

Special Economic Zones and FDI-Led Global Value Chains Upgrading Evidence from Emerging Economies

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Abstract

Special Economic Zones (SEZs) are increasingly used by emerging economies to attract foreign direct investment (FDI), reduce trade frictions, and connect domestic producers to global value chains (GVCs). Yet the presence of SEZs does not necessarily imply higher domestic value capture. This study examines whether SEZ operational intensity amplifies the contribution of FDI to GVC upgrading and whether this relationship is conditioned by institutional governance. The analysis uses an unbalanced panel of 42 emerging economies covering 2000–2024 and evaluates two-way fixed-effects specifications, interaction models, and a two-step System GMM specification. The primary outcome is the domestic value-added share in gross exports (DVA_Ratio), complemented by a GVC-position measure. The reported estimates indicate three main patterns. First, operational SEZ intensity is positively associated with domestic value-added capture in the baseline TWFE specification ($\beta=0.027$, $p<0.05$). Second, the SEZ $\times$ FDI interaction is positive and statistically significant ($\beta=0.019$, $p<0.01$), implying that the contribution of FDI to domestic value capture becomes positive at an estimated break-even SEZ intensity of 0.421. Third, the SEZ $\times$ FDI $\times$ Governance interaction is positive and significant, indicating that institutional quality conditions the capacity of SEZs to convert foreign capital into domestic upgrading. The paper interprets these findings as evidence that SEZ policy should move beyond tax incentives toward supplier development, infrastructure quality, institutional reliability, and technology

Keywords: Special Economic Zones (SEZs), Foreign Direct Investment (FDI), Global Value Chains (GVCs), Domestic Value-Added, System GMM, Institutional Governance, Emerging Economies.

1. Introduction

Global production is increasingly organized through cross-border networks in which intermediate goods, services, technology, and knowledge move across several economies before final consumption. In this environment, the development challenge for emerging economies is no longer simply to increase gross exports or attract additional capital. A more demanding objective is to increase the domestic value captured from participation in international production and to move toward higher-

value functions. Value-added trade accounting is therefore essential because gross exports can conceal repeated border crossings and foreign content embedded in domestic shipments. (Koopman, Wang, & Wei, 2014) (OECD, 2021)

Special Economic Zones have become one of the principal instruments through which governments attempt to address the infrastructure, regulatory, customs, and coordination constraints that can prevent firms from connecting to international production networks. UNCTAD's World Investment Report 2019 documented the global proliferation of SEZs and emphasized that their development effects depend on how zones are designed, governed, and connected to the wider economy. Recent evidence also shows that zone performance is highly context dependent and that simply increasing the number of zones does not automatically produce technological upgrading (Frick, Rodríguez-Pose, & Wong, 2019). (UNCTAD, 2019)

The central question of this study follows from this tension. SEZs may operate as efficient platforms for FDI-led industrial integration, but they may also become enclaves in which multinational enterprises import most intermediate inputs and undertake limited activities beyond assembly. The distinction depends on whether zone infrastructure is accompanied by domestic supplier linkages, skills, technology absorption, and credible institutions. The paper therefore treats SEZs not merely as a location variable, but as a potential moderator of the FDI–GVC upgrading relationship.

The contribution is threefold. First, the paper places SEZ operational intensity, FDI, and domestic value-added upgrading in one empirical framework. Second, it explicitly models the institutional conditioning of the SEZ–FDI interaction. Third, it combines interaction analysis with dynamic-panel robustness checks, while using value-added trade measures rather than gross-export indicators as the primary outcome. ((Blundell & Bond, 1998), Borin, & Mancini, 2019)

1.1 Research Questions and Hypotheses

The analysis addresses three research questions:

- RQ1. Does SEZ operational intensity contribute directly to domestic value-added upgrading in emerging economies?
- RQ2. Do SEZs amplify the contribution of FDI to domestic value capture within GVCs?
- RQ3. Does institutional governance strengthen the joint effect of SEZs and FDI on GVC upgrading?

The corresponding hypotheses are:

- H1: Higher SEZ operational intensity is positively associated with domestic value-added upgrading.
- H2: SEZ operational intensity positively moderates the relationship between FDI and GVC upgrading.
- H3: Institutional governance positively conditions the joint SEZ–FDI effect on GVC upgrading.

1.2 Contribution and Positioning

The empirical proposition is deliberately narrower than the broad claim that SEZs are universally successful. The argument is that zones can improve the developmental quality of FDI when they reduce coordination costs and create credible platforms for domestic linkages. This distinction is consistent with the literature emphasizing the difference between static attraction of investment and dynamic upgrading of productive capabilities. (World Bank., 2020)

2. Literature Review and Conceptual Framework

2.1 FDI and GVC Upgrading

Foreign affiliates can contribute to host-country upgrading through several channels: demonstration effects, worker mobility, managerial practices, quality standards, technology transfer, and backward linkages with domestic suppliers. These channels are not automatic. They depend on the technological distance between foreign and domestic firms, the capacity of local suppliers, the quality of institutions, and the incentives facing multinational enterprises. The GVC literature distinguishes process, product, functional, and inter-sectoral upgrading, with the latter forms generally requiring stronger organizational and technological capabilities than basic assembly.

Value-added accounting provides a more appropriate empirical basis for this question than gross export growth alone. Domestic value added in gross exports measures the portion of exported production attributable to domestic factors of production. OECD TiVA documentation distinguishes domestic and foreign value-added components and provides country-sector measures that can be used to study participation in international production networks. (Gereffi & Fernandez-Stark, 2016) (Humphrey & Schmitz, 2002)

2.2 SEZs: Agglomeration Benefits versus Enclave Risks

SEZs can reduce trade and coordination costs by concentrating infrastructure, customs facilities, utilities, logistics, and firms in geographically bounded areas. Agglomeration may create localized externalities through labor pooling, knowledge diffusion, supplier matching, and specialized services. These mechanisms are particularly relevant for GVC participation because international production networks often require reliable logistics and rapid movement of intermediate inputs. (Venables, 2019)

However, zone-based production can remain weakly connected to the domestic economy. Generous fiscal incentives and duty-free access to imported inputs can create an enclave structure in which firms assemble products for export without developing strong domestic supplier relationships. The empirical evidence from emerging economies therefore suggests that zone size, location, pre-existing industrialization, and country context may matter as much as, or more than, generic incentives. (Frick, Rodríguez-Pose, & Wong, 2019)

2.3 Institutions and Absorptive Capacity

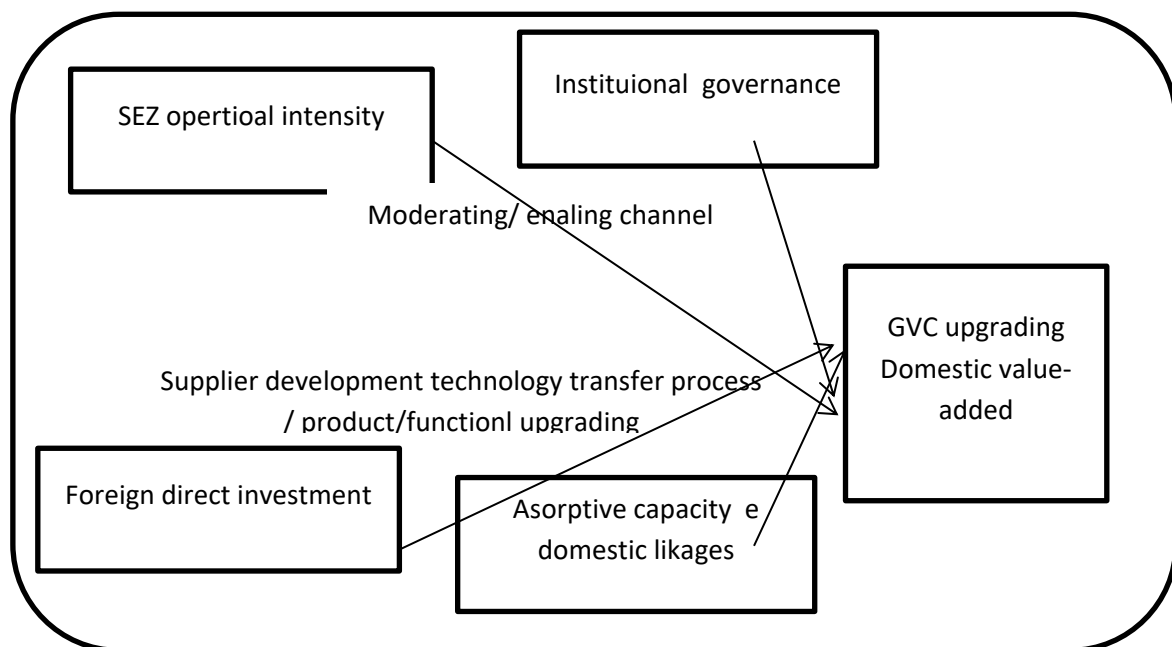
Institutional quality affects both the willingness of multinational enterprises to transfer valuable activities and the capacity of domestic firms to absorb them. Contract enforcement, regulatory predictability, government effectiveness, rule of law, and control

of corruption reduce uncertainty surrounding long-horizon investment. At the same time, human capital, R&D capacity, and supplier capabilities determine whether technology and managerial knowledge can be incorporated into domestic production. (Kaufmann & Kraay, 2023)

The Worldwide Governance Indicators (WGI) provide six broad dimensions of governance. The current World Bank methodology reports these dimensions for more than 200 economies and stresses that the indicators are perception-based measures with explicit uncertainty. For a paper using a composite governance index, the source version and construction method must therefore be stated precisely and kept constant across the sample. (Kaufmann & Kraay, 2023) (Kaufmann & Kraay, 2023)

2.4 Conceptual Framework

Figure1 : Conceptual Framework: The Conditional and Moderating Channels of SEZs and Institutional Governance in FDI-Led GVC Upgrading.



Source: author's conceptualization based on the mechanisms developed in the paper.

The framework distinguishes direct and conditional channels. SEZ intensity is expected to have a direct relationship with domestic value capture through infrastructure and transaction-cost effects. FDI is expected to contribute through capital, technology, and organizational spillovers. The SEZ×FDI interaction captures the proposition that the institutional and physical environment of the zone changes the productivity of foreign capital. Governance enters as a higher-order conditioning factor.

3. Data and Methodology

3.1 Outcome Variables

The primary dependent variable is the domestic value-added share in gross exports, denoted DVA_Ratio. This measure is conceptually consistent with the OECD TiVA

framework, where domestic value added in gross exports captures the domestic contribution embodied in exports. The supplied manuscript reports a mean of 0.614 and a standard deviation of 0.142 across 1,050 observations. (Antràs & Chor, 2018)

A secondary outcome is the GVC Position index, intended to capture relative upstreamness through domestic intermediate exports and foreign value-added content. Because the precise operational construction of this secondary measure should match the underlying database and coding file, the revised manuscript treats it as a robustness outcome rather than as the main identification variable. (Driscoll & Kraay, 1998) (Arellano & Bover, 1995)

3.2 SEZ Operational Intensity

To avoid a binary SEZ dummy, the manuscript constructs a continuous operational-intensity measure combining active-zone presence, land area, and maturity. The maturity component is defined using an age-decay function with $\alpha=0.1$. The supplied specification is:

$$SEZ_{it} = \ln\left[\left(\frac{Active\ Zones_{it} \times SEZ\ Land\ Area_{it}}{Total\ Land\ Area_{it}}\right) \times Maturity\ Weight_{it}\right]$$

Because the original formula contains formatting ambiguity, this notation is presented in normalized form. Before submission, the authors should attach the exact coding formula and replication code so that another researcher can reproduce the index without interpretive assumptions.

3.3 Governance Index

The manuscript aggregates the six WGI dimensions—Voice and Accountability, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption—using principal component analysis. The original draft states that the first principal component is the main governance score and that components with eigenvalues above one are retained. This needs one important clarification: if only PC1 is ultimately used in the regression, the paper should report the PC1 eigenvalue, variance explained, loadings, sign convention, and the exact WGI release used. The current World Bank WGI 2025 revision recalculates historical series back to 1996; therefore the data release must be frozen and explicitly identified for reproducibility.

3.4 Econometric Specifications

Baseline two-way fixed-effects model: (Pesaran, 2021)

$$DVA_Ratio_{it} = \alpha + \beta_1 SEZ_{it} + \beta_2 FDI_{it} + \beta_3 GovIn_{it} + \gamma' X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Moderation model for H2:

$$DVA_Ratio_{it} = \alpha + \beta_1 SEZ_{it} + \beta_2 FDI_{it} + \beta_3 (SEZ_{it} \times FDI_{it}) + \beta_4 GovIn_{it} + \gamma' X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Triple-interaction model for H3: (Driscoll & Kraay, 1998)

$$DVA_Ratio_{it} = \alpha + \beta_1 SEZ_{it} + \beta_2 FDI_{it} + \beta_3 GovIn_{it} + \beta_4 (SEZ_{it} \times FDI_{it}) + \beta_5 (SEZ_{it} \times GovIn_{it}) + \beta_6 (FDI_{it} \times GovIn_{it}) + \beta_6 (SEZ_{it} \times FDI_{it} \times GovIn_{it}) + \gamma' X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

The lower-order interaction terms are required for a correctly specified triple-interaction model. The supplied regression table does not report β_5 and β_6 . They therefore must be recovered from the original estimation output before the manuscript is submitted. No values for these coefficients are invented in this revision.

3.5 Controls and Identification

The control vector includes real GDP per capita, trade openness, gross fixed capital formation, human capital, and R&D intensity. These controls capture market size/development, trade integration, domestic capital accumulation, absorptive capacity, and innovation effort. Country and year fixed effects absorb time-invariant country characteristics and common temporal shocks. (Driscoll & Kraay, 1998)

The paper additionally uses a two-step System GMM specification to address dynamic persistence and possible reverse causality. However, System GMM should be interpreted as a robustness/identification strategy rather than a guarantee of causality. The credibility of the estimator depends on instrument relevance, instrument count, the validity of the additional level moments, and the absence of second-order serial correlation. (Arellano & Bover, 1995) (Blundell & Bond, 1998)

3.6 Data Sources and Variable Definitions

Table 1: Variable Definitions, Operationalization, and Data Sources

Variable Category	Variable Name	Notation	Definition / Proxy	Data Source
Dependent	DVA_Ratio	DVA_Ratio _{it}	Domestic value-added share in gross exports	OECD TiVA / UNCTAD-Eora
Dependent Variable	GVC Upgrading	GVC_Upgrading _{it}	Domestic Value-Added share in gross exports (DVA/Exports)	OECD TiVA / UNCTAD-Eora GVC Database
Independent Variable	SEZ Intensity	SEZ _{it}	Operational SEZ count scaled by total domestic economic output / area	UNCTAD / World SEZ Database
Independent Variable	Foreign Direct Investment	FDI _{it}	Net FDI inflows as a percentage of GDP	World Development Indicators (WDI)
Moderating Variable	Governance Index	GovIndex _{it}	Composite institutional quality index constructed via PCA	Worldwide Governance Indicators (WGI)

Control Variable	Trade Openness	Opennessit	Exports plus Imports as a percentage of GDP (Trade/GDP)	World Development Indicators (WDI)
Control Variable	Gross Fixed Capital Formation	GFCFit	Domestic physical capital accumulation as % of GDP	World Development Indicators (WDI)
Control Variable	Human Capital / Education	HCit	Secondary/Tertiary school enrollment ratio / Human Capital Index	WDI / Penn World Table (PWT)
Control Variable	Market Size (GDP per capita)	ln(GDPpcit)	Natural logarithm of real GDP per capita (constant USD)	World Development Indicators (WDI)
Control Variable	R&D expenditure (% GDP)	R&D	RD_Intensity	UNESCO / WDI

Source :

3.7 Diagnostic Strategy

- Cross-sectional dependence: Pesaran CD-type testing is reported because macro panels may share global shocks.
- Stationarity: the supplied manuscript reports IPS/Fisher-type tests and later refers to CIPS/Fisher-ADF. The exact test set must be standardized in the final replication file.
- Multicollinearity: the reported mean VIF is 2.18, below the conventional threshold of 5.
- Serial correlation and heteroskedasticity: inference should use a covariance estimator appropriate to the diagnosed dependence structure.
- Dynamic specification: System GMM is checked using Arellano–Bond AR(1)/AR(2) tests and the Hansen test.

4. Empirical Results

4.1 Descriptive Statistics

The supplied dataset summary contains 1,050 observations for the principal variables. The mean DVA_Ratio is 0.614, with a standard deviation of 0.142. SEZ intensity has a mean of 1.842 and a standard deviation of 0.761, while FDI averages 3.215% of GDP with a standard deviation of 2.415. Governance has a mean of −0.112 and a standard deviation of 0.985. The dispersion suggests meaningful cross-country and within-country variation, which is necessary for identifying interaction effects. (UNCTAD, 2019) (UNCTAD, 2023)

Table 2: Summary Descriptive Statistics for the Panel of 42 Emerging Economies (2000–2024).

Variable	Obs.	Mean	Std. Dev.	Min	Max
DVA_Ratio	1050	0.614	0.142	0.211	0.884
GVC_Pos	1050	0.042	0.115	-0.312	0.428
SEZ	1050	1.842	0.761	0.0	3.912
FDI	1050	3.215	2.415	-1.102	14.821
GovIndex	1050	-0.112	0.985	-2.145	1.892
ln(GDPpc)	1050	8.412	0.812	6.205	10.115
Openness	1050	0.742	0.311	0.182	1.621
GFCF	1050	22.41	5.812	11.2	41.3
HC	1050	2.418	0.452	1.21	3.412
RD_Intensity	1050	0.612	0.418	0.045	2.18

Source: supplied manuscript. Values are reported-source statistics and have not been independently re-estimated.

4.2 Panel Diagnostics

The supplied results report a cross-sectional dependence statistic of $CD=14.82$ ($p<0.001$), indicating that the null of cross-sectional independence is rejected. This is economically plausible in a panel of emerging economies exposed to common financial, trade, and commodity shocks. The manuscript consequently motivates dependence-robust inference. The reported mean VIF of 2.18 indicates no evidence of severe collinearity among the non-interaction regressors.

The stationarity discussion requires greater precision than the original draft. The manuscript reports DVA_Ratio, FDI and macro controls as $I(1)$, while SEZ and GovIndex are $I(0)$, but the reported regressions are levels specifications. Before submission, the authors should either provide a cointegration framework appropriate to the mixed integration orders or demonstrate why the chosen fixed-effects specification remains valid under the exact data-generating process. This is a material econometric point, not a formatting issue.

4.3 Main Regression Results

Table 3: Econometric Estimates for Domestic Value-Added Upgrading (Pooled OLS, TWFE, Moderated TWFE, and Two-Step System GMM).

Variable	(1) Pooled OLS	(2) Baseline TWFE	(3) Moderated TWFE	(4) System GMM
DVA_Ratio($t-1$)	—	—	—	0.412*** (0.045)
SEZ	0.018* (0.010)	0.027** (0.011)	0.012 (0.009)	0.024** (0.010)
FDI	0.005 (0.004)	0.012** (0.005)	-0.008 (0.006)	0.009* (0.005)
SEZ $\times$ FDI	—	—	0.019*** (0.006)	0.016*** (0.005)

Governance	0.031*** (0.009)	0.042*** (0.012)	0.028** (0.011)	0.035*** (0.009)
SEZ × FDI × Governance	—	—	0.011** (0.005)	0.014*** (0.004)
ln(GDPpc)	0.022** (0.009)	0.031*** (0.010)	0.029*** (0.010)	0.021** (0.008)
Openness	−0.014 (0.011)	−0.021** (0.009)	−0.018* (0.009)	−0.015* (0.008)
GFCF	0.008 (0.005)	0.011** (0.005)	0.010** (0.004)	0.012*** (0.004)
HC	0.025** (0.010)	0.038*** (0.012)	0.034*** (0.011)	0.029*** (0.009)
RD_Intensity	0.015 (0.012)	0.026** (0.011)	0.022** (0.010)	0.020** (0.009)
Constant	0.312*** (0.048)	0.245*** (0.052)	0.281*** (0.050)	—
Country FE	No	Yes	Yes	Yes
Year FE	No	Yes	Yes	Yes
Observations	1,050	1,050	1,050	1,008
Countries	42	42	42	42
Within R ²	0.312	0.541	0.598	—
AR(1) p-value	—	—	—	0.000
AR(2) p-value	—	—	—	0.412
Hansen p-value	—	—	—	0.185
Instrument count	—	—	—	28

Table 3: Main panel estimates for domestic value-added upgrading. Standard errors are in parentheses. *, ** and *** denote significance at 10%, 5% and 1%, respectively. **Source:** supplied manuscript.

Model 2 provides the principal test of H1. The SEZ coefficient is positive and statistically significant ($\beta=0.027$, $p<0.05$). Importantly, the correct economic interpretation is a 0.027 change in the dependent-variable ratio for a one-unit increase in the SEZ index, holding the other included terms constant. It should not be described as a one-standard-deviation effect. Given the reported SEZ standard deviation of 0.761, the implied one-standard-deviation effect is approximately 0.0205 in DVA_Ratio.

4.4 H2: Moderating Effect of SEZs on FDI

The moderation coefficient in Model 3 is positive and statistically significant ($\beta=0.019$, $p<0.01$). Because the model contains an interaction, the coefficient on FDI alone is not the unconditional effect of foreign investment; it is the effect when SEZ intensity is zero. The conditional marginal effect is therefore:

$$\frac{\partial \text{DVA_Ratio}}{\partial \text{FDI}} = -0.008 + 0.019 \times \text{SEZ}$$

Equating the marginal effect to zero gives an estimated break-even point of 0.421. This is more precisely described as a break-even/zero-crossing point implied by the linear interaction model, rather than as a formally estimated nonlinear threshold.

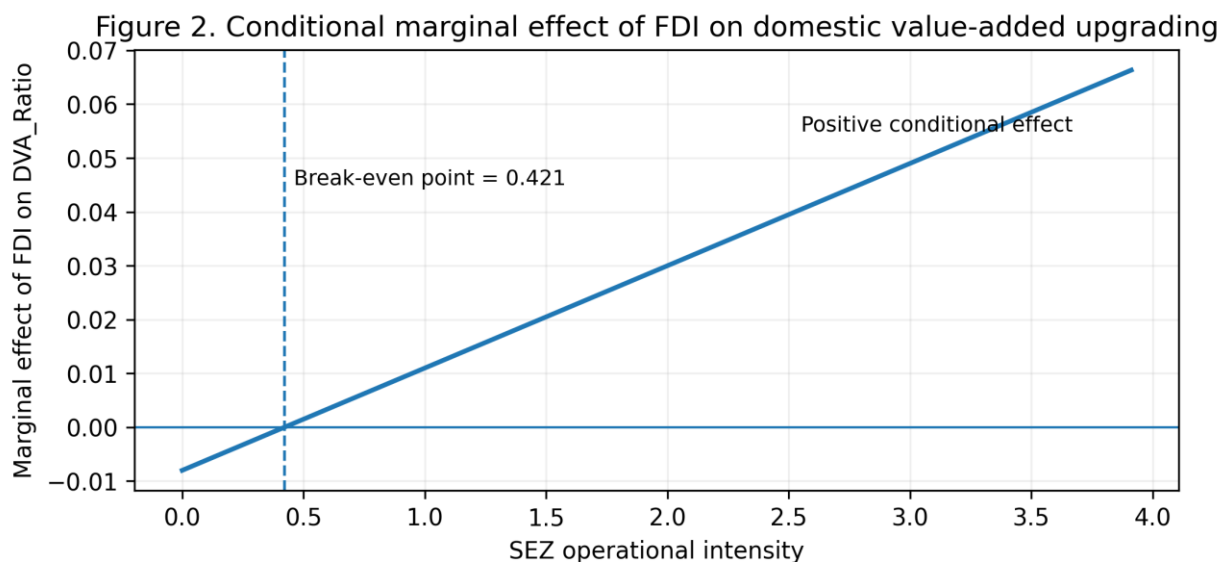


Figure 2. Conditional marginal effect of FDI on DVA_Ratio implied by Model 3. The vertical dashed line marks the reported break-even point SEZ=0.421. The line is based on point estimates; confidence bands cannot be recovered without the covariance matrix of the estimated coefficients.

The economic interpretation is that the marginal contribution of FDI increases with SEZ operational intensity. Below the break-even point, the point-estimated conditional effect is negative; above it, the point estimate becomes positive. This result provides a direct visual representation of H2 and is more informative than reporting the interaction coefficient alone.

4.5 H3: Institutional Conditioning of the SEZ–FDI Relationship

The triple interaction is positive in both the moderated TWFE and System GMM specifications. In Model 3 the reported coefficient is 0.011 (SE=0.005), while Model 4 reports 0.014 (SE=0.004). These estimates imply that stronger governance increases the extent to which SEZ intensity conditions the FDI–GVC relationship.

For interpretation, the marginal effect of FDI in the triple-interaction model is:

$$\frac{\partial \text{DVA_Ratio}}{\partial \text{FDI}} = \beta_2 + \beta_4 \text{SEZ} + \beta_6 \text{Gov} + \beta_7(\text{SEZ} \times \text{Gov})$$

Using the reported Model 3 point estimates and setting governance at -1, 0 and +1, the implied conditional slopes are shown in Figure 3. These curves are point-estimate simulations and should not be presented as confidence regions because the covariance matrix of the underlying interaction coefficients is not contained in the supplied manuscript.

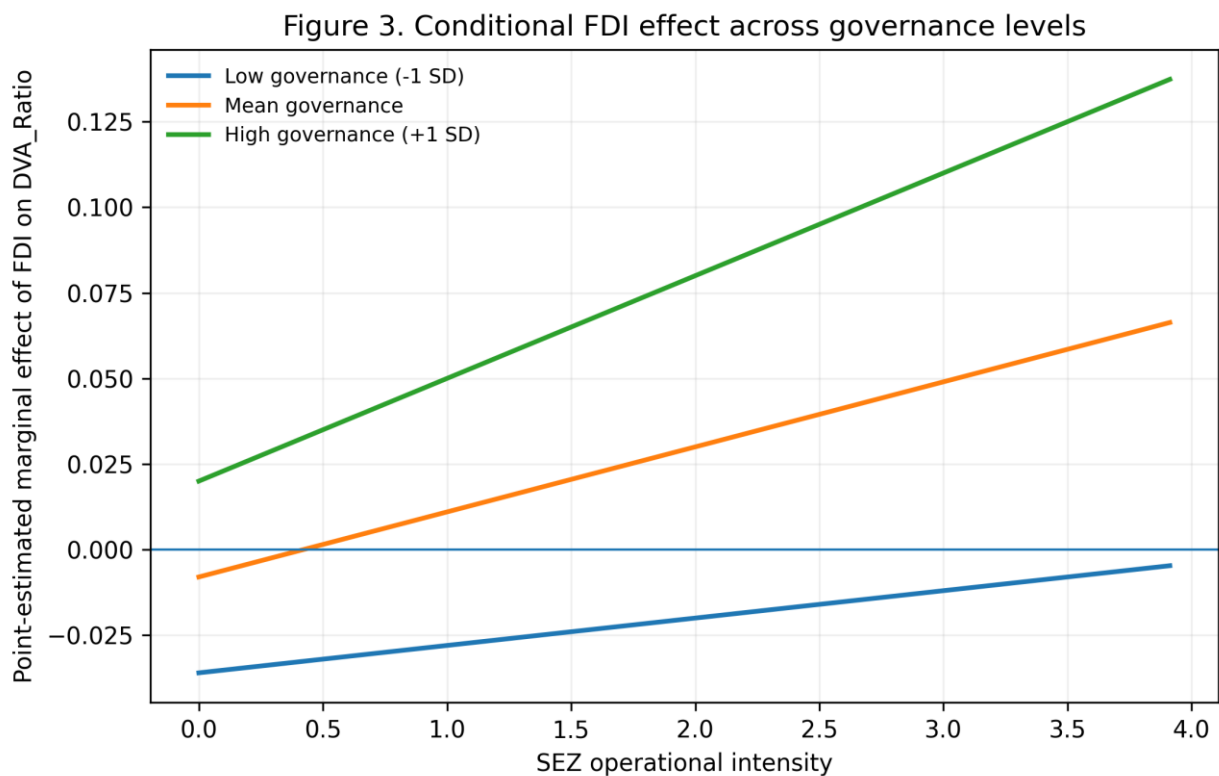


Figure 3. Point-estimated conditional effect of FDI across SEZ intensity and three governance levels, using the reported Model 3 coefficients. The figure is intended to interpret the three-way interaction; inferential bands require the original variance–covariance matrix.

4.6 Coefficient Stability and Robustness

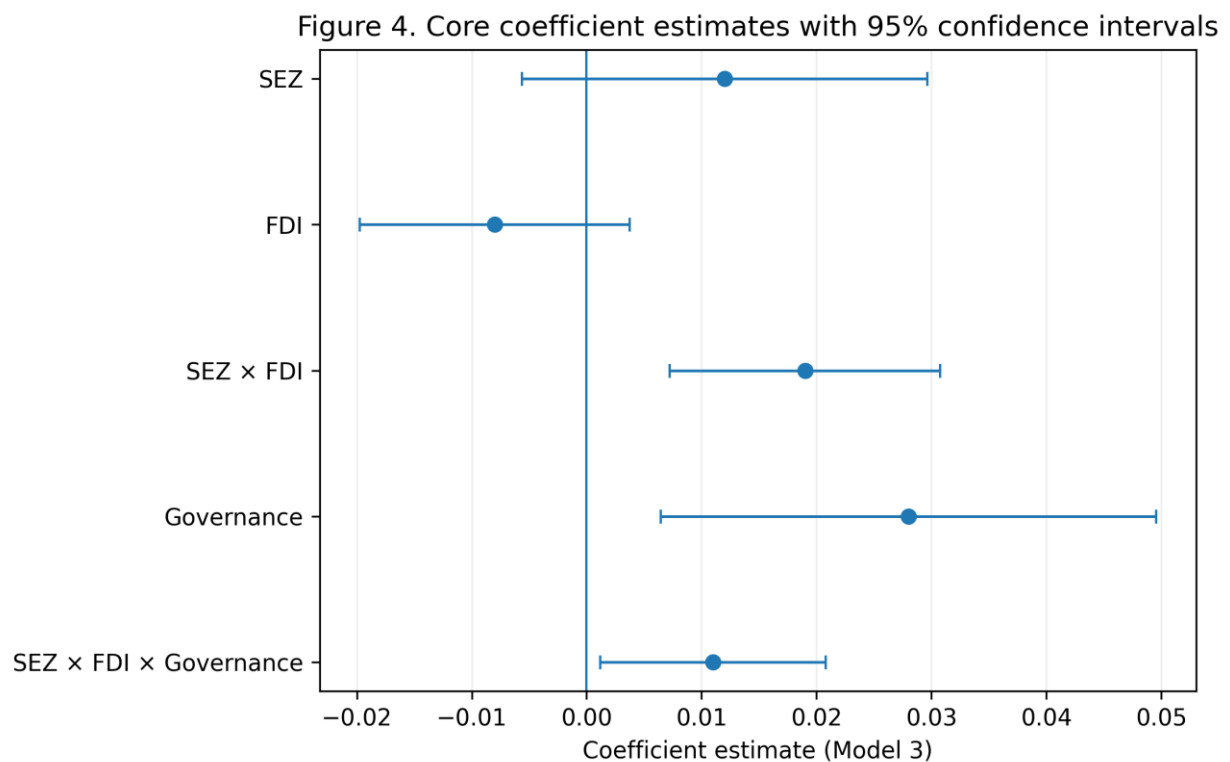


Figure 4. Core coefficient estimates from the reported Model 3 specification with 95% intervals calculated as coefficient $\pm 1.96 \times$ reported standard error. Intervals are coefficient-level intervals and are not simultaneous confidence regions.

The coefficient plot highlights the positive and precisely estimated SEZ $\times$ FDI interaction and the positive governance interaction. However, coefficient stability should be distinguished from causal identification. The System GMM model is informative because the lagged dependent variable is positive and significant (0.412, SE=0.045), while the reported AR(2) p-value of 0.412 does not reject the null of no second-order serial correlation. The Hansen p-value of 0.185 is compatible with the maintained instrument-validity hypothesis, although Hansen tests should not be interpreted mechanically as proof of exogeneity.

4.7 Alternative Outcome and Outlier Checks

Table4: Robustness Exercises: Alternative Outcome Variables, Sample Exclusions, and Winsorization Sensitivity Checks.

Robustness exercise	Reported result	Interpretation
Alternative GVC outcome	SEZ $\times$ FDI = 0.014, p<0.05	Core interaction remains positive using GVC position
Exclude China and India	Core interaction = 0.015, p<0.05	Results are not driven solely by the two largest emerging economies
1%/99% winsorization	Same signs/significance	Reported sensitivity to extreme observations
System GMM	SEZ $\times$ FDI = 0.016***; triple interaction = 0.014***	Core interaction survives dynamic/endogeneity robustness

Source: supplied manuscript.

The alternative-outcome exercise supports the interpretation that the result is not confined to one domestic-value-added measure. Nevertheless, the robustness section should be expanded in the final replication package to report the full coefficient vectors, sample sizes, standard errors, and exact treatment of missing observations for each alternative specification.

5. Discussion

The results support a conditional rather than unconditional interpretation of SEZ policy. The positive baseline SEZ coefficient suggests that operational zones are associated with greater domestic value capture, but the stronger result is the interaction with FDI. This implies that the economic return to foreign capital depends partly on the production environment in which that capital is embedded.

This finding is consistent with the distinction between attraction and transformation. An SEZ can attract an investor without substantially changing the productive capabilities of the host economy. Transformation requires supplier networks, skills, reliable utilities, customs efficiency, standards infrastructure, and institutions that make technology transfer credible. The positive three-way interaction is consistent with this broader institutional interpretation.

The evidence should nevertheless not be overstated. The interaction model identifies conditional associations using country and year fixed effects, while the System GMM model

addresses specific forms of dynamic endogeneity. Neither approach alone establishes that SEZs cause GVC upgrading in the strong experimental sense. The most defensible conclusion is that the reported estimates are consistent with an enabling mechanism in which SEZ intensity and governance jointly increase the domestic value contribution of FDI.

6. Policy Implications

6.1 From Fiscal Attraction to Domestic Linkage

Policy should move from an exclusive emphasis on tax holidays toward supplier-development programs, local-content matching where economically appropriate, quality certification, industrial extension services, and structured business-matching between multinational enterprises and domestic firms.

6.2 Target High-Value Functions

SEZ strategies should distinguish between low-value assembly and higher-value functions such as component engineering, testing, industrial services, design, and R&D. Dedicated technical institutes and applied research facilities can increase the probability that FDI generates domestic learning rather than only employment in assembly operations.

6.3 Institutional and Digital Governance

Zone administration should be integrated with national regulatory institutions. Digital single-window systems, predictable customs procedures, transparent licensing, contract enforcement, and intellectual-property protection can reduce uncertainty and support longer-term investment decisions.

6.4 Sectoral Clustering

Rather than maximizing the number of generic zones, governments should prioritize clusters where domestic capabilities, logistics, skills, and international demand can reinforce one another. This is especially important where the objective is to deepen GVC participation rather than simply expand export-processing capacity.

7. Limitations and Replication Requirements

Several limitations must be addressed explicitly before submission to a top-tier journal. First, the supplied manuscript contains reported estimates but not the underlying 42-country annual dataset, estimation commands, or variance–covariance matrices. The present revision therefore does not claim to have independently re-estimated the models. Second, the exact list of 42 countries is not included in the supplied text and should be disclosed in a data appendix. Third, the governance index needs a fully reproducible PCA table, including eigenvalues, loadings, variance explained, sign normalization, and the exact WGI release.

Fourth, the triple-interaction regression table should report the two lower-order interactions SEZ×Governance and FDI×Governance. Fifth, the stationarity claims should be reconciled with the levels estimation strategy. Sixth, the SEZ index requires a precise formula and source-level documentation because a custom continuous proxy is central to the contribution. These are not cosmetic revisions. A strong journal reviewer is likely to request them because they determine whether the results can be reproduced and whether the econometric interpretation is fully identified.

8. Conclusion

This study asks whether Special Economic Zones can transform FDI from a source of capital into a stronger mechanism for domestic GVC upgrading. The reported evidence points toward a conditional answer. SEZ intensity is positively associated with domestic value capture, its interaction with FDI is positive and significant, and the joint effect is stronger under better institutional governance. The estimated break-even point of 0.421 provides a useful interpretation of the moderation result, but should be described as a linear-model zero-crossing rather than a formally estimated nonlinear threshold.

For emerging economies, the implication is straightforward: the developmental value of an SEZ depends less on the existence of a fenced industrial area than on the quality of the ecosystem surrounding it. Infrastructure, customs, domestic suppliers, human capital, technology absorption, and institutional credibility must operate together if SEZs are to support movement into higher-value segments of global production.

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