

Trade Creation and Diversion in Overlapping ASEAN+6 Agreements

Gandri Narandu¹, Agus Sriyanto^{2*}

¹School of International and Public Policy, Hitotsubashi University, Japan

¹Ministry of Finance Indonesia, Indonesia

²Customs and Excise Department of Politeknik Keuangan Negara STAN, Indonesia

E-mail: ¹gandri.narandu@gmail.com; ²agus.sriyanto@pknstan.ac.id

*Corresponding Author

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Abstract

Research Originality: This study provides a unified, directly comparable evaluation of six overlapping ASEAN+6 trade agreements within a single structural gravity framework, thereby overcoming the fragmentation of earlier studies that typically focused on individual agreements, specific commodities, or highly aggregated trade flows.

Research Objectives: This study examines whether overlapping trade agreements are associated with trade creation and trade diversion at the regional level and in Indonesia's bilateral trade across aggregate and sectoral dimensions.

Research Methods: Using panel data for 1993–2020, the study applies a structural gravity model estimated with Poisson pseudo-maximum likelihood and fixed effects to address zero trade flows, heteroskedasticity, and unobserved bilateral heterogeneity.

Empirical Results: Trade effects differ substantially across agreements. At the regional level, ACFTA and AKFTA exhibit the strongest intra-bloc trade creation, whereas AIFTA, AANZFTA, and AJCEP produce weaker or negative effects. For Indonesia, AKFTA is associated with the most consistent positive export and import performance, while sectoral gains are more concentrated in manufacturing than in primary products.

Implications: Overlapping trade agreements should be treated as differentiated policy instruments. Their benefits depend on industrial capability, effective utilization of preferences, harmonized rules of origin, and lower non-tariff barriers.

Keywords:

trade diversion; preferential trade liberalization; structural gravity model; sectoral heterogeneity; manufacturing trade

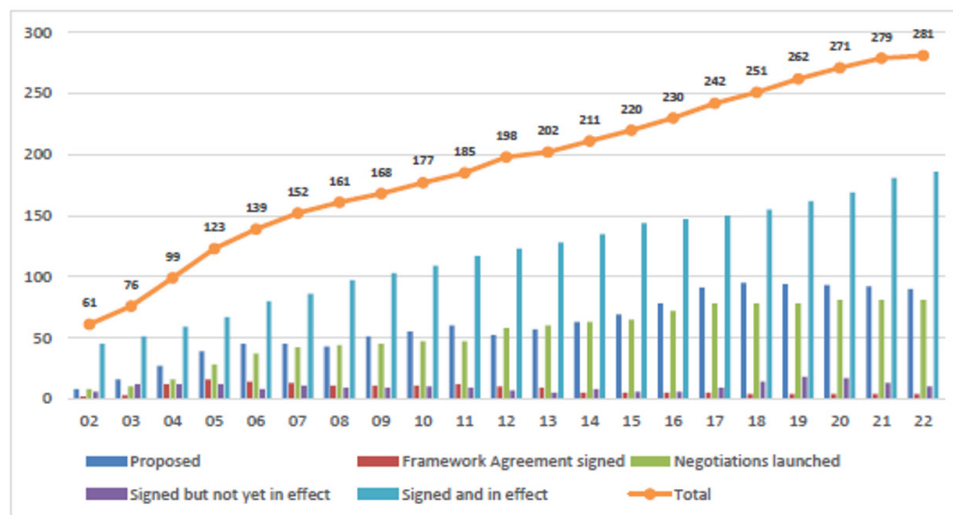
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INTRODUCTION

Regional trade agreements have become a defining feature of the contemporary trading system, particularly in the Asia–Pacific region, where the number of concluded and implemented agreements has increased markedly over the past three decades (Asian Development Bank, 2022; World Trade Organization, 2026). Since the establishment of the World Trade Organization in 1995, notified regional trade agreements have expanded sharply, reflecting a broader shift from multilateral bargaining toward bilateral and regional preferential arrangements (Bijovsky, 2023). As shown in Figure 1, this expansion has been both cumulative and layered: the total number of FTAs has risen steadily over time, while the composition of agreements has become more complex, including those proposed, under negotiation, framework-based, signed but not yet in force, and fully implemented. The figure therefore illustrates that the contemporary trade regime is shaped not only by agreements already in force, but also by a continuing pipeline of institutional arrangements that deepen and diversify regional economic integration. Within this evolving landscape, ASEAN occupies a central institutional position because it combines internal liberalization under the ASEAN Free Trade Area with a series of ASEAN+1 agreements involving China, Japan, the Republic of Korea, India, and Australia–New Zealand. Commonly described as the ASEAN+6 framework, this overlapping architecture is associated with denser production networks and stronger regional interdependence, especially among economies linked through value chains and intermediate-goods trade (Chen & De Lombaerde, 2019). The central issue is whether overlapping ASEAN+6 agreements generate broad-based trade gains or instead produce uneven and sector-specific patterns of trade creation and diversion.

Figure 1. Cumulative Growth and Status Composition of Free Trade Agreements



Source: Asian Development Bank (2022), *FTA by Status (Cumulative)*.

The contemporary landscape of regional trade agreements is characterized not only by numerical proliferation but also by increasing institutional depth. Modern preferential

agreements extend far beyond traditional tariff reduction to encompass services liberalization, investment disciplines, intellectual property rights, competition policy, labor standards, and environmental provisions. This evolution toward deep integration reflects both economic imperatives and political economy considerations. On the one hand, the expansion of global value chains requires greater regulatory coordination across borders. On the other hand, governments use trade agreements to lock in domestic reforms, enhance policy credibility, and signal commitment to investors (Adam et al., 2023; Chakraborty et al., 2024). Xi (2026), for instance, shows that deep trade agreements can significantly increase bilateral services trade, indicating that the impact of contemporary RTAs extends well beyond merchandise trade alone. The growing depth of these agreements makes regional integration more complex, especially when multiple agreements overlap within the same geographic and institutional space.

Indonesia provides a particularly relevant case for examining these dynamics because its participation in regional FTAs is closely linked to export competitiveness, production-network integration, and structural transformation. Existing studies suggest that ASEAN+1 agreements have reshaped Indonesia's trade relations with China and the Republic of Korea, particularly through manufacturing linkages, the use of firm-level preferences, and cross-border production arrangements (Bustaman et al., 2022). At the same time, persistent concerns remain regarding import pressure, uneven export responses, and limited firm-level utilization of preferential arrangements, especially among micro, small, and medium-sized enterprises (Hayakawa et al., 2017; International Monetary Fund, Asia and Pacific Department, 2024). These mixed outcomes suggest that the effects of regional integration cannot be inferred solely from formal market-opening provisions. Rather, the realized trade effects of FTAs depend on how preferential access interacts with domestic industrial capability, firm readiness, and the wider institutional environment in which firms operate.

From a theoretical perspective, preferential liberalization reallocates trade between member and non-member economies through two principal mechanisms: trade creation and trade diversion. Trade creation occurs when tariff preferences shift demand toward more efficient intra-bloc producers. In contrast, trade diversion occurs when imports are redirected away from more efficient external suppliers due to preferential margins. The classical distinction remains central because the net welfare effect of any regional trade arrangement still depends on the balance between these two forces (Kurbanbaevna, 2022; Nguyen et al., 2025). Subsequent developments in international trade theory further suggest that these effects are unlikely to be uniform because firm heterogeneity, increasing returns, spatial production decisions, and the fragmentation of production across borders generate asymmetric adjustments across sectors and locations. In this sense, the core question is no longer simply whether FTAs increase trade, but how, for whom, and under what institutional conditions those trade gains are realized.

This complexity becomes even more pronounced in the presence of overlapping regionalism. Bhagwati's well-known "spaghetti bowl" metaphor captures the institutional frictions that arise when countries participate in multiple preferential agreements with

different tariff commitments, regulatory provisions, and rules of origin (Bijovsky, 2023). In principle, overlapping agreements may create multiple channels of market access and reinforce regional trade expansion. In practice, however, they may also increase compliance costs, distort sourcing decisions, and generate diversionary pressures when firms reorganize production to satisfy preferential criteria rather than economic efficiency. Chakraborty et al. (2024) emphasize that multiple RTA membership can complicate the administration of free trade agreements and amplify trade diversion effects, particularly through restrictive rules of origin. Likewise, Abreha et al. (2023) show that the trade effects of RTAs vary considerably across sectors and are negatively associated with the restrictiveness of rules of origin, especially in fragmented industries such as apparel. These findings suggest that the proliferation of overlapping agreements may create a more differentiated and sometimes less efficient structure of liberalization than aggregate counts of FTAs would imply.

Consistent with this view, gravity-based empirical studies show that FTA effects vary substantially across agreements, countries, and sectors. Nevertheless, much of the existing evidence remains fragmented because it focuses either on single agreements or on highly aggregated trade flows, thereby limiting cross-agreement comparability across overlapping arrangements (Jagdambe & Kannan, 2020; Qu & Zhang, 2023). A further challenge concerns empirical design. Many earlier gravity studies relied on log-linear ordinary least squares despite well-known problems related to heteroskedasticity and zero trade flows (Santos Silva & Teneyro, 2006). More recent work has increasingly adopted structural gravity models estimated using Poisson pseudo-maximum likelihood, which are better suited to handling zero-valued trade flows, more robust to heteroskedasticity, and less vulnerable to sample-selection bias in multi-country panel settings (Kabir et al., 2017; Baier et al., 2019). Even so, directly comparable evidence on the full ASEAN+6 architecture remains scarce, especially when the objective is to identify heterogeneous effects across both agreements and sectors within a single empirical framework.

Recent studies have begun to address the intersection of overlapping FTAs, PPML methodology, and sectoral heterogeneity in the ASEAN and Indonesian context. Handoyo et al. (2021), for example, evaluate the ASEAN Plus Six free trade area simultaneously using a PPML gravity model and document markedly asymmetric trade-creation and trade-diversion effects across member economies. Their findings suggest that the gains from regional integration are unevenly distributed, with stronger benefits often concentrated in primary and natural resource-based commodities. In contrast, manufactured products face more complex substitution effects. This sectoral heterogeneity is reinforced by Purwono et al. (2022), who show that under overlapping regional liberalization, Indonesia experiences stronger trade expansion in natural resource-intensive sectors but faces greater competitive pressure and trade diversion in higher-technology manufacturing. By combining disaggregated product analysis with GMM and PPML estimation, they demonstrate that the gains from ASEAN+6 integration are conditioned by pre-existing comparative advantages rather than generating uniform benefits across industries.

More granular evidence suggests that these asymmetries persist even within narrowly defined agricultural and agro-industrial sectors. Akhmadi and Lee (2024), for instance,

apply a PPML gravity model to ASEAN+5 trade arrangements as an institutional precursor to the Regional Comprehensive Economic Partnership and find that overlapping FTAs support trade creation for Indonesian rubber exports while simultaneously generating significant trade diversion in palm oil, coconuts, and aggregate agricultural trade. Similarly, Danendra et al. (2025) examine the effects of six active ASEAN+6 FTAs on Indonesia's cocoa butter trade and report robust trade creation effects for Indonesian exports. At the same time, their findings indicate that overlapping non-tariff measures and sustainability-related requirements materially shape the extent to which exporters can realize those benefits. Taken together, these studies show that overlapping agreements do not generate a single, uniform liberalization effect. Rather, they produce layered substitution patterns, sector-specific adjustment costs, and administrative frictions that are consistent with the broader literature on differentiated regionalism.

Despite recent progress, an important empirical gap remains. Existing studies on ASEAN-related FTAs still tend to focus on single agreements, selected commodities, or specific bilateral relationships, thereby limiting cross-agreement comparability within a unified analytical design. As a result, it remains difficult to assess whether overlapping ASEAN+6 agreements generate consistent trade creation, asymmetric adjustment, or sector-specific diversionary effects. This study addresses that gap by evaluating six overlapping FTAs—AFTA, ACFTA, AKFTA, AIFTA, AANZFTA, and AJCEP—within a structural gravity framework estimated using Poisson pseudo-maximum likelihood.

The study contributes in three closely related ways. First, it provides a unified, directly comparable assessment of six overlapping ASEAN+6 agreements within a single empirical framework, thereby overcoming the fragmentation of earlier studies, which typically examined one agreement, one commodity group, or highly aggregated trade flows in isolation. Second, it bridges two levels of analysis that are often separated in the literature by linking the broader regional architecture of ASEAN+6 to Indonesia's bilateral trade performance. Third, it identifies sectoral heterogeneity by comparing aggregate trade with primary and manufacturing trade, making it possible to show not only whether overlapping agreements are associated with trade creation and trade diversion, but also how those effects differ across agreements, export–import directions, and product groups. In this sense, the novelty of this study lies not merely in examining ASEAN+6 agreements but in evaluating their overlapping effects jointly within one empirical design and connecting regional-level patterns to country-specific and sector-specific trade outcomes (Handoyo et al., 2021; Purwono et al., 2022; Weidner & Zylkin, 2021; Jung, 2023; Yu et al., 2025).

METHODS

This study employs a quantitative ex post empirical design using a longitudinal panel dataset. The analytical framework is grounded in the structural gravity model of international trade, which provides a microeconomic basis for assessing the trade-creation and trade-diversion effects of regional integration. Gravity models are appropriate because bilateral trade rises with the economic size of trading partners and falls with trade costs,

while free trade agreements alter those costs by changing the institutional conditions of cross-border exchange. In the contemporary literature, gravity specifications have become the dominant empirical framework for evaluating regional trade agreements (Bobowski, 2023; Adam et al., 2023; Yoo & Kim, 2025).

The observation period spans 1993–2020. Excluding 2021–2023 is a deliberate methodological choice rather than a data limitation. The year 2021 marked global supply-chain disruption associated with the COVID-19 pandemic, while 2022 introduced an institutional regime shift with the entry into force of the Regional Comprehensive Economic Partnership. Including post-2020 observations would therefore conflate the overlapping ASEAN+1 architecture examined in this study with a new regional trade framework, while also incorporating pandemic-related shocks. Such a combination would weaken institutional comparability and compromise the structural stability required for a clean *ex post* evaluation of the six targeted agreements. Restricting the sample to 1993–2020 is therefore necessary to isolate trade patterns associated with the pre-RCEP ASEAN+6 configuration and to avoid mixing them with a distinct post-pandemic and post-RCEP transition regime (Park, 2022; Sirang et al., 2026).

The empirical analysis relies on two complementary datasets. The first is a cross-country panel covering 38 countries, comprising the 16 ASEAN+6 regional members and 22 extra-regional trading partners, and is used to estimate regional-level trade effects. Bilateral trade data are obtained from UN COMTRADE, macroeconomic variables from the World Bank’s World Development Indicators, geographic controls from the CEPII GeoDist database, and agreement status from the World Trade Organization’s Regional Trade Agreements database. Trade flows are disaggregated according to the Standard International Trade Classification Revision 4 into primary products (SITC 0–4) and manufactured goods (SITC 5–8), allowing the analysis to capture sectoral heterogeneity.

To capture the substitution effects generated by overlapping FTAs, the regional cross-country gravity equation is specified as follows:

$$E(\text{Trade}_{ijt} \mid X_{ijt}) = \exp [\alpha + \sum_{r=1 \text{ to } 6} \delta_{1r} \text{FTA1}_{r,ijt} + \sum_{r=1 \text{ to } 6} \delta_{2r} \text{FTA2}_{r,ijt} + \sum_{r=1 \text{ to } 6} \delta_{3r} \text{FTA3}_{r,ijt} + \beta'Z_{ij} + \mu_{ij} + \gamma_t] \quad (1)$$

Trade_{ijt} denotes the nominal bilateral trade value from country *i* to country *j* in year *t*; GDP_{it} and GDP_{jt} represent the exporter’s and importer’s real gross domestic product; DIST_{ij} is geographic distance; and Z_{ij} includes contiguity and common official language. FTA1_{r,ijt} equals 1 when both countries are members of agreement *r* in year *t*, capturing intra-bloc trade creation. FTA2_{r,ijt} equals 1 when only the exporter is a member, capturing exports from members to non-members. FTA3_{r,ijt} equals 1 when only the importer is a member, capturing imports of members from non-members. Country-pair and year fixed effects absorb time-invariant bilateral heterogeneity and common shocks.

For the Indonesia-specific analysis, the model is simplified by fixing Indonesia as the home economy:

$$E(\text{Trade}_{jt} | X_{jt}) = \exp [\varphi + \sum_{r=1 \text{ to } 6} \lambda_{1r} \text{FTA1}_{r,jt} + \sum_{r=1 \text{ to } 6} \lambda_{2r} \text{FTA2}_{r,jt} + \psi'W_{jt} + \mu_j + \gamma_t] \quad (2)$$

Trade_{jt} denotes Indonesia's bilateral exports to, or imports from, partner country *j* in year *t*. FTA1_{r,jt} equals 1 when both Indonesia and partner country *j* are members of agreement *r*, whereas FTA2_{r,jt} equals 1 when Indonesia is a member but partner country *j* is not. The vector *W*_{jt} contains the relevant bilateral controls. The model is estimated separately for aggregate trade, primary products, and manufactured goods.

Both models are estimated using the Poisson pseudo-maximum likelihood estimator. PPML is preferable to conventional log-linear ordinary least squares in gravity settings because it accommodates zero-valued trade flows, addresses heteroskedasticity, and avoids retransformation bias (Santos Silva & Tenreyro, 2022). It also remains consistent under broad distributional conditions, making it suitable for bilateral trade panels in which zero flows are common. Recent methodological research further supports the use of PPML with high-dimensional fixed effects because it provides more reliable estimates of agreement effects than traditional OLS-based gravity specifications, particularly when regional arrangements overlap, and multilateral resistance terms must be explicitly controlled for (Bobowski, 2023).

To reduce omitted-variable bias and address the endogeneity of trade-policy variables, the models incorporate high-dimensional fixed effects. In gravity analysis, multilateral resistance matters because bilateral trade depends not only on bilateral trade costs but also on the relative trade barriers each country faces with all other partners. Following this logic, country-pair and year fixed effects are used in the regional specification, while partner-country and year fixed effects are used in the Indonesia-specific specification. Robust standard errors clustered at the country-pair level are employed throughout. The empirical design is intended to evaluate trade patterns within the pre-RCEP ASEAN+6 configuration rather than to estimate post-pandemic or post-RCEP adjustments. Accordingly, the estimated coefficients should be interpreted as conditional associations within a structurally comparable policy environment, not as definitive causal effects.

RESULTS AND DISCUSSION

The empirical results indicate that overlapping trade agreements do not generate a uniform pattern of trade expansion across the ASEAN+6 architecture. At the regional level, ACFTA and AKFTA exhibit the clearest intra-bloc trade creation, whereas AIFTA and AANZFTA show weaker or negative patterns, and AJCEP remains largely neutral. In Indonesia, AKFTA shows the most consistent positive association with aggregate exports and imports, whereas the effects of the other agreements are more selective and asymmetric. Sectorally, manufacturing responds more strongly than primary products, suggesting that the benefits of preferential liberalization are closely tied to production networks and industrial structure rather than being distributed evenly across sectors. These broad patterns are summarized in Table 1 for the aggregate estimations and are further elaborated in Table 2 and Appendix Tables A1–A5.

The baseline gravity estimates confirm that the empirical specification is well-behaved and consistent with standard expectations. Income and market-size variables enter positively, whereas distance remains negatively associated, reflecting persistent trade costs. As reported in Table 1, the core agreement coefficients already show a differentiated structure across arrangements, while the full coefficient matrices in Appendix Tables A1 and A2 confirm that the broader gravity model remains stable across specifications. In this sense, Table 1 should be read as a condensed presentation of the key FTA coefficients, whereas the appendices provide the full econometric detail supporting the same interpretation.

Table 1. Core PPML Gravity Estimates for ASEAN+6 and Indonesia’s Aggregate Trade

Agreement	Regional Cross-Country (Intra-bloc)	Indonesia Exports (Intra-bloc)	Indonesia Exports (Extra-bloc)	Indonesia Imports (Intra-bloc)	Indonesia Imports (Extra-bloc)
ACFTA	1.4315***	-0.2944**	0.3277***	0.3962**	0.1328ns
AKFTA	0.3859***	0.4455***	-0.0802ns	0.5016***	-0.0252ns
AIFTA	-0.3614***	0.2812***	0.0998ns	-0.2649*	0.2265*
AANZFTA	-0.2460***	-0.3652***	-0.1439ns	-0.0151ns	0.0230ns
AJCEP	-0.0720ns	-0.0927ns	-0.1464*	-0.1355ns	0.0060ns

Notes. Table 1 presents the core PPML coefficients for the regional cross-country specification and Indonesia’s aggregate bilateral trade equations, providing a compact summary of the main agreement-level results.

For the cross-country sample, the aggregate FTA indicators suggest a general pattern of intra-bloc expansion within the ASEAN+6 network. Trade among members is positively associated with agreement participation, while exports from members to non-members also remain positive. By contrast, the coefficient for non-member exports to member markets is statistically insignificant, suggesting no systematic displacement of non-members from member markets. In substantive terms, this pattern is more consistent with open regionalism than with a narrow diversion-only interpretation of preferential liberalization. The regional coefficients shown in Table 1 are consistent with the larger cross-country estimates reported in Appendix Tables A1 and A2, where ACFTA and AKFTA continue to stand out more clearly than the other agreements.

Agreement-level heterogeneity becomes more apparent once the aggregate effects are decomposed into their intra- and extra-bloc components. ACFTA shows the clearest positive regional pattern, while AKFTA also exhibits a positive intra-bloc association but with a more mixed extra-bloc structure. By contrast, AIFTA and AANZFTA generate weaker or negative intra-bloc patterns, and AJCEP remains limited across most dimensions. These findings are broadly consistent with earlier studies that identify ACFTA and AKFTA as the most effective channels of intra-bloc trade expansion in the ASEAN+6 setting, while also reinforcing the argument that overlapping FTAs should not be treated as functionally equivalent arrangements. In contrast to single-agreement analyses, the present results show more clearly that, once the six agreements are jointly estimated, the regional pattern becomes highly differentiated. This suggests

that observed trade responses are shaped not only by tariff preferences themselves, but also by differences in agreement depth, rules of origin, and actual preference utilization across member economies. More specifically, these regional results confirm the stronger trade-expanding role of ACFTA and AKFTA documented in earlier ASEAN-related studies, while extending that literature by showing that the hierarchy of agreement effects becomes clearer when six overlapping FTAs are estimated jointly rather than separately. In this respect, the present findings suggest that regional trade responses are shaped not only by formal tariff preferences but also by differences in agreement depth, rules of origin, and firms' ability to operationalize those preferences within regional production networks.

For Indonesia, the benefits of liberalization are clearly asymmetrical. AKFTA shows the most consistent positive association across both exports and imports. ACFTA displays a more uneven structure, with weaker export-side performance than import-side performance, while AIFTA yields selective gains and AANZFTA remains mostly negative or close to zero. AJCEP also appears comparatively weak, with only limited evidence of measurable trade expansion. Taken together, the Indonesia-specific aggregate coefficients in Table 1 indicate that Indonesia's strongest trade association within the ASEAN+6 architecture is linked to AKFTA, with more selective export-side gains under AIFTA and more uneven adjustment under ACFTA. This interpretation is also supported by Appendix Table A3, which shows that the aggregate pattern is not merely an artifact of one particular specification but persists when supplementary sectoral estimations are considered. This Indonesia-specific pattern also helps explain why previous studies sometimes reached mixed conclusions regarding ASEAN-centered liberalization. When regional agreements are assessed separately, their effects may appear more uniformly positive than they actually are. Once they are jointly estimated, however, the asymmetry becomes more visible: AKFTA remains the most consistent channel of trade expansion, while the other agreements exhibit more selective or uneven effects, depending on trade direction and sectoral composition.

Sectoral disaggregation helps explain why the aggregate results differ across agreements. Rather than reproducing lengthy coefficient matrices in the main text, Table 2 summarizes the dominant sectoral pattern for each agreement. This approach keeps the narrative focused, while Appendix Tables A4a and A4b preserve the product-level detail necessary for verification. Accordingly, Table 2 functions as an analytical bridge between the aggregate results in Table 1 and the more granular evidence reported in the appendices. Table 2 shows that agricultural effects are generally weaker and less systematic than those of manufacturing. The clearest agricultural support appears under AKFTA, especially on the export side, whereas ACFTA, AIFTA, and AJCEP do not generate a stable agricultural pattern. AANZFTA stands out as the agreement with the clearest negative agricultural signal. This suggests that agricultural trade within Indonesia's FTA network remains constrained by non-tariff measures, domestic supply limitations, and partner-specific sanitary or technical requirements, all of which may dampen the measurable effect of tariff preferences even when agreements are formally

in force. The broader implication is that agricultural liberalization under overlapping FTAs may be institutionally deeper on paper than in realized market access.

Table 2. Condensed Sectoral Summary of Indonesian Trade Effects

Agreement	Agriculture	Manufacturing	Overall reading
ACFTA	Weak	Limited positive import effects	Weak overall; stronger on manufacturing imports than on agriculture
AKFTA	Selective positive export effects	Strong and broad positive effects	Strongest sectoral performer, especially in manufacturing
AIFTA	Weak	Selective and mixed effects	Limited agriculture; partial manufacturing integration
AANZFTA	Uneven, with some negative effects	Mostly negative on exports	Unstable overall; manufacturing contraction more visible
AJCEP	Minimal	Minimal to negative	Weak and fragmented sectoral impact

Notes. Table 2 summarizes the dominant sectoral patterns across agreements and serves as a bridge between the aggregate estimates in Table 1 and the more detailed SITC-level results reported in Appendix Tables A4a and A4b.

By contrast, manufacturing trade exhibits a much sharper structure. AKFTA generates the strongest and most consistent sectoral effects, combining positive export-side patterns with strong import-side effects across major SITC groups. AIFTA also produces selective manufacturing gains, although these are more fragmented and coexist with weaker or negative coefficients in some specifications. ACFTA is relatively weak on the export side and only occasionally positive for manufacturing imports, whereas AANZFTA shows contractionary export effects in more advanced manufacturing sectors. AJCEP remains weak and fragmented. These patterns support the structural-gravity argument that FTA effects tend to concentrate in sectors linked to intermediate-goods trade, production sharing, and vertical specialization rather than being distributed evenly across all product groups. They also reinforce the interpretation that AKFTA has operated more effectively than the other agreements as a channel through which Indonesia participates in Northeast Asian production networks. Appendix Tables A4a and A4b are important here because they show that the manufacturing advantage is not inferred in an abstract way; it emerges from repeated patterns across SITC group estimations.

The contrast summarized in Table 2 suggests that sectoral heterogeneity is not a secondary feature of Indonesia's FTA experience but rather a defining characteristic. Agricultural trade appears to be constrained by market-access frictions that are not fully resolved by tariff preferences alone, whereas manufacturing trade responds more strongly when agreements are aligned with production networks and intermediate-goods exchange. This distinction helps explain why aggregate trade effects differ across agreements and why some FTAs generate measurable gains only in specific sectors rather than across the trade structure as a whole. More specifically, the findings extend Handoyo et al. (2021) by showing that joint estimation across six overlapping agreements yields stronger evidence

of cross-agreement heterogeneity than single- or aggregate-FTA specifications suggest. The results also complement Purwono et al. (2022) and are consistent with Qu and Zhang (2023), who emphasize that rules of origin and utilization margins materially shape the realized gains from preferential trade agreements.

The sectoral and directional asymmetries observed in Indonesia's trade also align with recent empirical evaluations of regional integration beyond ASEAN. Chigeto et al. (2025), for example, show that in the Global South, regional trade agreements tend to stimulate intra-regional trade in primary and natural resource exports while simultaneously generating trade diversion and import dependence in manufactured goods. This risk of hyper-specialization is therefore not unique to ASEAN. Similarly, the directional heterogeneity observed across ASEAN+6 agreements mirrors the pair-specific asymmetries documented by Jung (2023) in the EU–South Korea FTA. Moreover, the trade diversion observed in more sophisticated sectors is consistent with Nengroo et al. (2025), who find that in developing regions such as South Asia, statutory tariff reductions alone often fail to generate substantial trade creation when they are not accompanied by harmonized non-tariff measures. Taken together, these comparative findings reinforce the emerging view that overlapping FTAs generate fragmented “noodle bowl” effects rather than uniform, across-the-board gains.

The cross-country and Indonesia-specific estimates indicate that ASEAN+6 integration operates as a differentiated, layered institutional arrangement rather than a uniform liberalization regime. At the regional level, the positive aggregate intra-bloc coefficient, together with the absence of a systematically negative aggregate FTA3 coefficient, suggests that ASEAN+6 liberalization is not associated, on average, with a uniform displacement of non-members from member-country markets, a pattern consistent with the literature on East Asian open regionalism in which overlapping agreements coexist with continued trade expansion beyond the bloc. The agreement-level decomposition further shows that this aggregate structure is driven disproportionately by ACFTA and AKFTA, whereas AIFTA and AANZFTA do not exhibit comparable regional effects when all six agreements are estimated jointly. The Indonesia-specific estimates refine this interpretation by showing that the strongest positive associations are concentrated in manufacturing trade under AKFTA and, to a lesser extent, AIFTA, rather than in agriculture or across all agreements simultaneously, indicating that the trade effects of overlapping FTAs are mediated by sectoral composition, partner-specific production linkages, and the operational usability of each agreement. Table 1 presents the summary hierarchy of agreements. Appendix Tables A1 and A2 preserve that hierarchy across more complete specifications, Appendix Table A3 reports the aggregate bilateral structure, and Appendix Tables A4a and A4b indicate that the strongest responses are concentrated in selected sector groups rather than distributed evenly across sectors. This interpretation remains stable when crisis-shock controls are introduced. As summarized in Appendix Table A5, the core gravity variables remain stable, the ranking of agreements is preserved, AKFTA continues to dominate Indonesia's aggregate export and import results, ACFTA remains asymmetric, and neither the

Asian Financial Crisis nor the Global Financial Crisis dummy alters the substantive interpretation of the coefficients. Read together, Table 1, Table 2, and Appendix Tables A1–A5 indicate that the trade effects of overlapping ASEAN+6 agreements differ across agreements, are uneven across sectors, and are contingent on institutional and structural conditions rather than uniform across product groups or trade relationships.

CONCLUSION

This study examined whether overlapping ASEAN+6 agreements are associated with trade creation and trade diversion at the regional level and in Indonesia's bilateral trade across aggregate and sectoral dimensions. The results show that overlapping FTAs do not generate a uniform pattern of trade expansion. At the regional level, ACFTA and AKFTA exhibit the clearest intra-bloc trade creation, whereas AIFTA and AANZFTA remain weaker or negative, and AJCEP is largely neutral. For Indonesia, AKFTA is associated with the most consistent positive export and import performance, while the effects of the other agreements are more selective and asymmetric. The findings also reveal substantial sectoral heterogeneity, with stronger gains in manufacturing than in primary products. Overall, the ASEAN+6 architecture should therefore be understood as a differentiated and uneven structure of regional integration rather than as a functionally homogeneous arrangement.

These findings imply that overlapping trade agreements should be treated as differentiated policy instruments rather than as uniformly beneficial arrangements. To maximize their gains, trade policy should move beyond tariff reductions toward more targeted institutional and industrial responses, including industrial upgrading, deeper participation in regional production networks, harmonized rules of origin, lower non-tariff barriers, and more effective use of trade preferences by firms. The study remains limited by its use of macro-level data, binary FTA indicators, and a non-causal design; accordingly, the estimated coefficients should be interpreted as conditional associations rather than definitive causal effects. Future research should incorporate firm-level data, examine preference utilization behavior more directly, and quantify non-tariff barriers more precisely in order to better identify the channels through which overlapping agreements shape trade outcomes.

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APPENDICES

Appendix Table A1. PPML estimation in fixed effects (cross-country sample)

Variable	Baseline FE	Time-invariant FE	Cross-country FE	Time and cross-country FE
Ln(GDPcap_it)	0.7549***	0.8145***	0.6241***	0.6647***
Ln(GDPcap_jt)	0.7935***	0.8482***	0.6542***	0.6860***
Ln(DIST_ij)	-0.6712***	-0.6667***	-0.8354***	-0.8354***
Ln(POP_it)	0.6408***	0.6646***	0.1550	0.3790*
Ln(POP_jt)	0.6660***	0.6875***	0.5106***	0.6633***
ACFTA_1	1.4315***	1.5619***	0.1200	0.0290
ACFTA_2	0.9751***	1.1067***	0.2515***	0.2025***
ACFTA_3	0.5670***	0.6937***	0.0390	0.0040
AKFTA_1	0.3859***	0.4539***	0.0770	0.0990
AKFTA_2	0.0090	0.0620	-0.2239***	-0.2138***
AKFTA_3	-0.2063***	-0.1694**	-0.2587***	-0.2493***
AIFTA_1	-0.3614***	-0.2170**	-0.1925**	-0.2049**
AIFTA_2	-0.3289***	-0.2429***	-0.0020	-0.0120
AIFTA_3	0.0320	0.1417**	0.1003*	0.0951*
AANZFTA_1	-0.2460***	-0.2537***	-0.2557***	-0.2533***
AANZFTA_2	-0.1852**	-0.1894**	-0.0810	-0.0780
AANZFTA_3	-0.0510	-0.0590	-0.0430	-0.0370
AJCEP_1	-0.0720	-0.0540	0.0240	0.0670
AJCEP_2	-0.1656**	-0.1140	-0.2093***	-0.1608**
AJCEP_3	-0.3375***	-0.2928***	-0.1699**	-0.1300
Constant	-10.5354***	-12.2110***	5.1227*	-2.0890
N	40,243	40,243	40,243	40,243

Notes: FE = fixed effects. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Source: Author's calculations based on the cross-country PPML dataset.

Appendix Table A2. PPML results for the cross-country sample

Variable	(1) Aggregate FTA	(2) ACFTA	(3) AKFTA	(4) AIFTA	(5) AANZFTA	(6) AJCEP	(7) Full model
Ln(GDPcap_it)	0.756***	0.770***	0.722***	0.697***	0.698***	0.683***	0.755***
Ln(DIST_ij)	-0.684***	-0.687***	-0.680***	-0.674***	-0.687***	-0.676***	-0.671***
Ln(POP_it)	0.682***	0.662***	0.740***	0.717***	0.729***	0.716***	0.641***
Ln(GDPcap_jt)	0.770***	0.788***	0.773***	0.774***	0.761***	0.747***	0.794***
Ln(POP_jt)	0.689***	0.674***	0.716***	0.708***	0.716***	0.703***	0.666***
FTA_1	0.954***						
FTA_2	0.507***						
FTA_3	0.075						
ACFTA_1		1.163***					1.432***
ACFTA_2		0.827***					0.975***
ACFTA_3		0.468***					0.567***
AKFTA_1			1.109***				0.386***
AKFTA_2			0.357***				0.009
AKFTA_3			0.176***				-0.206***
AIFTA_1				0.755***			-0.362***
AIFTA_2				0.071			-0.329***
AIFTA_3				0.193***			0.032
AANZFTA_1					0.845***		-0.246***
AANZFTA_2					0.263***		-0.185**
AANZFTA_3					0.220***		-0.051
AJCEP_1						0.630***	-0.072
AJCEP_2						0.032	-0.166**
AJCEP_3						-0.093	-0.338***
Constant	-11.367***	-11.06***	-12.56***	-11.78***	-11.908***	-11.215***	-10.535***
N	40,243	40,243	40,243	40,243	40,243	40,243	40,243

Notes: *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Blank cells indicate that the corresponding agreement indicator was not included in that reduced-form specification. Source: Author's calculations based on the cross-country PPML dataset.

Appendix Table A3. Indonesia's aggregate trade results and selected supplementary sectors

Variable	Export Total	Import Total	Export SITC 2	Export SITC 3	Import SITC 2	Import SITC 3	Export SITC 9	Import SITC 9
Ln(GDPcap_it)	0.0468	0.5604***	0.4060	0.3073	0.3464	0.7631	-2.1567***	0.2366
Ln(GDPcap_jt)	1.0036***	1.0240***	1.097***	1.4560***	0.9007***	0.4365***	1.3111***	2.6948***
Ln(POP_it)	-0.0342	-3.1557***	-1.850	-3.1723*	-1.8829	-0.5383	-6.2628*	-5.0126
Ln(POP_jt)	0.9999***	0.9088***	1.325***	1.6987***	0.8867***	0.2459***	0.2344**	1.5260***
Ln(DIST_ij)	-1.4961***	-1.4320***	-1.695***	-2.7811***	-0.3427***	-1.6978***	-1.1036***	-4.8730***
ACFTA_1	-0.2944**	0.3962**	-0.1594	-1.0470***	-0.8945***	0.6072	0.3537	-1.7867
ACFTA_2	0.3277***	0.1328	0.711***	0.8482**	-0.1205	1.2534**	-0.0557	2.1405
AKFTA_1	0.4455***	0.5016***	0.4201*	1.1544***	0.8636***	0.1361	1.2803*	-0.3795
AKFTA_2	-0.0802	-0.0252	-0.2083	-0.3366	0.1959	-0.7667*	2.2930***	1.4672
AIFTA_1	0.2812***	-0.2649*	-0.4282*	-0.0004	0.2675	-0.2789	1.7621***	3.7852***
AIFTA_2	0.0998	0.2265*	0.2120	0.2014	0.1924	0.2942	1.3957**	3.8478***
AANZFTA_1	-0.3652***	-0.0151	-1.171***	-0.2971*	0.9332***	-0.1413	0.4263	-0.5015
AANZFTA_2	-0.1439	0.0230	-0.409***	-0.3236*	-0.1924	0.0184	-0.0589	0.2437
AJCEP_1	-0.0927	-0.1355	0.3452*	-0.2880*	-0.4715***	-0.5870*	1.2623***	0.3582
AJCEP_2	-0.1464*	0.0060	-0.2824*	-0.4809**	0.1448	-0.1541	0.9544	0.9164*
Constant	7.3462	64.0962***	32.0651	58.1470*	30.5825	29.6994	144.9500**	93.0474
N	1,103	1,103	1,092	853	1,089	919	703	386

Notes: *, **, and *** denote significance at the 5%, 1%, and 0.1% levels, respectively, following the notation reported in the original appendix. Source: Author's calculations based on the Indonesia PPML dataset.

Appendix Table A4a. Indonesia PPML estimates by agricultural product groups

Variable	Export SITC 0	Export SITC 1	Export SITC 4	Import SITC 0	Import SITC 1	Import SITC 4
Ln(GDPcap_it)	-0.0648	0.0990	0.7552*	0.2387	0.6976	1.0244*
Ln(GDPcap_jt)	1.0040***	0.0076	0.1855***	0.5569***	0.3968***	0.4109***
Ln(POP_it)	-0.4430	2.1698	2.5700	0.4719	-1.1137	-7.3175***
Ln(POP_jt)	0.9003***	0.1297**	0.6183***	0.6761***	0.7847***	0.4695***
Ln(DIST_ij)	-0.9158***	-1.1925***	-0.9284***	-0.4209***	-0.7849***	-1.6736***
ACFTA_1	-0.1615	0.1267	0.2921	0.1715	0.2512	-0.0061
ACFTA_2	0.0197	-0.0171	0.2689	-0.1062	-0.6562*	0.0972
AKFTA_1	0.6594***	0.5863*	-0.2588	-0.2834	0.5555	0.3535
AKFTA_2	0.0818	-0.1105	0.5494*	0.3655	0.1793	0.3425
AIFTA_1	0.3088	0.0728	0.3170	-0.1045	-0.4577	-0.0878
AIFTA_2	0.1110	0.4174	-0.3950	0.2442	0.0791	0.1714
AANZFTA_1	0.3511*	0.2780	-0.7909**	1.6246***	0.0404	0.1869
AANZFTA_2	0.0620	-0.1306	-0.0615	-0.5542*	0.0737	-0.2049
AJCEP_1	0.0149	-0.0187	-0.3502	-0.5266	-0.4046*	0.2561
AJCEP_2	0.0885	0.3224	-0.2893*	0.1449	0.0632	0.3729*
Constant	9.9786	-18.9596	-41.3142	-5.9388	21.2352	149.9407***
N	1,100	1,027	1,060	1,059	867	752

Notes: *, **, and *** denote significance at the 5%, 1%, and 0.1% levels, respectively, following the notation reported in the original appendix. Source: Author's calculations based on the Indonesia PPML dataset.

Appendix Table A4b. Indonesia PPML estimates by manufacturing product groups

Variable	Export SITC 5	Export SITC 6	Export SITC 7	Export SITC 8	Import SITC 5	Import SITC 6	Import SITC 7	Import SITC 8
Ln(GDPcap_it)	0.0207	0.0061	-0.1173	-0.1567	0.3523*	0.5606*	0.7528***	0.6501**
Ln(GDPcap_jt)	0.5995***	0.8483***	0.9716***	1.6882***	1.0175***	1.0306***	1.3498***	1.1070***
Ln(POP_it)	3.7464***	-0.5258	5.2075***	-0.4332	-1.1901	-4.4368***	-6.0217***	-2.4880**
Ln(POP_jt)	0.7926***	0.7935***	0.7015***	0.8180***	0.9094***	1.2147***	1.2451***	0.9907***
Ln(DIST_ij)	-1.217***	-1.292***	-1.402***	-0.2641*	-1.299***	-1.8361***	-1.5764***	-1.380***
ACFTA_1	0.1156	-0.0077	-0.1709	0.0051	0.2189	-0.0611	0.3638*	0.4373*
ACFTA_2	0.0692	0.1320	0.0308	-0.1034	-0.0577	0.3174	0.0203	-0.3728
AKFTA_1	0.2212*	0.2791**	0.0121	0.2421	0.4438***	1.0788***	0.8881***	0.4974*
AKFTA_2	-0.1569	-0.1421	-0.2861	-0.0579	-0.1347	-0.0706	0.1932	0.1286
AIFTA_1	0.1455	-0.1276	0.0727	0.9817***	0.1513	-0.7757***	-0.1725	-0.3321*
AIFTA_2	0.3171**	0.1636	-0.1638	0.1088	-0.0080	0.4730**	0.0388	0.2453
AANZFTA_1	-0.1535	-0.1890	-0.4183**	-0.3300*	-0.2179	0.0961	-0.2597	-0.1384
AANZFTA_2	-0.1883	-0.1708	-0.2490*	0.2290	0.1866*	0.1592	0.0823	0.2858**
AJCEP_1	-0.1814*	-0.0598	-0.0725	0.0082	-0.0828	0.2132	0.2233	0.1908
AJCEP_2	-0.1204	0.2027	-0.543***	-0.0074	-0.0200	-0.0480	-0.1149	0.1832*
Constant	-63.003***	18.8616	-89.23***	-0.0716	24.9420	84.5114***	108.566***	44.488**
N	1,101	1,103	1,101	1,102	1,065	1,084	1,085	1,086

Notes: *, **, and *** denote significance at the 5%, 1%, and 0.1% levels, respectively, following the notation reported in the original appendix. Source: Author's calculations based on the Indonesia PPML dataset.

Appendix Table A5. Summary of Robustness Check with AFC and GFC Crisis Controls

Model block	Main result without crisis controls	Result with crisis controls	Robustness conclusion
Cross-country gravity controls	Core gravity variables are positive for GDP and population and negative for distance	Signs and magnitudes remain virtually unchanged	Baseline gravity structure is robust
Cross-country FTA effects	ACFTA and AKFTA show the clearest positive intra-bloc effects; AIFTA, AANZFTA, and AJCEP remain weaker or negative	The same qualitative ranking is preserved after AFC and GFC controls are added	Agreement-level interpretation remains stable
Indonesia's aggregate exports	AKFTA is the strongest positive agreement; ACFTA is asymmetric; AANZFTA and AJCEP are weaker	Same directional pattern remains after crisis controls	Export-side findings are robust
Indonesia aggregate imports	AKFTA remains the strongest positive association; ACFTA remains more favorable on imports than exports	The same qualitative structure is preserved, with only modest coefficient shifts	Import-side findings are robust
Crisis dummies	Not included in baseline	AFC shows a significant effect in the cross-country specification, while GFC is weaker and does not overturn the agreement structure	Crisis episodes do not drive the main FTA results

Notes. This table summarizes the comparison between the baseline and crisis-shock specifications. Its purpose is to summarize whether the direction and substantive interpretation of the main coefficients change after adding AFC and GFC controls.