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U.S. tariffs, interest rates, foreign direct investment, and manufacturing resilience in Indonesia: Evidence from 2016–2024

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ABSTRACT

Purpose – This study examines how U.S. tariff shocks, foreign direct investment (FDI), Federal Reserve interest-rate conditions, and domestic interest rates are associated with Indonesia's manufacturing resilience. It also reassesses the mediating role of FDI and the moderating role of domestic interest rates.

Design/methodology/approach – A quantitative explanatory design was applied to a secondary-data matrix covering 2016–2024 and containing 64 aligned observations. PLS-SEM was estimated in SmartPLS with 5,000 bootstrap resamples. Measurement quality was reassessed from the reported outer loadings; composite reliability and average variance extracted were calculated from those loadings.

Finding/Results – U.S. tariffs were positively associated with FDI ($\beta = 0.534$, $p < 0.001$) and manufacturing resilience ($\beta = 0.267$, $p = 0.034$). The FDI-mediated path was not significant ($\beta = 0.096$, $p = 0.355$). The Federal Reserve-rate path was positive ($\beta = 0.659$, $p = 0.002$), while the domestic-rate direct path was negative ($\beta = -0.382$, $p = 0.048$). The supplied bootstrap diagram reports a significant FDI × domestic-rate interaction ($p = 0.025$), although its coefficient is rounded to 0.000 in the algorithm output, indicating a statistically detectable but substantively very small interaction under the reported scaling.

Originality/Value – The study integrates trade-policy reallocation, global monetary conditions, FDI, and manufacturing resilience in one Indonesian framework. It distinguishes the attraction of foreign capital from the domestic capability required to convert that capital into resilient industrial performance.

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1. Introduction

The resurgence of tariff-based trade policy since 2018 has altered the environment in which multinational firms organize production, sourcing, and investment. Evidence from the U.S. tariff increases shows substantial pass-through to import prices, changes in trade volumes, and costly adjustments in supply chains rather than a simple transfer of the tariff burden to foreign exporters (Amiti et al., 2019, 2020; Cavallo et al., 2021; Fajgelbaum et al., 2020). The U.S.–China trade conflict also expanded from a narrow tariff dispute into a broad policy regime affecting more than half of bilateral trade, with consequences that persisted beyond the initial tariff rounds (Bown, 2021). Recent evidence from China further indicates that local exposure to the tariff war was associated with weaker economic activity in more exposed locations (Chor & Li, 2024). For a manufacturing economy integrated into Asian production networks, these developments create both relocation opportunities and new forms of external exposure.

One mechanism through which tariff shocks can reach third countries is the reorganization of global value chains. Import restrictions can induce firms to relocate production or diversify sourcing toward locations that are not directly targeted by the tariff, as illustrated by production relocation following U.S. trade restrictions (Flaaen et al., 2020). At the same time, global value chains rarely respond through complete reshoring; firms more often adapt their networks, change suppliers, or rebalance activities across countries (Gereffi et al., 2021; Zhan, 2021). Research on de-globalization and protectionism similarly shows that policy shocks can reconfigure value chains while creating new vulnerabilities for industries that remain dependent on cross-border inputs and markets (Zahoor et al., 2023). The resilience literature therefore treats supply-chain adjustment as a trade-off between efficiency, redundancy, adaptability, and exposure to systemic shocks (Baldwin & Freeman, 2022; Cohen & Kouvelis, 2021; Ibrahim et al., 2021; Ali et al., 2022). Indonesia's position as both a potential investment destination and an input-output node in Asian manufacturing makes this trade-off empirically important.

Foreign direct investment is central to that adjustment, but higher inflows do not necessarily translate into stronger domestic production capacity. Studies of Indonesian manufacturing show that the productivity consequences of FDI differ across firms, sectors, technological intensity, and regulatory conditions (Genthner & Kis-Katos, 2022; Sugiharti et al., 2022; Suyanto et al., 2021). Foreign participation can facilitate technology, managerial knowledge, and skill upgrading, yet domestic firms may capture these benefits unevenly when absorptive capacity, functional positioning in global value chains, or linkages with multinational firms are limited (Matsuura & Saito, 2023; Pleticha, 2021). This heterogeneity is directly relevant to industrial resilience because resilience requires more than receiving capital; it also depends on the ability of domestic production systems to absorb, retain, and redeploy the capabilities associated with that capital. Consequently, FDI may function as a transmission channel between an external trade-policy shock and domestic manufacturing outcomes without necessarily producing a statistically strong mediated effect.

The trade channel is accompanied by a monetary channel. U.S. monetary policy influences global financial conditions through interest rates, credit supply, asset prices, exchange rates,

and cross-border capital movements (Miranda-Agrippino & Rey, 2020). Firm-level and cross-country evidence indicates that changes in U.S. monetary conditions can alter credit cycles and capital flows in emerging markets, particularly where financing is linked to global banks and U.S.-dollar funding (Bräuning & Ivashina, 2020; Dahlhaus & Vasishtha, 2020). Network-based evidence also shows that U.S. monetary shocks propagate through internationally connected economies rather than stopping at national borders (Dées & Galesi, 2021), while Asian economies display heterogeneous responses to U.S. and Chinese monetary-policy shocks (Beirne et al., 2023). The strength of spillovers further depends on financial integration and domestic interest-rate transmission (Kearns et al., 2023). For Indonesia, this means that the industrial implications of FDI cannot be separated from the global and domestic cost of capital. Existing research provides strong evidence for each of these mechanisms separately, but the literatures remain fragmented. Trade-policy research has documented tariff pass-through, trade contraction, production relocation, and policy uncertainty (Handley & Limão, 2022), while FDI research has examined how uncertainty shapes location decisions and investment flows (Bao et al., 2022). A separate literature considers resilience in global value chains, emphasizing governance, upgrading, digital capability, and cross-firm coordination as conditions for recovery from disruptions (Choksy et al., 2022; Dilyard et al., 2021; Gebhardt et al., 2022). These strands imply that tariff shocks, monetary conditions, and industrial outcomes are connected, yet they are often tested in different empirical settings and at different levels of analysis. The resulting gap is not the absence of evidence on tariffs, FDI, or interest rates individually, but the limited integration of these channels in a single country-level model for an emerging manufacturing economy.

The Indonesian case provides a useful setting for examining this integration because the country combines a large domestic manufacturing base with continuing exposure to foreign investment, regional supply chains, and external monetary conditions. The original analytical framework links U.S. tariff indicators to FDI and manufacturing resilience, introduces FDI as a mediator, and places domestic interest rates in the relationship between investment and manufacturing outcomes. The extended SmartPLS output also contains China-tariff and Federal Reserve-rate pathways, allowing the model to represent a broader external-policy environment than a simple bilateral tariff shock. This structure makes it possible to distinguish a direct association between tariffs and manufacturing from indirect pathways operating through investment and monetary conditions. It also requires careful interpretation because a statistically significant path in an observational macroeconomic model should not be treated as proof of causation.

Accordingly, this study examines how U.S. tariffs, FDI, global interest-rate conditions, and domestic interest rates are associated with Indonesia's manufacturing resilience over 2016–2024. It specifically evaluates whether U.S. tariffs are associated with FDI inflows, whether FDI mediates the tariff–manufacturing relationship, and whether the reported interest-rate structure changes the interpretation of the FDI–manufacturing relationship. The theoretical contribution is to connect structural dependence on external policy conditions with the more specific mechanisms of trade-policy uncertainty, capital reallocation, and domestic absorptive capacity. Empirically, the study provides an integrated PLS-SEM representation of trade,

investment, monetary, and manufacturing indicators for Indonesia. Practically, the analysis clarifies why attracting investment after global trade disruptions may be insufficient unless domestic conditions allow foreign capital to support sustained manufacturing capability.

2. Literature Review & Hypothesis Development

2.1 Trade policy shocks, investment diversion, and FDI

Trade-policy uncertainty changes the expected returns to location-specific and often irreversible investment. When tariffs alter relative market access, multinational firms can respond by delaying investment, redirecting production, or expanding capacity in locations that face lower trade barriers. The broader trade-policy literature shows that uncertainty itself can affect investment decisions even before the full tariff burden is realized (Handley & Limão, 2022), and evidence from China's WTO accession demonstrates that reductions in trade-policy uncertainty were associated with higher FDI inflows in more exposed industries (Bao et al., 2022). The U.S.–China conflict provides a reverse setting in which higher bilateral trade costs create incentives to reconsider production geography (Bown, 2021; Gereffi et al., 2021). In this study, Indonesia is treated as a potential alternative location within that reallocation process. This logic supports the first hypothesis: H1, U.S. tariffs are associated with FDI to Indonesia.

2.2 FDI and manufacturing resilience

FDI can support manufacturing through capital formation, technology transfer, managerial practices, access to international markets, and linkages with domestic suppliers. However, these benefits are conditional rather than automatic. Indonesian firm-level studies find that FDI-related productivity gains vary across industry clusters and technological intensity, indicating that domestic absorptive capacity shapes the extent to which foreign presence improves firm performance (Sugiharti et al., 2022; Suyanto et al., 2021). Regulatory restrictions on foreign investment can also reduce firm productivity, suggesting that the composition and quality of capital matter for industrial outcomes (Genthner & Kis-Katos, 2022). From a resilience perspective, an FDI inflow generated by external tariff diversion may therefore strengthen manufacturing only when foreign capital becomes embedded in domestic production capabilities. This leads to H2: FDI mediates the association between U.S. tariffs and Indonesia's manufacturing resilience.

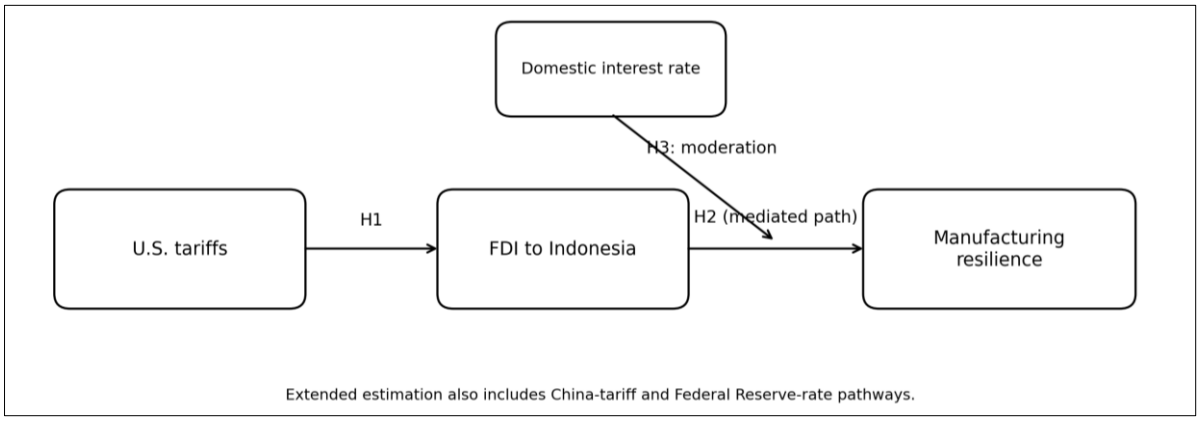
2.3 Global and domestic interest-rate transmission

Global interest-rate conditions influence emerging economies through the cost and availability of external finance, exchange-rate movements, portfolio allocation, and bank lending. U.S. monetary policy has been shown to contribute to a global financial cycle and to affect credit conditions faced by emerging-market firms (Bräuning & Ivashina, 2020; Miranda-Agrippino & Rey, 2020). The effects are heterogeneous across countries, reflecting differences in financial integration, domestic policy settings, and exposure to cross-border balance sheets (Beirne et al., 2023; Dées & Galesi, 2021). Domestic interest rates can simultaneously alter the local financing environment faced by firms receiving or complementing FDI. A moderation argument therefore requires an explicit interaction between FDI and the domestic interest rate rather than inference from the moderator's direct effect alone. Accordingly, H3 states that

domestic interest rates moderate the association between FDI and Indonesia's manufacturing resilience.

2.4 Analytical framework

The three focal hypotheses are embedded in a broader structural model that also contains China-tariff and Federal Reserve-rate pathways. These additional paths represent retaliatory trade measures and global monetary transmission, while H1–H3 remain the principal tests. Figure 1 summarizes the focal conceptual relationships. H1 proposes that U.S. tariffs are associated with FDI to Indonesia. H2 proposes that FDI mediates the U.S.-tariff–manufacturing relationship. H3 proposes that the domestic interest rate moderates the FDI–manufacturing relationship through an explicit interaction term.



Source: Authors' conceptualization based on the study hypotheses.

Figure 1. Focal conceptual framework

3. Methodology

3.1 Research design and data scope

The study used a quantitative explanatory design based on a compiled secondary-data matrix covering observations reported between 2016 and 2024. The final analytical matrix contained 64 aligned records. The archival material does not preserve a documented regular monthly or quarterly frequency, so the records are treated as indexed secondary observations rather than as a complete regular time series. This distinction is important because the analysis estimates structural associations among tariffs, FDI, interest-rate conditions, and manufacturing resilience; it does not estimate lagged time-series causality. The unit of analysis is therefore the synchronized record in the supplied secondary-data matrix.

3.2 Data sources, variables, and data preparation

The source manuscript identifies Bank Indonesia (2021, 2022), the Indonesia Investment Coordinating Board (BKPM, 2025), the World Bank (2022), the International Monetary Fund, and UNCTAD (2023) as providers of macroeconomic and investment information. The analytical matrix contains China Tariff to the United States (CTU), China Tariff to the World (CTW), U.S. Tariff to China (UTC), U.S. Tariff to the World (UTW), total FDI to Indonesia (FDIT), FDI from China (FCN), FDI from the United States (FUS), the Federal Reserve interest-rate indicator (IFE), the Bank Indonesia interest-rate indicator (IBI), and manufacturing-

productivity/output indicators. Variables were retained under the same coding used in the supplied model and transformed using natural logarithms as reported in the original study. Because the precise provider of the tariff series is not identified in the archived manuscript, no new source is assigned to those indicators here.

3.3 Measurement assessment

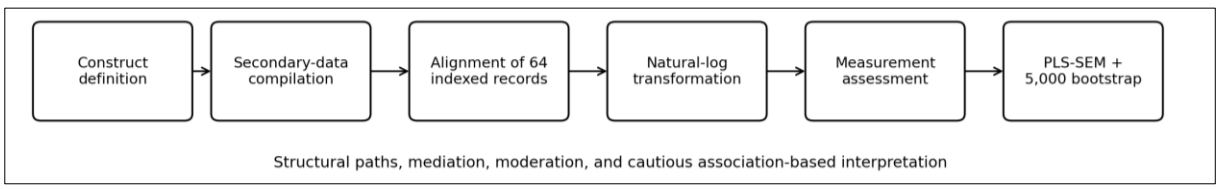
Measurement quality was reassessed from the standardized outer loadings visible in the supplied SmartPLS algorithm output. Multi-indicator constructs were evaluated using indicator loadings, composite reliability (CR), and average variance extracted (AVE), consistent with PLS-SEM reporting guidance (Hair et al., 2019). CR and AVE were calculated directly from the reported standardized loadings using $CR = (\Sigma\lambda)^2/[(\Sigma\lambda)^2 + \Sigma(1-\lambda^2)]$ and $AVE = \Sigma\lambda^2/n$. Cronbach's alpha, rho_A, and HTMT values were not recoverable from the archived output and are therefore not fabricated or reported. IFE and IBI are single-indicator constructs; their fixed loading of 1.000 is a specification property rather than evidence of perfect measurement quality.

3.4 PLS-SEM estimation, mediation, moderation, and analytical scope

SmartPLS was used to estimate the measurement and structural models with 5,000 bootstrap resamples. Direct paths were evaluated using the reported standardized coefficients, t statistics, and p values, while mediation was assessed from the specific indirect effect of U.S. tariffs through FDI to manufacturing resilience. Moderation was evaluated from the explicit FDI × domestic interest-rate interaction shown in the supplied SmartPLS outputs. The bootstrap diagram reports $p = 0.025$ for the interaction path, while the algorithm diagram displays the interaction coefficient as 0.000 after three-decimal rounding. The moderation result is therefore treated as statistically detectable but substantively very small under the reported scaling, and no claim about a large strengthening or weakening effect is made. PLS-SEM was used as an integrated structural-association model rather than as a substitute for dynamic time-series econometrics; because the observation frequency is not documented, stationarity, lag selection, and autocorrelation tests are not reconstructed from unavailable raw series. Accordingly, all structural estimates are interpreted as associations within the specified model rather than as causal effects.

3.5 Research procedure

The analytical sequence consisted of construct definition, secondary-data compilation, alignment of the 64 indexed records, natural-log transformation, measurement assessment, PLS-SEM estimation, bootstrapping, and interpretation against the theoretical framework and international literature. Figure 2 summarizes this procedure.



Source: Authors' procedure based on the reported analytical workflow.

Figure 2. Research procedure

4. Result and Discussion

4.1 Descriptive and measurement-model results

The analytical matrix contained 64 observations for each reported indicator. To avoid an unnecessarily wide descriptive table, Table 1 summarizes the principal tariff, monetary, FDI, and aggregate manufacturing indicators used in the structural interpretation. The statistics are reproduced from the source manuscript without changing the underlying values.

Table 1. Descriptive statistics for key observed indicators

Indicator	N	Minimum	Maximum	Mean	SD
UTC	64	1.13	4.90	2.7192	0.90365
UTW	64	0.79	2.75	1.1466	0.36570
IBI	64	1.25	1.83	1.5417	0.23574
IFE	64	-3.00	1.67	-0.1567	1.92525
FDIT	64	5.29	6.14	5.6052	0.27194
FUS	64	1.59	3.22	2.6523	0.56136
FCN	64	2.30	4.01	3.4191	0.62818
MTT	64	4.64	5.15	4.9980	0.09255

Source: Authors' estimation from the supplied analytical matrix.

The measurement model shows high standardized loadings for both tariff constructs and the FDI construct. For manufacturing resilience, the retained indicators range from 0.704 to 0.968. Table 2 reports CR and AVE calculated from the loadings visible in the supplied SmartPLS output. All four multi-indicator constructs exceed conventional CR and AVE benchmarks, supporting convergent reliability within the reported measurement specification. This conclusion is limited to convergent measurement quality because a recoverable HTMT matrix was not available.

Table 2. Measurement-model assessment

Construct	Reported loading(s)	CR	AVE
China tariffs	CTU .939; CTW .937	0.936	0.880
U.S. tariffs	UTC .961; UTW .895	0.926	0.862
FDI to Indonesia	FCN .987; FDIT .942; FUS .961	0.975	0.928
Manufacturing resilience	MM1 .847; MM15 .923; MM16 .704; MM18 .889; MM19 .940; MM20 .840; MM21 .849; MM3 .766; MM8 .864; MTT .968	0.966	0.744
Federal Reserve rate	IFE 1.000	n.a.	n.a.
Domestic interest rate	IBI 1.000	n.a.	n.a.

Source: Authors' calculations from reported SmartPLS outer loadings. CR and AVE are not calculated for single-indicator constructs.

The structural model shows substantial in-sample explained variance for FDI and manufacturing resilience. However, R^2 and adjusted R^2 are interpreted as explanatory statistics within the estimated model and not as evidence of out-of-sample predictive validity. The model-fit diagnostics are also treated descriptively because bootstrap reference values for discrepancy measures were not available.

Table 3. Coefficient of determination

Endogenous construct	R^2	Adjusted R^2
China tariffs	0.733	0.729
FDI to Indonesia	0.783	0.776
Federal Reserve interest rate	0.652	0.631
Indonesia manufacturing	0.814	0.795
Domestic interest rate	0.815	0.803

Source: Authors' estimation.

Table 4. Model-fit diagnostics

Statistic	Saturated model	Estimated model
SRMR	0.011	0.036
d_ULS	23.29	24.578
d_G	5.97	5.37
Chi-square	340.243	259.242
NFI	0.9161	0.94

Source: Authors' estimation using PLS-SEM. Values are reported descriptively.

4.2 Structural-model results

Table 5 reports the focal and theoretically relevant paths used in the revised interpretation. Two non-focal extended paths from the source table contained internally inconsistent t-statistic/p-value combinations and are not used for hypothesis decisions in this article. This avoids changing uncertain values while ensuring that the substantive conclusions rely only on internally coherent estimates or directly visible SmartPLS output.

Table 5. Focal structural paths, mediation, and moderation

Path	β	t	p	Decision
H1: U.S. tariffs → FDI	0.534	3.605	<0.001	Supported
U.S. tariffs → manufacturing	0.267	2.126	0.034	Significant
FDI → manufacturing	0.339	1.266	0.206	Not significant
H2: U.S. tariffs → FDI → manufacturing	0.096	0.927	0.355	Not supported
Federal Reserve rate → manufacturing	0.659	3.052	0.002	Significant
Domestic interest rate → manufacturing	-0.382	1.984	0.048	Significant
H3: FDI × domestic rate → manufacturing	0.000 (rounded)	n.r.	0.025	Supported; reported interaction is very small

Source: Authors' synthesis of the supplied SmartPLS table and figures. Note: the interaction coefficient is displayed as 0.000 after three-decimal rounding in the algorithm figure; p = 0.025 is shown on the interaction path in the bootstrap diagram; n.r. = not separately reported.

The results support H1 because U.S. tariffs were positively associated with FDI to Indonesia (β = 0.534, p < 0.001). The direct tariff-to-manufacturing path was also positive (β = 0.267, p = 0.034), while the direct FDI-to-manufacturing path was not significant (β = 0.339, p = 0.206). H2 was therefore not supported: the specific indirect effect from U.S. tariffs through FDI to manufacturing resilience was β = 0.096 (p = 0.355). The Federal Reserve-rate path to manufacturing was positive (β = 0.659, p = 0.002), whereas the domestic-rate direct path was negative (β = -0.382, p = 0.048). For H3, the supplied bootstrap diagram reports p = 0.025 for the FDI × domestic-rate interaction. Because the corresponding coefficient is rounded to 0.000 in the algorithm output, the interaction is statistically detectable in the supplied output but should be interpreted as very small in substantive terms.

4.3 Discussion

The strongest trade-related result is the positive association between U.S. tariffs and FDI to Indonesia (β = 0.534, p < 0.001). Within the model, this pattern is consistent with an investment-diversion mechanism in which higher trade barriers between large economies change the relative attractiveness of alternative production locations. Evidence from prior tariff episodes shows that firms can relocate production or reorganize supply chains when bilateral barriers rise (Flaaen et al., 2020), while research on the U.S.–China conflict documents persistent changes in trade-policy conditions (Bown, 2021). The result also aligns with the broader argument that global value chains adapt to trade restrictions through reconfiguration rather

than through a uniform retreat from international production (Gereffi et al., 2020; Zhan, 2021). For Indonesia, the implication is not that tariffs are inherently beneficial, but that trade conflict elsewhere may alter the geography of investment in ways that create opportunities for countries positioned as alternative manufacturing locations.

The positive direct association between U.S. tariffs and manufacturing resilience ($\beta = 0.267$, $p = 0.034$) requires a more cautious interpretation. Tariff-induced reallocation can increase demand for alternative production bases, but the same protectionist environment can raise input costs, disrupt supplier networks, and increase uncertainty. Research on global supply-chain risk emphasizes that exposure is often indirect and can be amplified through network dependence (Baldwin & Freeman, 2022), while studies of protectionism show that industries embedded in global value chains can face substantial adjustment costs (Zahoor et al., 2023). The observed positive path may therefore reflect Indonesia's position in a reallocation process rather than a general claim that external tariffs strengthen domestic industry. The coefficient is best interpreted as a conditional association during the study period rather than as evidence of a universal causal effect.

The non-significant FDI-mediated pathway is theoretically informative because it separates the arrival of foreign capital from the realization of domestic industrial benefits. U.S. tariffs were associated with higher FDI, yet the indirect path through FDI to manufacturing resilience was not significant ($\beta = 0.096$, $p = 0.355$). Indonesian firm-level research offers a plausible explanation: FDI spillovers vary according to technological intensity, firm heterogeneity, and the capacity of domestic firms to absorb knowledge and participate in foreign-linked production networks (Sugiharti et al., 2022; Suyanto et al., 2021). Matsuura and Saito (2023) similarly show that foreign investment can reshape skill demand and competition rather than produce uniform benefits across local firms. The present result therefore supports a conditional view of FDI in which investment inflows may provide resources for upgrading but are not sufficient evidence of industrial resilience.

The Federal Reserve interest-rate construct was strongly associated with manufacturing resilience ($\beta = 0.659$, $p = 0.002$), indicating that external monetary conditions are materially connected to the domestic manufacturing system within the estimated model. International evidence shows that U.S. monetary policy drives part of the global financial cycle and affects emerging-market credit conditions, asset prices, and cross-border financing (Bräuning & Ivashina, 2020; Miranda-Agrippino & Rey, 2020). Network-based studies further show that spillovers are amplified by international financial linkages (Dées & Galesi, 2021), and Asian economies respond differently according to their exposure and domestic structure (Beirne et al., 2023). The positive coefficient should not be read mechanically as evidence that higher Federal Reserve rates improve Indonesian manufacturing, because the direction can depend on coding, transformation, and timing. The defensible conclusion is that global monetary conditions are strongly associated with the manufacturing construct in the reported model.

Domestic interest rates provide a second monetary channel. Their direct path to manufacturing resilience is negative ($\beta = -0.382$, $p = 0.048$), which is consistent with the expectation that tighter local financing conditions can constrain capital-intensive activity and

reduce the ability of domestic firms to complement foreign investment. The moderation hypothesis is now evaluated separately from this direct effect. The interaction path shown in the supplied SmartPLS bootstrap output has p = 0.025, while the algorithm output rounds its coefficient to 0.000. This combination suggests a statistically detectable interaction under the model's scaling but a very small substantive effect. H3 can therefore be retained as statistically supported in the supplied output, but claims that domestic rates strongly weaken or strengthen the FDI effect would exceed the available coefficient information.

The pattern of non-significant multi-step effects also indicates that the transmission of global shocks is not well represented as a single deterministic chain. Resilience research emphasizes that firms and value chains adapt through governance, upgrading, collaboration, and digital capability (Choksy et al., 2022; Dilyard et al., 2021; Gebhardt et al., 2022). Macro-level investment and interest-rate indicators can capture only part of that adjustment process. The weak mediation result may therefore indicate omitted organizational and institutional channels rather than the absence of transmission altogether. This interpretation is consistent with the study's structural-dependency framing: external conditions matter, but their domestic consequences depend on the configuration of local capabilities and policy responses.

The findings refine the paper's theoretical position in two ways. First, they qualify a simple dependency argument by showing that external shocks are not transmitted uniformly: the tariff–FDI path is strong, whereas the FDI-mediated manufacturing path is weak. Second, they connect trade-policy uncertainty with industrial resilience through the distinction between capital relocation and capability formation. The literature on trade-policy uncertainty shows that changing policy regimes alter investment incentives (Bao et al., 2022; Handley & Limão, 2022), while global-value-chain research shows that resilience depends on how firms and production networks reorganize after disruption (Gereffi et al., 2021). The conceptual contribution is therefore not that FDI is inherently positive or negative, but that its industrial value depends on whether external capital becomes embedded in a resilient domestic production system.

The policy implication follows from this distinction. Indonesia may benefit from investment reallocation generated by global trade tensions, but policies that maximize the volume of FDI alone are unlikely to guarantee stronger manufacturing resilience. A complementary strategy is needed to improve technology absorption, domestic supplier linkages, workforce capability, and the financing environment for productive investment. Indonesian evidence shows that productivity effects are heterogeneous across firms and sectors (Genthner & Kis-Katos, 2022; Sugiharti et al., 2022), so investment policy should be evaluated by the quality of linkages and capability development as well as by headline inflow values. Monetary policy must simultaneously balance domestic stabilization with the financing conditions faced by manufacturing firms. These implications remain association-based and should not be interpreted as causal prescriptions from a regular time-series experiment.

5. Conclusion and Suggestion

This study integrates U.S. tariffs, FDI, Federal Reserve interest-rate conditions, domestic interest rates, and Indonesia's manufacturing resilience in a single PLS-SEM framework. U.S.

tariffs were positively associated with FDI to Indonesia ($\beta = 0.534$, $p < 0.001$) and with manufacturing resilience ($\beta = 0.267$, $p = 0.034$). FDI did not significantly mediate the tariff–manufacturing relationship ($\beta = 0.096$, $p = 0.355$), showing that increased inflows were not sufficient to explain stronger manufacturing resilience through the tested indirect pathway. The Federal Reserve-rate construct was significantly associated with manufacturing resilience ($\beta = 0.659$, $p = 0.002$), while the domestic-rate direct path was negative ($\beta = -0.382$, $p = 0.048$). The supplied SmartPLS bootstrap output also reports a significant FDI × domestic-rate interaction ($p = 0.025$), although its coefficient is rounded to 0.000, so the moderation effect should be regarded as substantively small under the reported scaling.

The central implication is the distinction between attracting foreign capital and converting that capital into resilient domestic production capability. Investment-promotion policy should therefore be accompanied by measures that improve technological absorption, domestic supplier linkages, workforce capability, and stable access to productive finance. The study does not establish that tariff or interest-rate changes cause manufacturing resilience; instead, it identifies structured associations within the supplied observational dataset. Future policy evaluation should therefore combine investment-flow indicators with direct evidence on productivity, technology transfer, domestic value added, and supply-chain upgrading.

6. Limitations and Future Research

Several limitations remain important for interpretation. First, the analytical matrix contains 64 aligned records covering source observations from 2016–2024, but the archived manuscript does not specify a regular temporal frequency, synchronization rule, or missing-data protocol. The revised analysis therefore treats the records as indexed observations and avoids dynamic time-series claims. Second, because the raw chronological series are unavailable, stationarity, autocorrelation, structural-break, and lag-sensitivity tests cannot be reconstructed; future studies should use a documented monthly, quarterly, or panel structure and compare PLS-SEM with time-series or panel estimators. Third, CR and AVE can be derived from the reported outer loadings, but Cronbach's alpha, rho_A, and HTMT cannot be recovered from the archived output and should be reported in future replications. Fourth, the exact source and coding of the tariff series should be documented from the original raw dataset. Fifth, the moderation coefficient is rounded to 0.000 in the algorithm figure despite a bootstrap p value of 0.025; future reporting should export the full-precision interaction coefficient, confidence interval, and effect-size measure. These extensions would improve reproducibility and clarify the temporal and substantive magnitude of the reported relationships.

Declaration of AI and AI-assisted technologies in the writing process

During the preparation of this manuscript, the authors used OpenAI ChatGPT for language editing, structural organization, formatting assistance, and consistency checking. The authors reviewed and edited the content as needed and take full responsibility for the final content of the publication.

References

Ali, I., Arslan, A., Chowdhury, M., Khan, Z., & Tarba, S. Y. (2022). Reimagining global food value chains through effective resilience to COVID-19 shocks and similar future events: A dynamic capability perspective. *Journal of Business Research, 141*, 1–12. https://doi.org/10.1016/j.jbusres.2021.12.006

Amiti, M., Redding, S. J., & Weinstein, D. E. (2019). The impact of the 2018 tariffs on prices and welfare. *Journal of Economic Perspectives, 33*(4), 187–210. https://doi.org/10.1257/jep.33.4.187

Amiti, M., Redding, S. J., & Weinstein, D. E. (2020). Who's paying for the U.S. tariffs? A longer-term perspective. *AEA Papers and Proceedings, 110*, 541–546. https://doi.org/10.1257/pandp.20201018

Badan Koordinasi Penanaman Modal. (2025). *Capaian realisasi investasi triwulan I (Januari–Maret) tahun 2025*. Kementerian Investasi dan Hilirisasi/BKPM.

Baldwin, R., & Freeman, R. (2022). Risks and global supply chains: What we know and what we need to know. *Annual Review of Economics, 14*, 153–180. https://doi.org/10.1146/annurev-economics-051420-113737

Bank Indonesia. (2021). *Laporan bulanan ekonomi dan keuangan*.

Bank Indonesia. (2022). *Monetary policy report Q4 2022*.

Bao, X., Deng, J., Sun, H., & Sun, J. (2022). Trade policy uncertainty and foreign direct investment: Evidence from China's WTO accession. *Journal of International Money and Finance, 125*, 102642. https://doi.org/10.1016/j.jimonfin.2022.102642

Beirne, J., Renzhi, N., & Volz, U. (2023). When the United States and the People's Republic of China sneeze: Monetary policy spillovers to Asian economies. *Open Economies Review, 34*, 519–540. https://doi.org/10.1007/s11079-022-09695-1

Bown, C. P. (2021). The U.S.–China trade war and Phase One agreement. *Journal of Policy Modeling, 43*(4), 805–843. https://doi.org/10.1016/j.jpolmod.2021.02.009

Bräuning, F., & Ivashina, V. (2020). U.S. monetary policy and emerging market credit cycles. *Journal of Monetary Economics, 112*, 57–76. https://doi.org/10.1016/j.jmoneco.2019.02.005

Cavallo, A., Gopinath, G., Neiman, B., & Tang, J. (2021). Tariff pass-through at the border and at the store: Evidence from U.S. trade policy. *American Economic Review: Insights, 3*(1), 19–34. https://doi.org/10.1257/aeri.20190536

Choksy, U. S., Ayaz, M., Al-Tabbaa, O., & Parast, M. (2022). Supplier resilience under the COVID-19 crisis in apparel global value chain (GVC): The role of GVC governance and supplier's upgrading. *Journal of Business Research, 150*, 249–267. https://doi.org/10.1016/j.jbusres.2022.05.068

Chor, D., & Li, B. (2024). Illuminating the effects of the U.S.–China tariff war on China's economy. *Journal of International Economics, 150*, 103926. https://doi.org/10.1016/j.jinteco.2024.103926

Cohen, M. A., & Kouvelis, P. (2021). Revisit of AAA excellence of global value chains: Robustness, resilience, and realignment. *Production and Operations Management, 30*(3), 633–643. https://doi.org/10.1111/poms.13305

Dahlhaus, T., & Vasishtha, G. (2020). Monetary policy news in the U.S.: Effects on emerging market capital flows. *Journal of International Money and Finance, 109*, 102251. https://doi.org/10.1016/j.jimonfin.2020.102251

Dées, S., & Galesi, A. (2021). The global financial cycle and U.S. monetary policy in an interconnected world. *Journal of International Money and Finance, 115*, 102395. https://doi.org/10.1016/j.jimonfin.2021.102395

Dilyard, J., Zhao, S., & You, J. J. (2021). Digital innovation and Industry 4.0 for global value chain resilience: Lessons learned and ways forward. *Thunderbird International Business Review, 63*(5), 577–584. https://doi.org/10.1002/tie.22229

Fajgelbaum, P. D., Goldberg, P. K., Kennedy, P. J., & Khandelwal, A. K. (2020). The return to protectionism. *The Quarterly Journal of Economics, 135*(1), 1–55. https://doi.org/10.1093/qje/qjz036

Flaaen, A., Hortaçsu, A., & Tintelnot, F. (2020). The production relocation and price effects of U.S. trade policy: The case of washing machines. *American Economic Review, 110*(7), 2103–2127. https://doi.org/10.1257/aer.20190611

Gebhardt, M., Spieske, A., Kopyto, M., & Birkel, H. (2022). Increasing global supply chains' resilience after the COVID-19 pandemic: Empirical results from a Delphi study. *Journal of Business Research, 150*, 59–72. https://doi.org/10.1016/j.jbusres.2022.06.008

Genthner, R., & Kis-Katos, K. (2022). Foreign investment regulation and firm productivity: Granular evidence from Indonesia. *Journal of Comparative Economics, 50*(3), 668–687. https://doi.org/10.1016/j.jce.2022.02.003

Gereffi, G. (2020). What does the COVID-19 pandemic teach us about global value chains? The case of medical supplies. *Journal of International Business Policy, 3*, 287–301. https://doi.org/10.1057/s42214-020-00062-w

Gereffi, G., Lim, H.-C., & Lee, J. (2021). Trade policies, firm strategies, and adaptive reconfigurations of global value chains. *Journal of International Business Policy, 4*, 506–522. https://doi.org/10.1057/s42214-021-00102-z

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Handley, K., & Limão, N. (2022). Trade policy uncertainty. *Annual Review of Economics, 14*, 363–395. https://doi.org/10.1146/annurev-economics-021622-020416

Ibrahim, S. E., Centeno, M. A., Patterson, T. S., & Callahan, P. W. (2021). Resilience in global value chains: A systemic risk approach. *Global Perspectives, 2*(1), 27658. https://doi.org/10.1525/gp.2021.27658

Kearns, J., Schrimpf, A., & Xia, F. D. (2023). Explaining monetary spillovers: The matrix reloaded. *Journal of Money, Credit and Banking, 55*(6), 1535–1568. https://doi.org/10.1111/jmcb.12996

Matsuura, T., & Saito, H. (2023). Foreign direct investment and labor demand by skill in Indonesian manufacturing firms. *Review of World Economics, 159*, 921–941. https://doi.org/10.1007/s10290-022-00485-y

Miranda-Agrippino, S., & Rey, H. (2020). U.S. monetary policy and the global financial cycle. *The Review of Economic Studies, 87*(6), 2754–2776. https://doi.org/10.1093/restud/rdaa019

Pleticha, P. (2021). Who benefits from global value chain participation? Does functional specialization matter? *Structural Change and Economic Dynamics, 58*, 291–299. https://doi.org/10.1016/j.strueco.2021.06.005

Sugiharti, L., Yasin, M. Z., Purwono, R., Esquivias, M. A., & Pane, D. (2022). The FDI spillover effect on the efficiency and productivity of manufacturing firms: Its implication on open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(2), 99. https://doi.org/10.3390/joitmc8020099

Suyanto, S., Sugiarti, Y., & Setyaningrum, I. (2021). Clustering and firm productivity spillovers in Indonesian manufacturing. *Heliyon*, *7*(3), e06504. https://doi.org/10.1016/j.heliyon.2021.e06504

United Nations Conference on Trade and Development. (2023). *World investment report 2023*. United Nations.

World Bank. (2022). *Indonesia economic prospects: Navigating global headwinds*.

Zahoor, N., Wu, J., Khan, H., & Khan, Z. (2023). De-globalization, international trade protectionism, and the reconfigurations of global value chains. *Management International Review*, *63*, 823–859. https://doi.org/10.1007/s11575-023-00522-4

Zhan, J. X. (2021). GVC transformation and a new investment landscape in the 2020s: Driving forces, directions, and a forward-looking research and policy agenda. *Journal of International Business Policy*, *4*, 206–220. https://doi.org/10.1057/s42214-020-00088-0