Chinese import penetration into the South African economy exert a considerable adverse effect on the manufacturing sector (Avenyo et al., 2024; Edwards & Jenkins, 2015; Torreggiani & Andreoni, 2023). The high exposure to Chinese imports reduces sales and employment growth and increases the likelihood of shutdown. Despite these drawbacks, Chinese imports boost productivity, reduce employment intensity and lower producer price inflation, thereby lowering overall inflation and production costs in South Africa (Edwards & Jenkins, 2015). Nevertheless, a gap exists in the empirical literature on the impact of FDI on MVA in South Africa and other emerging economies. Apart from Kolisi (2021) and Habanabakize and Mncayi (2022) who came closer to examining the effect of FDI on MVA, no other study has attempted to establish a relationship based on available evidence. Kolisi focused on the manufacturing sector and economic growth and concluded that manufacturing FDI adversely affects economic growth. Similarly, Habanabakize and Mncayi (2022) documented that growth in labour productivity and FDI adversely affect growth in the manufacturing sector. Thus, the MVA and FDI relationship remains unexploited, and this study contributes to the empirical literature from this perspective. Specifically, the study examines the effect of FDI on MVA by accounting for the plausibility of an asymmetric effect. Consequently, we hypothesis as follow:

H_1: FDI will have a positive effect on MVA in South Africa

H_0: FDI has no effect on MVA in South Africa

H_1: The effect of FDI on MVA is symmetric.

H_0: The effect of FDI on MVA is symmetric.

3. Research methodology

3.1. Model specification

The study investigated the consequence of FDI inflow on the growth in aggregate manufacturing using the model specified in Equation (1).

$$\text{MVA} = f(FDI, GCF, TO,) \tag{1}$$

The following Equation is the linear Equation for the model

$$lnMVA_t = \alpha_0 + \alpha_1 FDI_t + \alpha_2 GCF_t + \alpha_3 lnTO_t + \mu_t \tag{2}$$

where *ln* MVA is the logarithm of MVA, measuring the net manufacturing sector's output adjusted for inflation. It is the total value of goods and services produced by the manufacturing sector, accounting for the cost of intermediate of inputs used to produce these goods and services. FDI is measured as a proportion to gross domestic formation and captures the proportion of a country's total investment derived foreign capital inflow, thereby capturing the relative importance of foreign investment in South Africa's overall investment activity. GCF is gross domestic capital formation, which captures the long-term effect of capital accumulation, which is critical for sustained growth in MVA. MVA depends on the level of domestic and foreign investment. As such, omitting domestic capital formation from the model could underestimate the role of capital accumulation in manufacturing, leading to an incorrect estimation of the impact of FDI on MVA. lnTO denotes trade openness, the sum of imports and exports, which is included to capture the effect of international trade and competition. The openness of an economy facilitates knowledge and technology transfer as domestic firms gain access to new technologies, managerial practices and production technologies from the entrance of foreign firms.

3.2. Empirical methodology

The study uses the symmetric and asymmetric autoregressive distributed lag (ARDL & NARDL) approach to cointegration to evaluate the long-run relationship between MVA and FDI inflows. We employ the augmented Dickey–Fuller (ADF) and Elliott et al. (1996) (ERS GLS-ADF) tests to investigate the properties of the data. The essence of unit testing is to avoid spurious regressions. ADF test is an expansion of the Dickey-Fuller test equation. It includes a high-order regressive process in the model. The Equation below shows the ADF model;

$$y_t = c + \beta t + \alpha y_{t-1} + \emptyset_1 \Delta Y_{t-1} + \emptyset_2 \Delta Y_{t-2} \ldots + \emptyset_p \Delta Y_{t-p} + e_t \tag{3}$$

where α is a constant, β is a coefficient on the time trend, and p is the lag order of the autoregressive process. Allowing constraints $\alpha = 0$ and $\beta = 0$ corresponds to modeling a random walk and using constraint $\beta = 0$ corresponds to modeling a walk with a drift.

3.2.1. Linear autoregressive distributed lag (ARDL) model

The ARDL bounds testing approach determines the long-run cointegration between dependent and independent variables. This technique accommodates stationary and first-order nonstationary regressors Philips (2018) and is a robust test of long-run relationships relative to conventional techniques. Furthermore, unlike Engle-Granger and Johansen's tests requiring large sample sizes, ARDL works perfectly with sizes between 30 and 80 (Narayan, 2004). The bounds testing approach detects long- and short-run causal relationships using F-statistics from the restricted error correction model (ECM) derived from the ARDL equation.

$$\begin{aligned}\Delta lnMVA_t = \alpha_0 + \sum_{i=0}^{n} \delta_{1i} \Delta lnMVA_{t-i} + \sum_{i=1}^{n} \phi_i \Delta FDICF_{t-i} + \sum_{t=0}^{n} \psi_i \Delta lnGCF_{t-i} + \sum_{t=0}^{n} \beta_i \Delta lnTO_{t-i} \\ + \varphi_1 lnMVA_{t-1} + \varphi_2 lnFDICF_{t-1} + \varphi_3 lnGCF_{t-1} + \varphi_4 lnTO_{t-1} + \mu_t\end{aligned} \tag{4}$$

where the difference operator is captured by $\Delta lnMVA$, $\Delta lnTGI$ represented the change in the natural logarithm of the variables. The null hypothesis (H_0) of no cointegration ($\varphi_1 = \varphi_2 = \varphi_3 = \varphi_4 = 0$) is tested. After the derivation of the cointegrating relationship, an ECM is applied because a short-term variable

can be affected by shocks. From the ECM model in Equation (5), the short-run coefficients (δ, ϕ, ψ, β, y), are estimated at a given time (t).

$$\Delta lnMVA_t = \alpha_0 + \sum_{i=0}^{n} \delta_{1i}\Delta lnMVA_{t-i} + \sum_{i=1}^{n} \phi_i \Delta FDICF_{t-i} + \sum_{t=0}^{n} \psi_i \Delta lnGCF_{t-i} + \sum_{t=0}^{n} \beta_i \Delta lnTO_{t-i} + \psi\mu_{t-1} + \varepsilon_t \quad (5)$$

where μ_{t-1} represents the error correction term (ECT) while ε_t is the error term. Subsequently, the study also examined the asymmetric long- and short-run relationship between FDI inflow and value-added in the manufacturing sector in South Africa.

3.2.2. Asymmetric autoregressive distributed lag (NARDL) model

Shin et al. (2014) introduce the long-run asymmetric as follows:

$$y_t = \beta^+ x_t^+ + \beta^- x_t^- + \mu_t$$
$$\Delta x_t = v_t$$

where y_t is the natural logarithm of MVA (lnMVA) and x_t represents FDICF, and x_t is decomposed as $x_t = x_0 + x^+ + x^-$ where x^+ and x^- are partial processes of positive and negative changes in $FDICF_t$:

$$y_t^+ = \sum_{j=1}^{t} \Delta x_t^+ = \sum_{j=1}^{t} \max(\Delta x_j, 0), and\ x_t^- = \sum_{j=1}^{t} \Delta x_t^- = \sum_{j=1}^{t} \min(\Delta x_j, 0) \quad (6)$$

Equation (6) depicts the modelling of asymmetric cointegration based on the partial sum decomposition framework proposed by Schorderet (2003) that generalizes the concept of and defines the following stationary linear combinations of the partial sum components.

$$z_t = \beta_0^+ y_t^+ + \beta_0^- y_t^- + \beta_1^+ x_t^+ + \beta_1^- x_t^- \quad (7)$$

where z_t is stationary, y_t *and* x_t is the asymmetric cointegration. It follows that standard linear (symmetric) cointegration is a special case of Equation (8) obtained only if $\beta_0^+ = \beta_0^-$ *and* $\beta_1^+ = \beta_1^-$. Due to the difficulty in interpreting hidden cointegration results, Shin et al. (2014, p.8) imposed the restriction that $\beta_0^+ = \beta_0^- = \beta_0$ such that $\beta^+ = -\beta_1^+/\beta_0$ and $\beta^- = -\beta_1^-/\beta_0$. Shin et al. (2014) applied the framework of Pesaran et al. (2001) to propose the following nonlinear ARDL (p, q) model:

$$y_t = \sum_{j=1}^{p} \emptyset_j y_{t-j} + \sum_{j=0}^{q} \left(\theta_j^{+\prime} x_{t-j}^+ + \theta_j^{-\prime} x_{t-j}^-\right) + \varepsilon_t \quad (8)$$

where x_t is a kx1 vector of explanatory variables such that the hypothesis test for the existence of cointegration is stated as: $x_t = x_0 + x^+ + x^-$, $\emptyset_j$ is the autoregressive coefficient, θ_0^+ *and* θ_1^- are the asymmetrically distributed lag coefficients and ε_t is an error term with zero mean and constant variance, σ_ε^2. Shin et al. (2014) focused on the case where x_t is decomposed into x_t^+ *and* x_t^- around a threshold of zero, thereby differentiating between positive and negative changes in the growth of x_t.

Shin et al. (2014) follow Pesaran et al. (2001), and rewrite Equation (9) in the error correction form as:

$$\Delta y_t = \rho y_{t-1} + \theta^{+'} x_t^+ + \theta^{-'} x_t^- + \sum_{j=1}^{p-1} \gamma_j \Delta y_{t-j} + \sum_{j=0}^{q-1} \left(\varphi_j^{+\prime} \Delta x_t^+ + \varphi_j^{-\prime} \Delta x_{t-j}^-\right) + \varepsilon_t$$
$$\Delta y_t = \rho \xi_{t-1} = \sum_{j=1}^{p-1} \gamma_j \Delta y_{t-j} + \sum_{j=0}^{q-1} \left(\varphi_j^{+\prime} \Delta x_{t-j}^+ + \varphi_j^{-\prime} \Delta x_{t-j}^-\right) + \varepsilon_t \quad (9)$$

where $\rho = \sum_{j=1}^{p} \emptyset_j - 1, \gamma_j = -\sum_{i=j+1}^{p} \emptyset_i$ for $j = 1....p-1, \theta^+ = \sum_{j=0}^{q} \theta_j^+, \theta^- = \sum_{j=0}^{q} \theta_j^-, \varphi_0^+ = \theta_0^+, \varphi_{j'}^+ = -\sum_{i=j+1}^{q} \theta_j^+$ for $j = 1.....q-1, \varphi_0^- = \theta_0^-, \varphi_j^- = -\sum_{i=j+1}^{q} \theta_j^-$ for $j = 1...q-1$ *and* $\varepsilon_t = y_t - \beta^+ x_t^+ - \beta^- x_t^-$ denotes the nonlinear ECT where $\beta^+ = -\theta^+/\rho$ *and* $\beta^- = -\theta^-/\rho$ refer to the corresponding long-run asymmetric parameters. To address the likelihood of nonzero contemporaneous correlation between the explanatory variables and the residuals in Equation (10), Shin et al. (2014) used a reduced form of data-generating process for Δx_t

$$\Delta x_t = \sum_{j=1}^{q-1} \Lambda_j \Delta x_{t-j} + v_t \tag{10}$$

where $v_t \sim iid(0, \sum_v)$ with $\sum_v$ being *kxk* positive definite covariance matrix. Since the focus is on conditional modeling, Shin et al. (2014) express ε_t conditionally in terms of v_t as:

$$\varepsilon_t = \omega' v_t + e_t = \omega' \left(\Delta x_t - \sum_{j=1}^{q-1} \Lambda_j \Delta x_{t-j} \right) + e_t \tag{11}$$

where e_t and v_t by construction are uncorrected and substituting Equation (11) into Equation (9) and rearranging yields the conditional nonlinear error correction model:

$$\Delta y_t = \rho \xi_{t-1} + \sum_{j=1}^{p-1} \gamma_j \Delta y_{t-j} + \sum_{j=0}^{q-1} \left(\pi_j^{+'} \Delta x_{t-j}^{+} + \pi_j^{-'} \Delta x_j^{-} \right) + e_t \tag{12}$$

where $\pi_0^+ = \theta_0^+ + \omega, \pi_0^- = \theta_0^- + \omega, \pi_j^+ = \varphi_j^+ - \omega' \Lambda_j, and\ \pi_j^- = \varphi_j^- - \omega' \Lambda_j$ for $j = 1 \ldots q-1$. Shin et al. (2014, p. 291) showed that Equation (12) accounts for the weak endogeneity of all nonstationary regressors and that the model with an appropriate lag structure yields a model free of residual serial correlation. Thus, the model can be estimated using OLS since the model is linear in all parameters.

Finally, the dynamic asymmetric multipliers which measure the cumulative effects of x_t^+ *and* x_t^- on y_t is given as:

$$m_h^+ = \sum_{j=0}^{h} \frac{\partial y_{t+j}}{\partial x_t^+} = \sum_{j=0}^{h} \lambda_j^+, m_h^- = \sum_{j=0}^{h} \frac{\partial y_{t+j}}{\partial x_t^-} = \sum_{j=0}^{h} \lambda_j^-, h = 0, 1, 2 \tag{13}$$

By construction as $h \to \infty, m_h^+ \to \beta^+, and\ m_h^- \to \beta^-$ where $\beta^+ = -\theta^+/\rho\ and\ \beta^- = -\theta^-/\rho$ are the asymmetric long-run coefficients.

3.3. Data sources

This study used annual time series data from 1970 to 2022 downloaded from the open-access World Bank World development indicators. Data availability made it possible to start in 1970. The focus is to examine the relationship between MVA and FDI. However, we include control variables such as trade openness and domestic investment similar to previous scholarship, such as Azolibe (2021). FDI is measured using net inflows as a percentage of capital formation (FDICF). We proxy trade openness using Trade (% of GDP), while domestic investment is measured by gross capital formation (GCF) as a percentage of GDP.

4. Results and discussion

4.1. Descriptive statistics

Table 1 depicts the summary statistics for the variables used in the analysis. The average mean FDI inflow as a ratio of capital formation 4.45% whereas domestic investment is about five times higher at

Table 1. Descriptive statistics.

Variable	LogMVA	FDICF	GCFGDP	LogTO
Mean	12.47	4.45	21.80	3.85
Median	12.45	2.62	20.18	3.79
Maximum	12.87	35.96	34.12	4.12
Minimum	11.79	−3.19	12.43	3.54
Std. Dev.	0.30	6.37	5.19	0.18
Skewness	−0.37	2.57	0.70	0.05
Kurtosis	2.34	12.87	2.47	1.61
Jarque-Bera	2.10	263.28	4.76	4.02
Probability	0.35	0,00	0.09	0.13
Observations	51	51	51	50

Source: Authors' computation (2023).

21.8% offering a degree of insulation from external shocks to capital inflow. However, the degree of trade openness on average is 3.85% for an emerging market as South Africa, is considered relative to be low. The standard value for the Kurtosis of normality is 3, whereas the value of the Kurtosis of FDI is greater than 3, which signals the presence of leptokurtic distribution in the data. Overall, the variables exhibit leptokurtic and platykurtic distributions with kurtosis greater than 3 and less than 3, respectively, implying that the data is not normally distributed. LogMVA, GCF and LogTO have kurtosis values that are less than 3, showing platykurtic distribution. All the tests were conducted in EViews.

4.2. Unit root test results

Table 2 presents the unit root tests performed using ADF and Elliott et al. (1996) with different data-generating processes. The ADF and Elliott et al. (1996) rejected the null hypothesis of unit root at levels for the variables except for FDI, which Elliott et al. (1996) confirmed to be stationary at levels. However, in the first difference, we fail to reject the null hypothesis of the unit root. Therefore, the series reported in Table 2 are stationary at first difference. The final column of Table 2 confirmed that our variables have a mix of I(0) and I(1) order of integration, which is suitable for ARDL and NARDL modeling.

4.3. Cointegration test results

Table 3 shows the ARDL Bounds test results whereby the F-statistic is used to test the joint significance of the parameters. The computed F-statistic is compared with the critical values of the two bounds, the upper bound I(1) and lower bound I(0). If the estimated F-statistic is higher than the critical value of the upper bound, we reject the null of no cointegration and confirm the existence of cointegration. In contrast, if the F-statistic is below the critical value for the lower bound, we fail to reject the null of no cointegration. If the value of the F-statistic lies between the critical value of lower and upper bound, then the result will be inconclusive.

The null hypothesis of a no-level relationship has been rejected at the 10% and 5% significance levels. The Bound test F-statistics of 6.01 are greater than the upper bound of 4.73 at the 5% level, confirming cointegration between MVA and independent variables. Table 4 depicts the long and short runs analysis using symmetric ARDL.

Our analysis established that FDI as a ratio of capital formation and GCF as a ratio of GDP negatively affect manufacturing value addition. The estimated coefficients are statistically significant at 1% and 10%, respectively. The economic implications of these results are that a one-unit increase in the ratio of FDI reduces MVA by 2.5%. Also, a one-unit increase in GCF as a ratio to gross domestic product reduces MVA by 1.8%. However, the effect of GCF on manufacturing value addition is weak, marginally significant at 10%. These findings appeared strange but concurred with (Edwards & Jenkins, 2015), who noted that rising importation from China caused South Africa's manufacturing output to be 5 per cent lower in 2010 than it would have been otherwise. Similarly, Avenyo et al. (2024), and Torreggiani and Andreoni (2023) observed that rising Chinese manufacturing products in the South African market negatively impact manufacturing firms' productivity and employment growth. For firms with limited investment in capacity development, the rising exposure increases the chances of a shutdown. Habanabakize and Mncayi (2022) and Kolisi (2021) also observed that growth in labour productivity and FDI adversely impact job growth in the manufacturing sector in South Africa, while Kolisi (2021) found that manufacturing FDI impedes economic growth in the long run. Also, Ross and Fleming (2022), using a panel of

Table 2. Unit root test at levels.

	Augmented Dickey–Fuller				Elliot Rothenberg and Stock (ERS-GLS)			
Variables	Trend	Trend & intercept	None	First diff	Trend	Trend & intercept	First diff	I(d)
LogMVA	0.066	0.679	0.999	−4.480***	0.082	−1.277	−6.47***	I(1)
FDICF	0.56	0.000	0.37	−9.370***	−1.455	−5.763***	–	I(0)
GCFGDP	0.612	0.457	0.184	−6.739***	−0.788	−2.312	−6.016***	I(1)
LogTO	0.740	0.773	0.847	−5.752***	−0.870	−1.564	−5.789***	I(1)

***, **, * represent 1%, 5% and 10% significance level.
Source: Authors' computation (2023).

Table 3. Bounds test: trend type: Case 3.

F-statistic	6.006					
T-statistic	−3.95					
	10%		5%		1%	
Sample size	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
45	2.89	3.98	3.54	4.73	4.98	6.42
50	2.87	3.97	3.50	4.70	4.87	6.36
Asymptotic	2.72	3.77	3.23	4.35	4.29	5.61
			t-Statistic			
Asymptotic	−2.57	−3.46	−2.86	−3.78	−3.43	−4.37

* I(0) and I(1) are respectively the stationary and non-stationary bounds.
Source: Authors' computation (2023).

Table 4. Long run symmetry, ardl (3, 2, 2, 1): dep variable = logmva.

Variable	Coefficient	t-statistic	Probability
FDICF	−0.025**	−2.32	0.03
GCFGDP	−0.018*	−1.86	0.07
LogTO	1.35***	5.89	0.00
	Short run symmetry		
Variable	Coefficient	t-statistic	Probability
COINTEQ	−0.146***	−5.11	0.00
ΔMVA(-1)	−0.235*	−1.88	0.05
ΔMVA(-2)	−0.127	−1.27	0.21
ΔFDICF	−0.0004	−0.75	0.46
ΔFDICF(-1)	−0.002**	−2.40	0.02
Δ(GCFGDP)	0.008***	3.95	0.00
Δ(GCFGDP) (-1)	−0.006***	−2.67	0.01
Δ(LNTO)	0.332***	4.71	0.00
Constant	1.17***	5.21	0.00

			Diagnostic tests	
R-squared	0.66			
Adjusted R-squared	0.59	Normality	JB	0.72
F-statistics	6.20	BG	LM test (F-stats prob)	0.35
Prob (F-statistic)	0.00	BFG	hetero (F-stats prob)	0.70

Δ is the difference operator, ***, **, * denotes significance at 1%, 5% and 10%, respectively.

22 countries, established that the general flow of FDI positively influences the host country's economic growth, while Chinese FDI hurts the host country's economic growth. Beyond South Africa, scholars such as David et al. (2012), Adejumo (2013), Ameh (2012), Keji (2023), Marson and Hassam (2016) and Moussa et al. (2019) documented evidence of an adverse effect of FDI on manufacturing value creation in Nigeria, Malaysia and Cameroon. Besides, positive effects of FDI on manufacturing have been recorded in the literature. Amongst the recent studies, Azolibe (2021) and Mehta et al. (2023) documented a positive influence of inward and outward FDI on MVA in the Middle East and North African region and India, respectively. The negative relation can be attributed to the declining importance of South Africa's manufacturing sector in the 1990s (Rodrik, 2008) and the relocation of production from domestic to foreign facilities. For example, mergers and acquisitions (Eren & Zhuang, 2015, p.100) and displacement-competition effect, namely downsizing of manufacturing firms (Torregiani & Andreoni, 2023; Avenyo et al., 2024) which can result in the displacement of local workers. This reduces manufacturing value addition as foreign investors capture profits generated from manufacturing activities. Second, high reliance on FDI to support manufacturing growth due to low domestic savings exposes the manufacturing sector to volatility in FDI flows. This is consistent with SAIIA (2015) which underlined the importance of FDI in bridging domestic saving gap.

Contrary to the negative effect, trade openness exerts a statistically significant and positive effect on value creation in domestic manufacturing, consistent with Azolibe (2021). This underscore the importance of globalization and its spillover effect on the manufacturing through technology transfer. A 1% increase in trade openness results in a 1.4% increase in domestic manufacturing value creation, thereby supporting the idea that international integration is an excellent strategy to increase growth in the manufacturing sector. The error correction model captures the speed of adjusting back to equilibrium and is

negative and statistically significant at 1%. It shows that approximately 0.15% of disequilibrium is corrected each year, and it will take about one year and nine months for total adjustment back to a steady state. The diagnostic tests shown in Table 4 confirm that the model is free of serial correlation and heteroskedasticity, and the residuals are normally distributed.

Furthermore, we extend the analysis beyond the conventional linear modeling documented by incorporating asymmetric effects on FDI on manufacturing value creation. The Bounds Test for asymmetric cointegration (Table 5) yields an F-statistic of 5.72, greater than the 5.41 upper bound critical value at a 1% significance level, supporting the existence of asymmetric cointegration.

Table 6 depicts the long-run asymmetric coefficients for all three independent variables. Positive and negative changes in FDI exert a statistically negative and significant effect on domestic manufacturing value creation at a 1% significance level. A one percentage point increase in FDI is associated with a 1.8% decline in MVA, and a one per cent decline in FDI inflow reduces MVA by 2%. On the other hand, positive shocks to gross domestic capital formation positively influence domestic MVA and negative changes in gross domestic capital formation have a negative but insignificant effect on MVA. The effect of gross domestic capital formation emphasizes the need to increase the proportion of internally mobilizing resources to finance manufacturing. Similarly, positive and negative changes in trade openness have a statistically positive and significant effect on domestic manufacturing value creation at a 1% significance level.

Conversely, the asymmetric error correction reported in Table 7, which captures the asymmetric adjustment back to equilibrium, is negative and statistically significant at 1%. The asymmetric speed of adjustment is relatively rapid, 1.36% per year, implying that it takes approximately nine months to revert to the steady state equilibrium in the event of a shock to the system.

However, only adverse shocks of FDI exert a statistically significant negative short-run effect on domestic manufacturing value creation. This collaborates with Habanabakize and Mncayi (2022) observations that foreign divestment hurts economic growth and development. They noted that the adverse shocks of foreign divestment outweigh the positive effects of FDI inflows into South Africa. On the other hand, both positive and negative shocks of gross domestic capital formation and trade openness control exercise statistically significant effects on domestic manufacturing value addition in the short run. In both the short and long run, we see the critical role of internally mobilized resources and trade integration.

We perform a test for coefficient symmetry to ascertain the robustness of our asymmetric long and short runs. Table 8 reports the individual test for the long and short and the joint test for long and short runs. The null hypothesis of the symmetry long run coefficient was rejected for three independent variables, confirming the existence of asymmetric long run. Also, the null hypothesis of symmetry short-run coefficients was rejected except for GCF. However, the null joint test of both symmetry long and short runs was rejected for all three independent variables at the 1% significance level. Finally, diagnostic tests reported at the bottom of Table 7 confirm that the asymmetric model is free of serial correlation and heteroskedasticity and the residuals are normally distributed.

Finally, we plot the asymmetric cumulative dynamic multiplier graphs to trace the adjustment pattern of MVA to its new long-run equilibriums following positive and negative shocks in the FDI, GCF and trade openness. First, the zero line does not fall within the 95% confidence interval boundary, indicating

Table 5. Asymmetric bounds test: trend type: Case 3.

F-statistic	5.72					
t-statistic	−5.22					
	10%		5%		1%	
Sample size	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
45	2.327	3.541	2.764	4.123	3.790	5.411
50	2.309	3.507	2.726	4.057	3.656	5.331
Asymptotic	2.120	3.230	2.450	3.610	3.150	4.430
			t-statistic			
Asymptotic	−2.570	−4.040	−2.860	−4.380	−3.430	−4.990

* I(0) and I(1) are respectively the stationary and non-stationary bounds.
Source: Authors' computation (2023)

Table 6. Asymmetric long run: dependent variable: D(LogMVA).

Variable	Coefficient	Std. error	t-Statistic	Prob
Positive FDICF(-1)	−0.018***	0.003	−6.90	0,00
Negative FDICF(-1)	−0.020***	0.003	−7.45	0,00
Positive GCFGDP(-1)	0.032***	0.003	10.08	0,00
Negative GCFGDP(-1)	−0.001	0.002	−0.46	0,64
Positive TO (-1)	0.301***	0.126	2.38	0,02
Negative TO(-1)	0.794***	0.116	6.81	0,00

Source: Authors' computation (2024).

Table 7. Short run asymmetric: dependent variable: D(LogMVA).

NARDL(2,4,2,3).

Variable	Coefficient	Std. error	t-Statistic	Prob
COINTEQ	−1.363***	0.188	−7.26	0.00
ΔMVA(-1)	0.215	0.139	1.55	0.13
Positive FDICF	−0.001	0.001	−0.79	0.44
Negative FDICF	−0.005**	0.002	−2.52	0.02
Positive FDICF(-1)	0.018***	0.004	5.14	0.00
Negative FDICF(-1)	0.014***	0.003	4.02	0.00
Positive FDICF(-2)	0.012***	0.003	3.73	0.00
Negative FDICF(-2)	0.004*	0.002	1.84	0.08
Positive FDICF(-3)	0.003	0.002	1.40	0.17
Negative FDICF(-3)	0.002**	0.001	2.13	0.04
Positive GCFGDP	0.019***	0.004	5.04	0.00
Negative GCFGDP	0.010***	0.003	4.04	0.00
Positive GCFGDP(-1)	−0.008	0.005	−1.57	0.13
Negative GCFGDP(-1)	0.008***	0.003	3.04	0.01
Positive TO	0.309***	0.082	3.77	0.00
Negative TO	0.473***	0.158	2.99	0.01
Positive TO(-1)	0.243	0.147	1.65	0.11
Negative TO(-1)	−0.925***	0.181	−5.11	0.00
Positive TO(-2)	0.282***	0.135	2.09	0.05
Negative TO(-2)	−0.765***	0.174	−4.39	0.00
Constant	16.086***	2.218	7.25	0.00
R-squared	0.90		Diagnostic test	
Adjusted R-squared	0.83	Normality	JB	0,980
F-statistic	11.70	BG	LM test	0,940
Prob(F-statistic)	0.00	BPG	Hetero	0,73

Source: Authors' computation (2023).

Table 8. Symmetric test.

Null hypothesis: The coefficient is symmetric.

Variable	Statistic	Value	Probability
Long-run			
FDICF	F-statistic	3.23	0.09
	Chi-square	3.23	0.07
GCFGDP	F-statistic	19.82	0.00
	Chi-square	19.82	0.00
LNTO	F-statistic	4.93	0.04
	Chi-square	4.93	0.03
Short-run			
FDICF	F-statistic	8.34	0.01
	Chi-square	8.34	0.00
GCFGDP	F-statistic	0.35	0.56
	Chi-square	0.35	0.55
TO	F-statistic	10.02	0.01
	Chi-square	10.02	0.00
Joint (Long-Run and Short-Run)			
FDICF	F-statistic	4.31	0.03
	Chi-square	8.63	0.01
GCFGDP	F-statistic	10.01	0.00
	Chi-square	20.02	0.00
TO	F-statistic	5.41	0.01
	Chi-square	**10.82**	**0.00**

Source: Authors' computation (2023).
The level of significance have been added with *, **, **** indicating significance at 10%, 5% and 1% level.

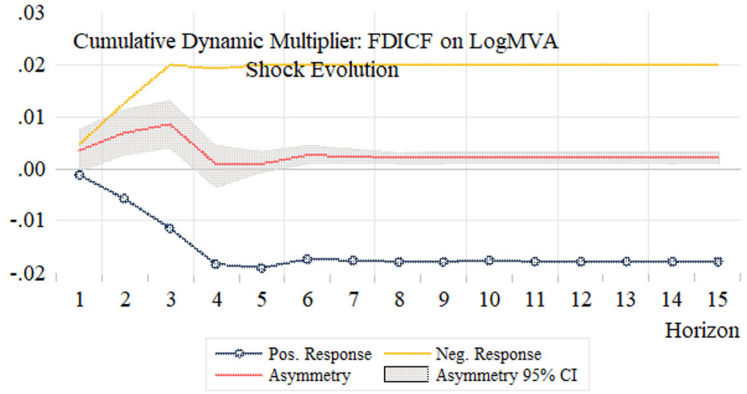

Figure 1. Cumulative multiplier effect of FDICF on LogMVA.
Source: Authors' computation (2023).

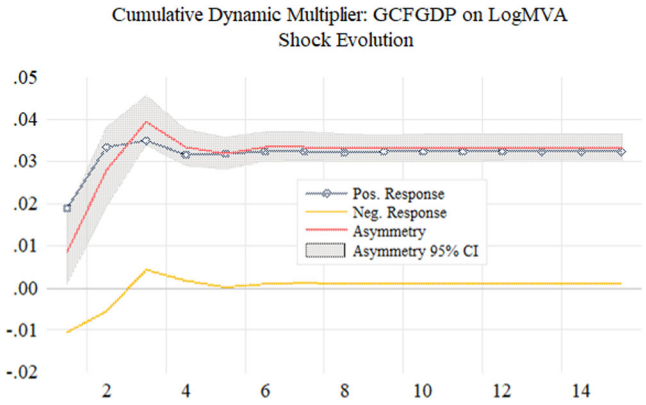

Figure 2. Cumulative multiplier effect of GCFGDP on LogMVA.
Source: Authors' computation (2023).

statistically significant evidence of asymmetry as depicted by Figures 1–3. The response of MVA to positive and negative shocks in the regressors for a horizon of 15 years because our data is annual. Figure 1 shows that a positive increase in FDI exerts a rapid decline in manufacturing value creation in the first five years of the increase and stabilizes from the sixth year. The cumulative dynamic multiplier graph revealed that positive changes in foreign investment have a retarding prolonged effect on domestic manufacturing value creation relative to a reduction in FDI inflows. The observation supports increasing domestic resource mobilization to finance manufacturing growth and reduce reliance on FDI.

Figure 2 depicts the cumulative effect of positive and negative changes in GCF on MVA. The graph revealed that positive shocks in GCF rapidly increased manufacturing value creation in the first three years and stabilized from the fourth year. Conversely, a decline in GCF negatively influenced MVA in the first 3 years and quickly adjusted, and from the fourth year, the negative effect became marginally approaching zero. Also, positive and negative changes in trade openness enhance and depress domestic manufacturing in the third and fourth years, respectively, but positive shocks in trade openness have a prolonged boost in the MVA added than adverse shocks. The economic implications of Figure 3 are that international trade integration is more important for MVA growth than international trade restrictions by the home country.

We tested the stability of the asymmetric ARDL using the cumulative sum of recursive residuals CUSUM and CUSUMSQ graphs in Figure 4. The graphs revealed that the model is stable, as the CUSUM and CUSUMSQ lie within the 95% confidence interval band.

5. Conclusion and recommendations

Our study examined the impact of FDI on MVA in South Africa using annual observations from 1970 to 2022 using symmetric and asymmetric autoregressive distributed lagged (ARDL and NARDL) models. The

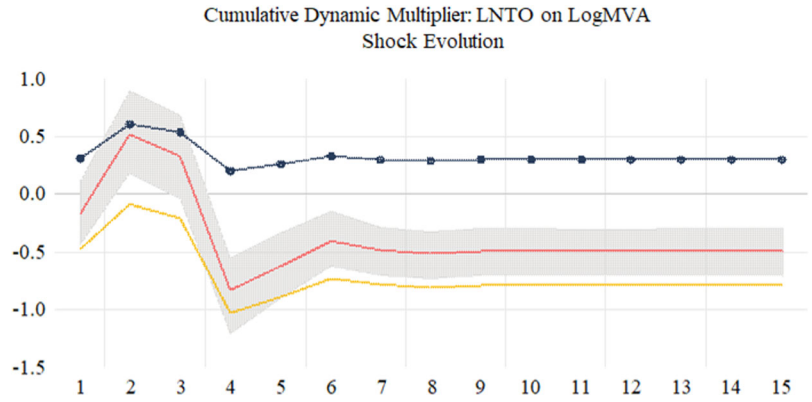

Figure 3. Cumulative multiplier effect of logTO on LogMVA.
Source: Authors' computation (2023).

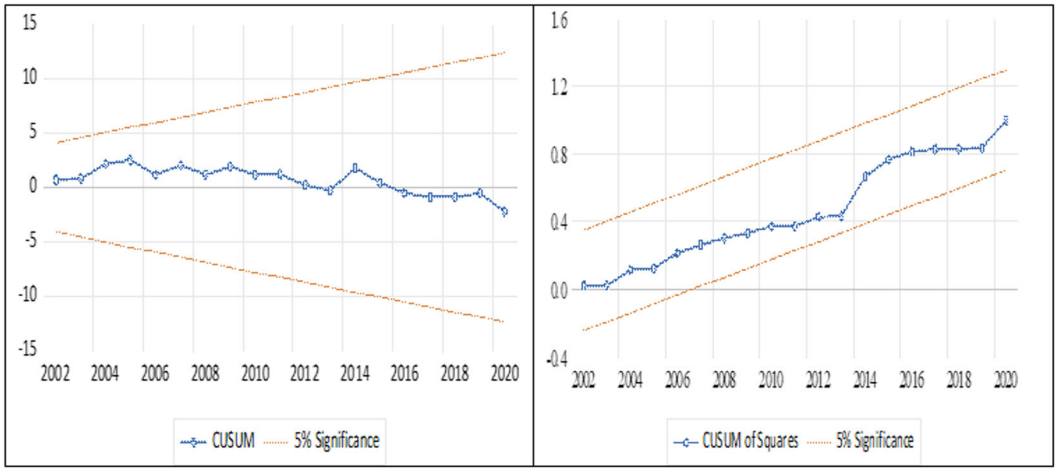

Figure 4. CUSUM and CUSUMSQ.
Source: Authors' computation (2023).

control variables used were GCF, trade openness and FDI, all guided by previous empirical scholars. The Bound test for cointegration confirmed the existence of cointegration in the linear and nonlinear model.

Our results deviate from the usual documented positive effect of FDI on domestic MVA. We established a statistically significant negative long-run effect of FDI on MVA at a 1% significance level. The error correction model was negative and statistically significant at a 1% significance level, implying adjustment to equilibrium in case of a disturbance. The results revealed that GCF exerts a statistically significant negative influence on MVA. Furthermore, trade openness correlates positively with MVA, indicating that international integration is a beneficiary strategy for MVA.

The differentiating factor and novelty of our findings is the incorporation of asymmetric analysis to understand how shocks to FDI influence MVA. Evidence from the NARDL model revealed a statistically significant asymmetric long-run relationship between FDI GCF, trade openness and MVA. We found that a one per cent increase in FDI led to a 1.8% fall in MVA, and a one per cent decline in FDI inflow depressed MVA by 2%. In addition, positive shocks to gross domestic investment positively impact domestic MVA, demonstrating the importance of mobilizing domestic resources to support the growth of domestic manufacturing. Domestic resource mobilization to support manufacturing growth reduces reliance on external capital inflows and shields the countries from vulnerability arising from geopolitical risks. Meanwhile, negative changes in domestic investment have a negative but insignificant effect on MVA. Likewise, positive and negative changes in trade openness have a statistically positive and significant effect on domestic MVA at a 1% significance level. A test for symmetry in the coefficient rejects the

null hypothesis of symmetry in the positive and negative coefficients for individual long and joint long and short runs. The NARDL ECT is statistically significant and negative, indicating adjustment to equilibrium after a shock.

Our study has some policy implications for the South African government authorities. First, to reverse the negative effect of FDI on manufacturing value addition, efforts and efficient strategies must be intensified to mobilize domestic resources. For example, create more public–private partnerships (PPPs), incentives schemes for domestic investment such as tax credits, investment allowances and increased investment in research and development. Second, fostering a culture of investment and saving among South African citizens is essential to expanding the pool of domestic resources necessary to finance manufacturing growth. This can be achieved through initiatives promoting financial literacy and implementing incentive savings schemes. Finally, the amount of resource-FDI and M&A inflows should be regulated because they have limited spillovers and lead to the transfer of ownership from domestic to foreign investors. Industrial policy efforts should be geared toward attracting FDI into Greenfields to establish sustainable manufacturing with high spillovers and economic growth potentials.

This study highlights the disadvantages of FDI, but another dimension remains unexploited. The MVA by the textile and clothing sector has experienced a rapid decline from 12.9% in 1970 to 1.8% by 2021 (World Bank, 2023). South Africa's admission into the global economy in the 1990s and joining BRICS in 2010 exposed the textile and clothing sector to cheaper manufactured textiles from countries with cheap labour, such as China. Further research is required to uncover the forces behind the persistent decline over time of the domestic textile and clothing sector's value-added to provide a framework for policy to resuscitate the sector. South Africa is endowed with abundant natural resources, and FDI in the mining sector may be driven by a resource-seeking strategy rather than building sustainable greenfield manufacturing capabilities. The focus on resource extraction has limited value-added, which marginally contributes to domestic manufacturing value addition in the long term. Final technology plays an important role in the relocation of FDI around the world, especially in the era of Big Data, artificial intelligence and machine learning. These are issues beyond the scope of our study that FDI scholars can pursue to shed light on these intriguing questions.

Note

1. FDI explains acquiring a business outside the owner's country by obtaining lasting management interest of 10% or more (World Bank, 2004). FDI includes equity capital, plough-back profits and other short- and long-term capital. Nunnenkamp (2002) explains three forms of FDI, depending on the objectives. One is resource-seeking FDIs, which are usually motivated by the availability of cheap human capital and natural resources. Another is markets seeking FDIs, which are motivated by growing and increasing market share outside their borders. The last is efficiency-seeking FDIs, which are motivated by gaining access to new sources of efficiency in the form of ease and lower costs of doing business, availability of skilled labour and quality of infrastructure.

Author's contributions

Moreblessing Muneyinazvo Mano: She was involved in the conception and design of the manuscript.

Anthanasius Fomum Tita: He was responsible for acquiring, analyzing, presenting and interpreting the results and formatting the tables and graphs.

Adefemi Obalade: He redrafted and revised the manuscript for intellectual content.

The final version of the manuscript submitted for peer review was approved by all the authors, and we are responsible for all aspects of the work.

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There is no conflict of interest to declare.

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Data availability statement

The data that support the findings of this study are available from the corresponding author, [AAO], upon reasonable request.

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