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Beyond Coal: Sectoral Mapping and Diversification Potential in East Kalimantan

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Abstract

East Kalimantan remains dependent on mining and quarrying, which accounted for 44.39% of gross regional domestic product (GRDP) in 2025, and the relocation of Indonesia's capital (Nusantara) has made new growth sources urgent. This study identifies the base, potential, and leading sectors of East Kalimantan in 2016–2025 as input for the 2025–2029 development plan. BPS data on national GDP and provincial GRDP at constant 2010 prices by industry, with 2024 preliminary and 2025 very preliminary, are analyzed with the Location Quotient and Dynamic LQ, the Growth Ratio Model, and classic and Esteban-Marquillas shift-share, synthesized in a modified overlay whose four criteria are each compared with unity; the decomposition is repeated for three sub-periods and re-estimated on 2016–2023 final data. Mining remains the only base sector (mean LQ 6.01) but sits in a nationally slow-growing industry producing almost the entire negative industry-mix effect. Among non-mining sectors, trade and education are competitive in every sub-period and partition tested, gaining IDR 7,531.72 and 1,294.48 billion, ahead of accommodation (755.70) and electricity and gas (172.64), which are partition-dependent. On final data the base sector, all 17 quadrant memberships, and 14 competitive signs hold; mining's competitive component turns negative. The contribution is empirical and methodological: it corrects a redundancy in the conventional overlay and tests every classification against a final-data window, three partitions, and four aggregation rules. These diagnostics capture concentration and growth, not linkages, employment, or fiscal transmission; linkage strength is not measured, the economy remains highly concentrated in mining, and diversification is the central challenge.

KEYWORDS

economic base; location quotient; shift-share; structural transformation; resource dependence; east kalimantan.

Introduction

Modern economic growth is, at its core, a process of structural transformation in which the shares of output and employment shift away from primary activities toward industry and services (Kuznets, 1973). For resource-rich regions this process is neither automatic nor smooth: a booming extractive sector can crowd out other tradable activities through factor and spending effects (Corden & Neary, 1982), and cross-country evidence associates heavy natural-resource dependence with slower long-run growth (Sachs & Warner, 2001). Converting resource rents into new engines of growth therefore requires an accurate empirical map of which sectors are base, potential, or lagging. Indonesia's economic geography sharpens this concern, because its resource-rich provinces off Java have historically followed growth paths that diverge from the national pattern and track commodity cycles (Hill et al., 2008).

East Kalimantan is a leading case. The province, on the eastern side of the island of Kalimantan, has a land area of 127,346.92 km², is administratively divided into seven regencies and three cities with Samarinda as its capital (BPS Provinsi Kalimantan Timur, 2026), and is one of Indonesia's main producers of coal, crude oil, and natural gas, and location-quotient evidence confirms that its extractive and processing industries, led by coal, dominate the provincial economy (Kusuma et al., 2023). It has long been the largest economy on the island, generating around 4.6% of national gross value added in 2025.

Table 1. GRDP at Constant 2010 Prices of East Kalimantan Province in 2016–2025 (in IDR Billion)

Economic Sector	2016	2017	2018	2019	2020	2021	2022	2023	2024*	2025**
Agriculture, Forestry, and Fishing	28,639	30,261	32,140	33,355	33,027	33,004	33,713	34,551	35,369	38,094
Mining and Quarrying	212,650	216,447	218,687	233,681	222,909	227,989	235,975	248,180	265,126	264,845
Manufacturing	93,741	96,365	96,798	96,802	93,910	96,210	99,658	104,364	104,527	117,780
Electricity and Gas	223	239	262	285	317	325	337	391	456	483
Water Supply; Sewerage, Waste Management, and Remediation Activities	202	219	225	235	248	259	278	299	322	347
Construction	29,510	31,211	33,754	35,912	35,601	37,005	39,881	46,190	52,472	52,380
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	22,129	23,948	25,679	26,916	27,070	28,217	30,116	32,196	34,955	38,811
Transportation and Storage	12,384	13,184	13,938	14,216	13,281	13,667	15,274	16,742	18,085	19,626
Accommodation and Food Service Activities	3,464	3,754	4,080	4,340	4,108	4,193	4,572	4,924	5,498	6,215
Information and Communication	6,484	6,989	7,295	7,753	8,338	8,994	9,682	10,348	11,159	12,189
Financial and Insurance Activities	6,573	6,526	6,752	6,966	7,138	7,320	8,012	8,952	9,552	9,360
Real Estate Activities	3,902	4,033	4,227	4,292	4,321	4,290	4,398	4,591	4,861	5,270
Business Activities	825	854	896	918	890	912	960	1,024	1,102	1,204
Public Administration and Defence; Compulsory Social Security	7,838	7,566	7,941	8,268	7,951	8,108	8,727	9,426	10,925	12,063
Education	5,929	6,328	6,780	7,036	7,245	7,420	7,680	8,051	8,482	9,181
Human Health and Social Work Activities	2,326	2,492	2,691	2,831	3,404	3,861	4,043	4,321	4,536	4,987
Other Services Activities	2,185	2,326	2,549	2,716	2,635	2,666	2,851	3,078	3,399	3,825
Total GRDP	439,004	452,742	464,694	486,523	472,393	484,440	506,159	537,630	570,824	596,661

Source: BPS Provinsi Kalimantan Timur (2020, 2023, 2026), processed. Note: figures for 2024 are preliminary and figures for 2025 are very preliminary.

Its strategic position was reinforced when Law of the Republic of Indonesia Number 3 of 2022 on the National Capital designated parts of Penajam Paser Utara and Kutai Kartanegara regencies as the site of Nusantara, the new national capital, placing the province at the center of one of Indonesia's largest ongoing public investment programs, a process that is already reshaping land use and settlement in the surrounding regencies (Syaban & Appiah-Opoku, 2024).

The regional economy nevertheless remains heavily concentrated: mining and quarrying contributed 48.44% of GRDP at constant 2010 prices in 2016 and still 44.39% in 2025, followed by manufacturing at 19.74%. Growth therefore tracks commodity cycles, at 3.13% in 2017, 2.64% in 2018, –2.90% in 2020, 6.22% in 2023, 6.17% in 2024, and 4.53% in 2025 (Table 1).

Non-mining GRDP grew faster than total GRDP in seven of the nine years and reached 8.54% in 2025, when mining contracted slightly (–0.11%) (Figure 1). Construction grew 15.82% in 2023 and 13.60% in 2024 during the initial new-capital construction phase, then flattened in 2025 (–0.17%).

Growth outside the extractive sector is thus strengthening, but how much of it is durable and how much depends on new-capital spending remains an open question.

The policy context has also changed. Regional Regulation of East Kalimantan Province Number 1 of 2025 on the Regional Medium-Term Development Plan (RPJMD) 2025–2029 positions the province as the economic superhub of the new capital, with the vision “Kaltim Sukses Menuju Generasi Emas” and four priorities: education, health, quality infrastructure, and an inclusive economy. Sectoral evidence is a precondition for implementing it.

The study addresses three questions. RQ1: which sectors are base sectors, and which are moving toward base status, judged by the static and dynamic location quotient? RQ2: how is growth in 2016–2025 decomposed into national, industry-mix, and competitive components, and how stable is that decomposition across the pre-pandemic (2016–2019), pandemic (2019–2022), and new-capital (2022–2025) sub-periods?

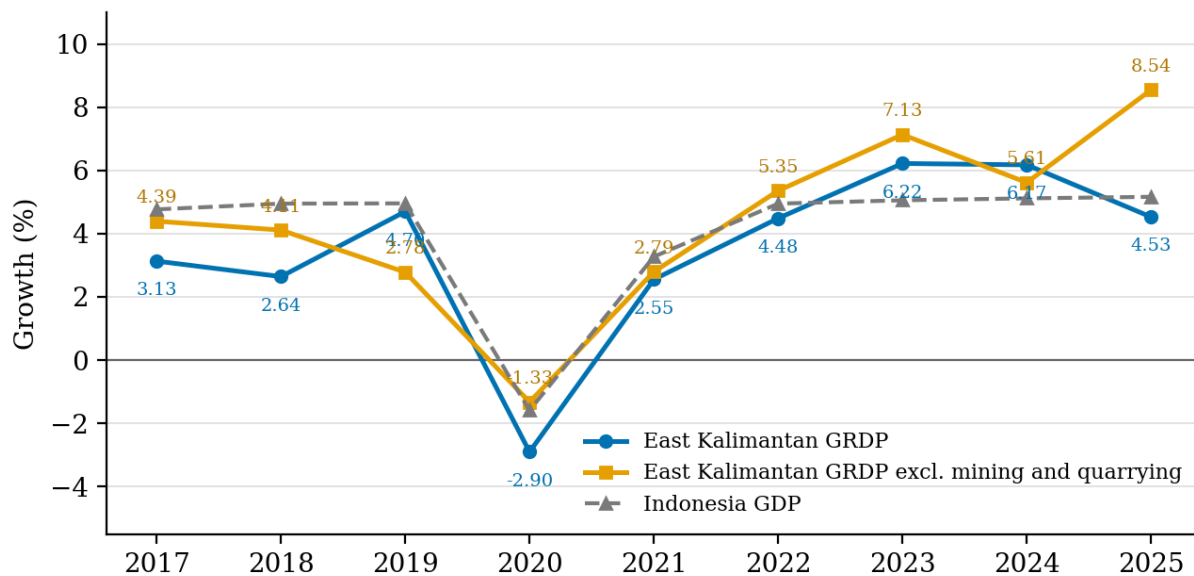


Figure 1. GRDP Growth of East Kalimantan Province With and Without Mining and Quarrying, 2017–2025

Source: BPS (Statistics Indonesia and East Kalimantan Province), 2020, 2023, and 2026, processed.

RQ3: which sectors qualify as leading or potential when concentration, trajectory, national dynamism, and regional competitiveness are assessed as independent criteria, and what does this imply for the RPJMD 2025–2029? Relative to the closest prior study (Putra et al., 2025), the contribution is empirical, methodological, and policy-oriented in turn: a longer observation window that isolates the new-capital sub-period and separates final from preliminary data; a corrected overlay synthesis whose four criteria are algebraically non-redundant; and a translation of the resulting sectoral structure into the priorities of the RPJMD 2025–2029.

Economic Base Theory, the Location Quotient, and Its Limits

The identification of potential sectors rests on economic base theory, which divides a regional economy into base activities that sell beyond the region and non-base activities that serve local demand; regional growth is driven by expansion of the base (Sjafrizal, 2008; R. Tarigan, 2005). The location quotient is its standard operational measure. Its limitations are equally standard: the LQ assumes uniform productivity and consumption patterns across regions and homogeneous products within industries, so it approximates rather than measures the true export base, particularly in resource enclaves (Isserman, 1977). Because the static LQ is silent on the direction of change, dynamic extensions, introduced in the Indonesian literature by Suyatno (2000), compare the growth path of a sector in the region with that of its national counterpart to indicate whether base status is being gained or lost (Hidayah et al., 2023). This study uses both forms.

Shift-Share Analysis and Its Refinements

Shift-share analysis, introduced by Dunn (1960), decomposes regional growth into a national component, an industry-mix component, and a competitive or differential component. Esteban-Marquillas (1972) separated the competitive effect from the influence of the regional industrial structure by evaluating it at homothetic output and isolating a residual allocation effect, and later work has catalogued the alternative identities and their sensitivity to formulation (Loveridge & Selting, 1998) as well as ways of embedding sectoral structure more fully in the decomposition (Márquez et al., 2009). A recognized weakness of point-to-point decompositions is their dependence on the choice of base and terminal years; dynamic or sequential applications across

sub-periods, which update the weights as the structure changes, reduce this sensitivity (Barff & Knight, 1988). This study therefore decomposes 2016–2025 into three economically distinct sub-periods.

Empirical Studies on Indonesian Resource-Rich Regions

Applications of these tools to Indonesian regions are extensive. At the district level, combinations of LQ, shift-share, and typology analysis are routinely used to rank leading sectors at the provincial level (Sutanti, 2022) and the district level, including in Kalimantan (Harjanti et al., 2021), and leading-sector status has been linked empirically to employment and investment outcomes (Soleh & Maryoni, 2017). Shift-share has also been used to gauge regional competitiveness directly, for example in East Java, where the extractive sectors were found to have ceded their role as the economic backbone to trade, construction, and services (Khusaini, 2015), and it continues to guide development planning in resource-based regencies (Abadi et al., 2024). For Kalimantan as a whole, Pratiwi and Kuncoro (2016) documented strong spatial concentration of growth poles in mining districts, and Hill et al. (2008) place East Kalimantan among the archetypal resource-rich provinces whose fortunes track commodity cycles. In resource-dependent Papua, De Fretes (2017) identified seven base sectors led by mining and quarrying. More broadly, combining static and dynamic location quotients with shift-share has become a standard way of sorting district and provincial sectors into mainstay, leading, and potential categories (Saragih et al., 2024), and for East Kalimantan specifically, location-quotient analysis of export commodities confirms coal and oil-and-gas processing as the province's leading base activities (Kusuma et al., 2023). Two recent strands speak directly to the East Kalimantan setting: Maswardani et al. (2025) mapped base sectors in the four hinterland districts of the new capital with LQ, DLQ, and overlay analysis for 2010–2023, and input-output simulations show that a decline in coal exports depresses output in every sector of the provincial economy, with mining itself absorbing about three-quarters of the total impact (Randa et al., 2025). The study closest to this one is Putra et al. (2025), which applied LQ, DLQ, and shift-share to East Kalimantan for 2019–2023 and concluded that mining remained dominant and that diversification, human capital, and renewable energy were urgent in view of the new national capital superhub agenda. None of these studies, however, isolates the new-

Table 2. Positioning of the Present Study Relative to the Closest East Kalimantan and Resource-Region Studies

No	Study, Region, and Period	Methods	Main Finding	Difference from the Present Study
1	Putra et al. (2025); East Kalimantan; 2019–2023	LQ, DLQ, classic shift-share	Mining remains dominant; diversification, human capital, and renewable energy are urgent under the new-capital superhub agenda	Closest prior study. Uses a single undivided window, does not separate final from preliminary figures, and applies the conventional criterion set. The present study adds a three-regime decomposition, a 2016–2023 final-data window, and non-redundant overlay criteria
2	Maswardani et al. (2025); four hinterland districts of the new capital; 2010–2023	LQ, DLQ, conventional overlay	Base sectors mapped for the districts immediately surrounding the new capital	District rather than provincial coverage; applies the conventional overlay whose criterion redundancy is demonstrated and corrected here
3	Kusuma et al. (2023); East Kalimantan; export commodities	LQ	Coal and oil-and-gas processing confirmed as the province's leading base activities	Commodity-level concentration only. The present study covers all 17 GRDP industries and adds trajectory, national-dynamism, and competitiveness criteria
4	Randa et al. (2025); East Kalimantan	Input-output simulation	A fall in coal exports depresses output in every sector, with mining absorbing about three-quarters of the total impact	Supplies the intersectoral linkage evidence that ratio-based diagnostics cannot. The present study defers its structural interpretation to this evidence rather than inferring linkages from LQ and shift-share
5	Pratiwi & Kuncoro (2016); Kalimantan	Growth-pole and spatial concentration analysis	Growth poles are strongly concentrated in mining districts	Spatial rather than sectoral unit of analysis, and no decomposition by economic regime
6	De Fretes (2017); Papua	LQ, shift-share	Seven base sectors identified, led by mining and quarrying	Comparative resource-region benchmark. No robustness test against preliminary data and no independence check on the synthesis criteria
7	Khusaini (2015); East Java	Shift-share	Extractive sectors have ceded the economic backbone role to trade, construction, and services	Contrasting non-resource-dependent case. The present study finds no comparable handover in East Kalimantan, where mining remains the sole base sector

Source: compiled by the author from the studies cited.

capital period, tests sensitivity to preliminary data, or addresses the redundancy in the conventional overlay synthesis identified below. Table 2 positions this study against the closest works; because it rests on a targeted rather than a registered systematic search, it is a positioning against the closest identified studies, not an exhaustive census of the field.

Novelty statement. The individual instruments are long established, and no methodological invention is claimed for them. The contribution is stated on three levels.

Empirical novelty. East Kalimantan has been examined recently with overlapping tools by Putra et al. (2025) and by Maswardani et al. (2025), as Table 2 records, and no claim is made that the province is under-studied. What is new is the design: 2016–2025 is partitioned into pre-pandemic, pandemic and recovery, and new-capital regimes, which separates competitiveness that persists across regimes from competitiveness generated by the capital-relocation stimulus, and every classification is re-estimated on a 2016–2023 window of final BPS figures.

Methodological novelty

The study corrects a redundancy in the conventional overlay synthesis, in which two of the four criteria reproduce the other two. The modified set, namely concentration (mean $LQ > 1$), trajectory ($DLQ > 1$), national dynamism ($RPr > 1$), and regional competitiveness ($RPs > 1$), carries no such identity and yields six patterns instead of three (Table 9).

Policy novelty. The classification is read directly against the RPJMD 2025–2029, matching each of the plan's four priorities to the sectors identified as durable, contingent, or lagging.

This design separates sectors lagging within nationally dynamic industries from manufacturing, divides improving non-base sectors into rising stars and regionally driven sectors, carries the industry-mix warning into the classification of mining, and shows that the competitive gains of construction and mining depend on 2022–2025 or on preliminary data.

On the basis of the studies in Table 2, this combination has not, to the author's knowledge, been applied to East Kalimantan or a comparable province hosting a new capital; this characterizes the reviewed literature and is not a claim of priority. The study therefore aims to identify the base, potential, and leading sectors of East Kalimantan in 2016–2025 and to translate them into medium-term development priorities.

Methods

Research Type

This quantitative, descriptive-analytical study uses secondary time-series data and combines the location quotient and its dynamic form, the Growth Ratio Model, classic and Esteban-Marquillas shift-share, and a modified overlay. The design is longitudinal (2016–2025) and benchmarks the province against the national economy.

Data and Coverage

Data were obtained from BPS. The analysis uses the GDP of Indonesia and the GRDP of East Kalimantan Province at constant 2010 prices by industry, covering the 17 main categories of business fields in the period from 2016 to 2025 (BPS, 2026; BPS Provinsi Kalimantan Timur, 2026). Figures for 2024 are preliminary and those for 2025 very preliminary.

Aggregates sum gross value added across the 17 industries, excluding taxes less subsidies on products. Shift-share is computed for the full period and for three sub-periods: 2016–2019 (pre-pandemic), 2019–2022 (pandemic and initial recovery), and 2022–2025 (commodity boom and new-capital construction). All classifications are also recomputed on a 2016–2023 window of final data. Worksheets are provided as supplementary tables S1–S8.

The breakpoints follow observable events: 2019 is the last year before the COVID-19 contraction, and 2022 is when Law Number 3 of 2022 on the National Capital came into force. Because 2016 is a coal-price trough, sub-periods are reported alongside the full period. The decomposition is descriptive and identifies no causal effect of the pandemic or the capital relocation. Under three alternative partitions (isolating 2019–2020, or moving the new-capital boundary to 2021 or 2023), the aggregate and mining swings, the competitive gain of construction, and the competitiveness of trade and education all hold, whereas electricity and gas and accommodation turn slightly negative in some windows.

Each year is taken from the most recent edition in which it appears. National figures for 2016 and 2017 come from *Statistik Indonesia 2020* (catalogue 1101001, publication 03220.2007, released 29 April 2020), those for 2018 to 2020 from *Statistik Indonesia 2023* (catalogue 1101001, publication 03200.2303, released 28 February 2023), and those for 2021 to 2025 from *Statistik Indonesia 2026* (catalogue 1101001, publication 03200.26006, released 27 February 2026); all three carry ISSN 0126-2912. The provincial figures follow the same sequence in *Provinsi Kalimantan Timur Dalam Angka* for 2020 (catalogue 1102001.64, publication 64560.2002, released 27 April 2020), 2023 (catalogue 1102001.64, publication 64000.2303, released 28 February 2023), and 2026 (catalogue 1102001.64, publication 64000.26002, released 27 February 2026), all carrying ISSN 0215-2266. All were accessed in April 2026. Revisions between editions altered levels only marginally and changed the sign of no indicator.

Location Quotient (LQ) and Dynamic LQ (DLQ)

LQ compares the share of a sector in the economy of the study region with the share of the same sector in the reference economy (Sjafrizal, 2008; R. Tarigan, 2005). Using GRDP as the indicator, the LQ of sector i in region j is formulated as:

$$LQ_{ij} = (E_{ij} / E_j) / (E_{in} / E_n) \quad (1)$$

where E_{ij} is the output of sector i in the region, E_j is the total GRDP of the region, E_{in} is the output of sector i in the reference area (Indonesia), and E_n is total national GDP. A sector with $LQ > 1$ is a base sector. The LQ is averaged over 2016–2025, because annual values move with commodity prices; seven alternative specifications, including final data only, all identify mining as the only sector above unity. The LQ inherits the standard assumptions of uniform productivity and consumption patterns across regions, so its results are read as indicators of relative concentration rather than exact export shares (Isserman, 1977).

The DLQ compares the growth trajectory of a sector in the region with that of the same sector nationally:

$$DLQ_{ij} = \{[(1 + g_{ij}) / (1 + g_j)] / [(1 + g_{in}) / (1 + g_n)]\}^t \quad (2)$$

where g_{ij} and g_j are the compound annual growth rates of sector i and of total GRDP in the region, g_{in} and g_n are the national equivalents, and $t = 9$; arithmetic means yield the same classification. The exponent compounds the annual relative-growth differential over the observation period, so $DLQ > 1$ indicates that, if the observed growth pattern persisted, the sector's regional share would converge toward or above its national share, and the sector can be expected to become, or to remain, a base sector (Hidayah et al., 2023; Suyatno, 2000). The DLQ indicates direction, not a forecast,

and is therefore combined with the LQ level. Combining the two indices produces the four-quadrant classification of Kuncoro (2012): Quadrant I ($LQ > 1$, $DLQ > 1$) is the leading category (*sektor unggulan*), a base sector both now and prospectively; Quadrant II ($LQ > 1$, $DLQ < 1$) is the prospective category (*sektor prospektif*), a current base sector whose relative growth is fading; Quadrant III ($LQ < 1$, $DLQ > 1$) is the mainstay category (*sektor andalan*), not yet a base sector and growing faster in relative terms than its national counterpart, which indicates directional momentum rather than convergence within any particular horizon; and Quadrant IV ($LQ < 1$, $DLQ < 1$) is the underdeveloped category (*sektor terbelakang*), neither base nor progressing.

Growth Ratio Model (GRM)

GRM analysis describes potential economic activities or sectors based on the growth criteria of the study region and the reference region (Muljarijadi, 2011; Yusuf, 1999). It uses two growth ratios, the growth ratio of the reference area (RP_r) and the growth ratio of the study area (RP_s):

$$RP_r = (\Delta E_{in} / E_{in}) / (\Delta E_n / E_n) \quad (3)$$

$$RP_s = (\Delta E_{ij} / E_{ij}) / (\Delta E_{in} / E_{in}) \quad (4)$$

where ΔE_{ij} , ΔE_{in} , and ΔE_n are the changes in output of sector i in the region, of sector i nationally, and of total national output. A value above 1 is denoted (+). Four classes result: RP_r (+) and RP_s (+), dominant growth; RP_r (+) and RP_s (–), prominent nationally but not regionally; RP_r (–) and RP_s (+), a regionally potential sector; and RP_r (–) and RP_s (–), low growth at both levels.

Shift-Share Analysis

Classic shift-share decomposes the change in regional output between the initial and final year (D_{ij}) into a national growth component (N_{ij}), an industry-mix component (M_{ij}), and a competitive or differential component (C_{ij}) (Dunn, 1960; Sjafrizal, 2008):

$$D_{ij} = N_{ij} + M_{ij} + C_{ij} \quad (5)$$

with $N_{ij} = E_{ij} \cdot r_n$, $M_{ij} = E_{ij} (r_{in} - r_n)$, and $C_{ij} = E_{ij} (r_{ij} - r_{in})$, where r_n , r_{in} , and r_{ij} are the growth rates over the analysis window of national GDP, of sector i nationally, and of sector i in the region, respectively (on the menu of alternative identities, see Loveridge & Selting, 1998). M_{ij} is positive when the sector grows faster nationally than the national average, and C_{ij} when it grows faster in the region than nationally. Following the logic of dynamic shift-share (Barff & Knight, 1988), the decomposition is repeated for each sub-period using the sub-period's initial-year values as weights, so that structural change is reflected in the weights rather than frozen at 2016.

Esteban-Marquillas (1972) modified the competitive component to remove its correlation with the regional industrial structure. The competitive effect is evaluated at homothetic output $E^*_{ij} = E_j (E_{in} / E_n)$, the output sector i would have if the region shared the national structure, and the residual is an allocation effect:

$$D_{ij} = N_{ij} + M_{ij} + C'_{ij} + A_{ij} \quad (6)$$

with $C'_{ij} = E^*_{ij} (r_{ij} - r_{in})$ and $A_{ij} = (E_{ij} - E^*_{ij})(r_{ij} - r_{in})$. The allocation effect is positive when the region is specialized in a sector in which it also possesses a competitive advantage.

Modified Overlay Analysis

Overlay analysis is conventionally implemented by combining four signs, a synthesis also used in the closest regional study (Maswardani et al., 2025): contribution (LQ), growth (RP_s), specialization ($E_{ij} - E^*_{ij}$), and competitive advantage ($r_{ij} - r_{in}$). Applied to one window, these criteria are not independent. Since $E_{ij} - E^*_{ij} = E_j (E_{in} / E_n)(LQ_{ij} - 1)$, specialization duplicates contribution; and since $RP_s = r_{ij} / r_{in}$, $RP_s > 1$ is equivalent to $r_{ij} - r_{in} > 0$ whenever $r_{in} > 0$, which holds for all 17 national sectors in 2016–2025. At most four of sixteen patterns are thus attainable, and three occur here. The

Table 3. Decision Rules of the Modified Overlay Analysis

No	c: mean LQ	d: DLQ	m: RPr	s: RPs	Classification
1	> 1	> 1	> 1	> 1	Leading (nationally dynamic industry)
2	> 1	> 1	< 1	> 1	Leading (nationally slow industry)
3	< 1	> 1	> 1	> 1	Potential (rising star)
4	< 1	> 1	< 1	> 1	Potential (regionally driven)
5	any	< 1	> 1	< 1	Lagging (nationally dynamic industry)
6	any	< 1	< 1	< 1	Lagging (nationally slow industry)
7	any	> 1	any	< 1	Marginal (not classified)
8	any	< 1	any	> 1	Marginal (not classified)

Note: Cell entries state the condition on the underlying indicator. Rows 7 and 8 cover sectors whose trajectory and competitiveness signs diverge; these satisfy no rule and are reported as marginal.

modified overlay uses four non-redundant criteria: concentration (mean LQ > 1), trajectory (DLQ > 1), national dynamism ($RP_r > 1$, equivalent to $M_{ij} > 0$), and regional competitiveness ($RP_s > 1$, equivalent to $C_{ij} > 0$). A sector positive on concentration, trajectory, and competitiveness is leading; a non-base sector positive on trajectory and competitiveness is potential, either a rising star (positive national dynamism) or regionally driven; sectors negative on trajectory and competitiveness are lagging.

The conventional set places mining alone, ten non-base sectors in a second cell, and six in a third. The modified set splits the ten into three rising stars and seven regionally driven sectors, and the six into four sectors lagging within nationally dynamic industries, one lagging within a nationally slow industry, and one marginal case. It is a strict refinement: 30 of the 60 sector pairs sharing a conventional cell are separated, and 16 of the 17 industries receive a classification the conventional set cannot express.

The decision rules combine the four-quadrant LQ–DLQ classification of Kuncoro (2012) with the growth-ratio classification of the Growth Ratio Model (Muljarjadi, 2011; Yusuf, 1999), and are set out in full in Table 3. Let c, d, m, and s equal one when mean LQ, DLQ, RP_r , and RP_s exceed 1, respectively, and zero otherwise.

Sectors with opposite d and s signs are reported as marginal. Three elements are researcher-defined rather than taken from the literature: requiring a leading sector to be competitive, dividing potential sectors by national dynamism, and the marginal category itself.

The criteria enter unweighted as binary signs, so the classification is a sign pattern, not a composite score or ranking.

Non-redundancy is algebraic, not statistical. Empirically, the DLQ and RP_s are strongly correlated ($r = 0.989$; signs agree in 16 of 17 sectors), so most additional resolution comes from RP_r , which correlates weakly with the others (r between -0.33 and -0.40). The classification has also not been validated against any outcome; the overlay is a descriptive sorting device.

Two checks address sectors near the unit threshold. First, a ± 0.05 buffer flags seven sectors: water supply, construction, and trade on RP_r ; manufacturing, information and communication, and other services on the DLQ; and financial services on RP_r and RP_s . Second, every sector is reclassified with unity replaced by 0.95 and 1.05. Classifications resting on near-unit values are treated as provisional.

Result and Discussion

Two conventions apply. First, *leading* (*sektor unggulan*), *mainstay* (*sektor andalan*), *potential*, and *lagging* are statistical labels for sign patterns, not development priorities or rankings by employment, social value, or fiscal return; their translation into priorities is made in the Discussion. Second,

sub-period names are descriptive labels for calendar windows, not causal claims.

Location Quotient and Dynamic LQ

Mining and quarrying is the only base sector, with a mean LQ of 6.01 (Table 4), about six times its national share, and an annual LQ between 5.69 and 6.26 (SD 0.17). Manufacturing follows at 0.93, never reaching unity, and no other sector averages 0.90. Trends are directional: trade rises in all nine annual steps (0.365 to 0.477), and construction from 0.661 to 0.871, while manufacturing drifts from 0.963 to 0.931. No sector crosses unity during 2016–2025.

Mining's DLQ (1.07) places it in Quadrant I (*sektor unggulan*). Eleven sectors fall in Quadrant III (*sektor andalan*), led by electricity and gas (1.64), construction (1.32), and trade (1.30), and five in Quadrant IV (*sektor terbelakang*): manufacturing, transportation and storage, information and communication, business activities, and other services. Quadrant II is empty. Momentum is not convergence: extrapolating relative-share gains, only construction reaches unity within a decade (9 years), water supply needs about 21 years, and five sectors, including electricity and gas, need half a century or more. The leading label of mining is likewise a statistical quadrant name, not a priority, because its industry grows below the national average ($RP_r = 0.524$) and its competitive component reverses on final data. On the 2016–2023 window, all quadrant memberships are unchanged.

Growth Ratio Model

RP_r compares each sector's national growth with total national growth, and RP_s compares its regional growth with its national growth (Table 5).

Three sectors are dominant-growth sectors: water supply and waste management ($RP_r = 1.031$; $RP_s = 1.623$), accommodation and food service activities (1.342; 1.379), and human health and social work activities (2.054; 1.297). Eight grow prominently in the region despite below-average national growth ($RP_r < 1$, $RP_s > 1$): agriculture, mining and quarrying, electricity and gas (highest RP_s , 2.994), construction, trade, real estate, public administration, and education services. Transportation and storage, information and communication, business activities, and other services show the opposite pattern, and manufacturing and financial services are prominent at neither level. On final data only mining, real estate, and financial services shift.

Classic Shift-Share

GRDP increased by IDR 157,656.80 billion over 2016–2025, from IDR 439,003.84 billion to IDR 596,660.64 billion (Table 6). National growth (42.93%) alone would have added IDR 188,458.29 billion (N_{ij}). The industry-mix component is strongly negative (–IDR 45,652.69 billion), with –IDR 43,421.82 billion from mining alone, whereas the competitive component is positive (+IDR 14,851.20 billion).

Construction records the largest competitive gain (IDR 10,558.27 billion), followed by trade (IDR 7,531.72 billion) and

Table 4. Average LQ with Dispersion, DLQ, and Quadrant Classification of East Kalimantan Province in 2016–2025

No	Economic Sector	Mean LQ 2016–2025	SD	Min–Max	DLQ	Quadrant
1	Agriculture, Forestry, and Fishing	0.52	0.014	0.49–0.54	1.10	III – Mainstay
2	Mining and Quarrying	6.01	0.166	5.69–6.25	1.07	I – Leading
3	Manufacturing	0.93	0.029	0.86–0.96	0.97	IV – Underdeveloped
4	Electricity and Gas	0.06	0.010	0.05–0.08	1.64	III – Mainstay
5	Water Supply; Sewerage, Waste Management, and Remediation Activities	0.59	0.041	0.55–0.69	1.25	III – Mainstay
6	Construction	0.76	0.088	0.66–0.90	1.32	III – Mainstay
7	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	0.42	0.033	0.37–0.48	1.30	III – Mainstay
8	Transportation and Storage	0.69	0.033	0.65–0.74	0.93	IV – Underdeveloped
9	Accommodation and Food Service Activities	0.28	0.016	0.25–0.30	1.19	III – Mainstay
10	Information and Communication	0.29	0.005	0.28–0.29	0.96	IV – Underdeveloped
11	Financial and Insurance Activities	0.36	0.022	0.34–0.40	1.05	III – Mainstay
12	Real Estate Activities	0.29	0.009	0.28–0.31	1.09	III – Mainstay
13	Business Activities	0.10	0.004	0.09–0.11	0.89	IV – Underdeveloped
14	Public Administration and Defence; Compulsory Social Security	0.52	0.050	0.48–0.63	1.25	III – Mainstay
15	Education	0.47	0.029	0.42–0.51	1.22	III – Mainstay
16	Human Health and Social Work Activities	0.52	0.036	0.47–0.56	1.20	III – Mainstay
17	Other Services Activities	0.29	0.006	0.28–0.30	0.98	IV – Underdeveloped

Source: BPS (Statistics Indonesia and East Kalimantan Province), processed.

Table 5. Results of GRM Analysis of East Kalimantan Province in 2016–2025

No	Economic Sector	RP _r	Sign	RP _s	Sign	Classification
1	Agriculture, Forestry, and Fishing	0.638	(–)	1.206	(+)	3 – Potential (regional)
2	Mining and Quarrying	0.524	(–)	1.090	(+)	3 – Potential (regional)
3	Manufacturing	0.856	(–)	0.698	(–)	4 – Low growth
4	Electricity and Gas	0.903	(–)	2.994	(+)	3 – Potential (regional)
5	Water Supply; Sewerage, Waste Management, and Remediation Activities	1.031	(+)	1.623	(+)	1 – Dominant growth
6	Construction	0.972	(–)	1.858	(+)	3 – Potential (regional)
7	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	0.963	(–)	1.823	(+)	3 – Potential (regional)
8	Transportation and Storage	1.747	(+)	0.780	(–)	2 – Prominent nationally
9	Accommodation and Food Service Activities	1.342	(+)	1.379	(+)	1 – Dominant growth
10	Information and Communication	2.444	(+)	0.839	(–)	2 – Prominent nationally
11	Financial and Insurance Activities	0.998	(–)	0.990	(–)	4 – Low growth
12	Real Estate Activities	0.713	(–)	1.145	(+)	3 – Potential (regional)
13	Business Activities	1.683	(+)	0.637	(–)	2 – Prominent nationally
14	Public Administration and Defence; Compulsory Social Security	0.721	(–)	1.741	(+)	3 – Potential (regional)
15	Education	0.769	(–)	1.661	(+)	3 – Potential (regional)
16	Human Health and Social Work Activities	2.055	(+)	1.297	(+)	1 – Dominant growth
17	Other Services Activities	2.034	(+)	0.859	(–)	2 – Prominent nationally

Source: BPS (Statistics Indonesia and East Kalimantan Province), processed.

mining (IDR 4,330.02 billion); eleven sectors post a positive C_{ij} . The largest losses are in manufacturing (–IDR 10,387.37 billion), transportation and storage (–IDR 2,047.14 billion), and information and communication (–IDR 1,096.34 billion). The sign is robust to excluding preliminary data for 14 of the 17 sectors; notably, the competitive component of mining is negative on final data through 2023 (–IDR 1,829.58 billion).

Sub-Period Decomposition

Table 7 repeats the decomposition by sub-period. The aggregate competitive component moves from +IDR 3,623.13 billion (2016–2019) to –IDR 9,996.19 billion (2019–2022) and +IDR 22,098.60 billion (2022–2025), so the full-period gain arises in the final three years. That rebound coincides with the new-capital window but also with post-pandemic recovery, the commodity cycle, and fiscal expansion, which the design

cannot separate. The gain is also narrow: six sectors supply 94.7% of it, and mining's share rests on a differential of only 1.65 percentage points.

Three sector details stand out. First, construction's gain builds across the sub-periods (IDR 551.23, 3,441.19, and 5,895.31 billion), predating the new-capital window; without a comparison region, this is an association, not an effect of the relocation. Second, trade, education, electricity and gas, and accommodation are competitive in all three sub-periods, but only trade and education in every alternative partition, and they differ greatly in weight (6.50%, 1.54%, 0.08%, and 1.04% of GRDP in 2025, respectively). Third, mining swings from +12,352.22 to –12,760.41 and back to +3,901.39 billion, while manufacturing moves from –IDR 9,012.83 billion in 2016–2019 to +IDR 3,110.80 billion in 2022–2025,

Table 6. Classic Shift-Share Analysis of East Kalimantan Province, 2016–2025 (in IDR Billion)

No	Economic Sector	N _{ij}	M _{ij}	C _{ij}	D _{ij}
1	Agriculture, Forestry, and Fishing	12,294.50	-4,454.63	1,615.15	9,455.02
2	Mining and Quarrying	91,287.55	-43,421.82	4,330.02	52,195.75
3	Manufacturing	40,241.56	-5,814.78	-10,387.37	24,039.40
4	Electricity and Gas	95.90	-9.33	172.64	259.22
5	Water Supply; Sewerage, Waste Management, and Remediation Activities	86.60	2.66	55.63	144.89
6	Construction	12,668.43	-356.70	10,558.27	22,870.00
7	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	9,499.70	-349.21	7,531.72	16,682.21
8	Transportation and Storage	5,316.43	3,972.51	-2,047.14	7,241.80
9	Accommodation and Food Service Activities	1,486.91	508.66	755.70	2,751.28
10	Information and Communication	2,783.41	4,018.52	-1,096.34	5,705.59
11	Financial and Insurance Activities	2,821.68	-6.39	-28.33	2,786.96
12	Real Estate Activities	1,675.03	-480.43	173.04	1,367.64
13	Business Activities	354.01	241.67	-216.22	379.46
14	Public Administration and Defence; Compulsory Social Security	3,364.63	-938.28	1,799.00	4,225.35
15	Education	2,545.35	-588.01	1,294.48	3,251.82
16	Human Health and Social Work Activities	998.44	1,052.86	609.92	2,661.22
17	Other Services Activities	938.17	970.00	-268.98	1,639.19
	Total GRDP	188,458.29	-45,652.69	14,851.20	157,656.80

Source: BPS (Statistics Indonesia and East Kalimantan Province), processed.

Table 7. Competitive Component (C_{ij}) by Sub-Period, East Kalimantan Province (in IDR Billion)

No	Economic Sector	C _{ij} 2016–2019	C _{ij} 2019–2022	C _{ij} 2022–2025	C _{ij} 2016–2025
1	Agriculture, Forestry, and Fishing	1,323.31	-1,648.60	1,879.10	1,615.15
2	Mining and Quarrying	12,352.22	-12,760.41	3,901.39	4,330.02
3	Manufacturing	-9,012.83	-2,243.56	3,110.80	-10,387.37
4	Electricity and Gas	35.79	24.40	100.43	172.64
5	Water Supply; Sewerage, Waste Management, and Remediation Activities	-2.49	10.36	47.53	55.63
6	Construction	551.23	3,441.19	5,895.31	10,558.27
7	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	1,536.57	1,522.07	3,872.09	7,531.72
8	Transportation and Storage	-1,084.61	328.32	-953.20	-2,047.14
9	Accommodation and Food Service Activities	258.20	42.89	355.42	755.70
10	Information and Communication	-571.44	-184.63	47.27	-1,096.34
11	Financial and Insurance Activities	-733.08	566.33	219.51	-28.33
12	Real Estate Activities	-132.32	-193.31	533.64	173.04
13	Business Activities	-152.66	8.79	-25.03	-216.22
14	Public Administration and Defence; Compulsory Social Security	-686.31	280.89	2,270.53	1,799.00
15	Education	149.50	411.91	666.60	1,294.48
16	Human Health and Social Work Activities	-61.61	457.97	155.84	609.92
17	Other Services Activities	-146.34	-60.79	21.37	-268.98
	Total C _{ij}	3,623.13	-9,996.19	22,098.60	14,851.20

Source: BPS (Statistics Indonesia and East Kalimantan Province), processed.

consistent with recent processing investment.

Esteban-Marquillas Modified Shift-Share

The modified competitive effect totals IDR 35,449.60 billion and the allocation effect -IDR 20,598.40 billion (Table 8). Mining alone has a clearly positive allocation effect (IDR 3,568.93 billion). Construction (C_{ij} = IDR 15,970.34 billion) and trade (IDR 20,624.10 billion) have the largest pure competitive advantages but negative allocation effects (-IDR 5,412.07 billion and -IDR 13,092.38 billion) because the province is not specialized in them. This is an accounting statement, not evidence that expansion would be efficient, and forced specialization in cyclical, publicly funded sectors would exchange one dependence for another. Positive allocation values in transportation, information and

communication, business activities, and other services reflect an avoided loss, not a strength. Manufacturing records a modified competitive effect of -IDR 10,784.35 billion.

Modified Overlay Analysis

Table 9 yields six distinct patterns, against three under the conventional overlay. Mining shows (+, +, -): leading in the mechanical sense of Table 3, but in a nationally slow industry, which is why that status is fragile. Water supply, accommodation and food services, and health services are rising stars. Seven sectors are regionally driven potential sectors (-, +, -, +): agriculture, electricity and gas, construction, trade, real estate, public administration, and education services. Financial services is marginal (-, +, -, -). Transportation and storage, information and communication,

Table 8. Esteban-Marquillas Modified Shift-Share Analysis of East Kalimantan Province, 2016–2025 (in IDR Billion)

No	Economic Sector	N_{ij}	M_{ij}	C_{ij}	A_{ij}	D_{ij}
1	Agriculture, Forestry, and Fishing	12,294.50	-4,454.63	3,295.45	-1,680.30	9,455.02
2	Mining and Quarrying	91,287.55	-43,421.82	761.09	3,568.93	52,195.75
3	Manufacturing	40,241.56	-5,814.78	-10,784.35	396.98	24,039.40
4	Electricity and Gas	95.90	-9.33	3,729.47	-3,556.82	259.22
5	Water Supply; Sewerage, Waste Management, and Remediation Activities	86.60	2.66	101.60	-45.97	144.89
6	Construction	12,668.43	-356.70	15,970.34	-5,412.07	22,870.00
7	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	9,499.70	-349.21	20,624.10	-13,092.38	16,682.21
8	Transportation and Storage	5,316.43	3,972.51	-2,989.93	942.79	7,241.80
9	Accommodation and Food Service Activities	1,486.91	508.66	2,977.58	-2,221.88	2,751.28
10	Information and Communication	2,783.41	4,018.52	-3,746.82	2,650.47	5,705.59
11	Financial and Insurance Activities	2,821.68	-6.39	-78.67	50.34	2,786.96
12	Real Estate Activities	1,675.03	-480.43	598.13	-425.09	1,367.64
13	Business Activities	354.01	241.67	-2,015.76	1,799.54	379.46
14	Public Administration and Defence; Compulsory Social Security	3,364.63	-938.28	3,543.89	-1,744.89	4,225.35
15	Education	2,545.35	-588.01	3,096.09	-1,801.61	3,251.82
16	Human Health and Social Work Activities	998.44	1,052.86	1,296.92	-687.00	2,661.22
17	Other Services Activities	938.17	970.00	-929.51	660.54	1,639.19
	Total GRDP	188,458.29	-45,652.69	35,449.60	-20,598.40	157,656.80

Source: BPS (Statistics Indonesia and East Kalimantan Province), processed.

Table 9. Modified Overlay Analysis of East Kalimantan Province in 2016–2025

No	Economic Sector	LQ	DLQ	RP_r	RP_s	Classification
1	Agriculture, Forestry, and Fishing	-	+	-	+	Potential (regionally driven)
2	Mining and Quarrying	+	+	-	+	Leading (nationally slow industry)
3	Manufacturing	-	-	-	-	Lagging
4	Electricity and Gas	-	+	-	+	Potential (regionally driven)
5	Water Supply; Sewerage, Waste Management, and Remediation Activities	-	+	+	+	Rising star
6	Construction	-	+	-	+	Potential (regionally driven)
7	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	-	+	-	+	Potential (regionally driven)
8	Transportation and Storage	-	-	+	-	Lagging (dynamic industry)
9	Accommodation and Food Service Activities	-	+	+	+	Rising star
10	Information and Communication	-	-	+	-	Lagging (dynamic industry)
11	Financial and Insurance Activities	-	+	-	-	Marginal
12	Real Estate Activities	-	+	-	+	Potential (regionally driven)
13	Business Activities	-	-	+	-	Lagging (dynamic industry)
14	Public Administration and Defence; Compulsory Social Security	-	+	-	+	Potential (regionally driven)
15	Education	-	+	-	+	Potential (regionally driven)
16	Human Health and Social Work Activities	-	+	+	+	Rising star
17	Other Services Activities	-	-	+	-	Lagging (dynamic industry)

Source: BPS (Statistics Indonesia and East Kalimantan Province), processed. Note: LQ = concentration (mean LQ > 1); DLQ = trajectory (DLQ > 1); RP_r = national dynamism (equivalent to $M_{ij} > 0$); RP_s = regional competitiveness (equivalent to $C_{ij} > 0$).

business activities, and other services lag despite nationally dynamic industries (-, -, +, -), a descriptive label that does not attribute cause. Manufacturing is negative on all four criteria.

Between the full and final-data windows, three marginal sectors move: the RP_r of mining falls from 1.090 to 0.951 and its competitive component from +IDR 4,330.02 billion to -IDR 1,829.58 billion; that of real estate falls from 1.145 to 0.767, making it a low-growth sector; and financial services moves from marginal to dominant-growth. All other classifications hold.

Under the 0.95 and 1.05 cut-offs (Table 10), ten sectors keep an identical label and 13 the same broad category; mining is leading at every cut-off, given its mean LQ of 6.011.

The seven sectors that move are those flagged as near-unit. Water supply loses its rising-star sub-label at 1.05, while construction and trade gain it at 0.95, all three remaining potential sectors.

Manufacturing, information and communication, and other services become marginal at 0.95, and financial services becomes a rising star at 0.95.

Hence the base status of mining is independent of threshold and window, whereas its leading sub-label does not survive the exclusion of preliminary data. Lagging is the least secure category, held at every cut-off only by transportation and storage. Eleven of the 17 sectors keep their broad category under both checks.

Table 10. Sector Classification under Alternative Overlay Thresholds, East Kalimantan Province, 2016–2025

No	Economic Sector	Cut-off 0.95		Cut-off 1.00 (baseline)		Cut-off 1.05		Label stable
1	Agriculture, Forestry, and Fishing	Potential (regionally driven)	(regionally driven)	Potential (regionally driven)	(regionally driven)	Potential (regionally driven)	(regionally driven)	Yes
2	Mining and Quarrying	Leading (nationally slow industry)	(nationally slow industry)	Leading (nationally slow industry)	(nationally slow industry)	Leading (nationally slow industry)	(nationally slow industry)	Yes
3	Manufacturing	Marginal		Lagging		Lagging		No
4	Electricity and Gas	Potential (regionally driven)	(regionally driven)	Potential (regionally driven)	(regionally driven)	Potential (regionally driven)	(regionally driven)	Yes
5	Water Supply; Sewerage, Waste Management, and Remediation Activities	Rising star		Rising star		Potential (regionally driven)	(regionally driven)	Sub-label
6	Construction	Rising star		Potential (regionally driven)	(regionally driven)	Potential (regionally driven)	(regionally driven)	Sub-label
7	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	Rising star		Potential (regionally driven)	(regionally driven)	Potential (regionally driven)	(regionally driven)	Sub-label
8	Transportation and Storage	Lagging (dynamic industry)	(dynamic industry)	Lagging (dynamic industry)	(dynamic industry)	Lagging (dynamic industry)	(dynamic industry)	Yes
9	Accommodation and Food Service Activities	Rising star		Rising star		Rising star		Yes
10	Information and Communication	Marginal		Lagging (dynamic industry)	(dynamic industry)	Lagging (dynamic industry)	(dynamic industry)	No
11	Financial and Insurance Activities	Rising star		Marginal		Marginal		No
12	Real Estate Activities	Potential (regionally driven)	(regionally driven)	Potential (regionally driven)	(regionally driven)	Potential (regionally driven)	(regionally driven)	Yes
13	Business Activities	Lagging (dynamic industry)	(dynamic industry)	Lagging (dynamic industry)	(dynamic industry)	Lagging (dynamic industry)	(dynamic industry)	Yes
14	Public Administration and Defence; Compulsory Social Security	Potential (regionally driven)	(regionally driven)	Potential (regionally driven)	(regionally driven)	Potential (regionally driven)	(regionally driven)	Yes
15	Education	Potential (regionally driven)	(regionally driven)	Potential (regionally driven)	(regionally driven)	Potential (regionally driven)	(regionally driven)	Yes
16	Human Health and Social Work Activities	Rising star		Rising star		Rising star		Yes
17	Other Services Activities	Marginal		Lagging (dynamic industry)	(dynamic industry)	Lagging (dynamic industry)	(dynamic industry)	No

Source: BPS (Statistics Indonesia and East Kalimantan Province), processed. Note: each column re-applies the decision rules of Table 3 with the unit cut-off replaced by the value shown, applied to all four criteria simultaneously; the 1.00 column reproduces Table 9. Label stable = Yes where the label is identical under all three cut-offs, Sub-label where only the rising-star versus regionally driven distinction moves, and No where the broad category changes.

Four results depend on the preliminary 2024–2025 figures: the positive full-period competitive component of mining, its regional-growth classification in the GRM, the potential status of real estate, and the marginal position of financial services. They remain provisional until BPS publishes final figures; all other results hold on the 2016–2023 window.

The discussion distinguishes three kinds of statement: empirical findings, measured directly by the instruments; plausible mechanisms, consistent with those findings but untested, since the design observes no factor movements, prices, wages, linkages, or firm behavior; and policy hypotheses, conditional propositions offered for appraisal. Only the first is supported by this evidence.

Diversification here means a fall in the concentration of output across the 17 industries, measured by a Herfindahl or entropy index, with more industries above unity LQ. Genuine structural change also requires rising non-mining tradable employment, deeper intersectoral linkages, and higher non-mining productivity; this study measures only the first condition.

Interpretation of Key Findings

Three points stand out. First, mining is both the main

strength and the main vulnerability of the province: base, specialized, and competitive over the full window, yet the source of almost the entire negative industry-mix effect, with a competitive sign that reverses on final data and output that contracted in 2025, so a downturn in coal and gas markets would transmit directly to regional income. Second, trade, education, electricity and gas, and accommodation were competitive before, during, and after the pandemic, whereas the gains of construction, public administration, and real estate are concentrated in 2022–2025 and remain contingent on new-capital spending. Third, manufacturing, the second-largest sector, lost competitiveness over the full period. A Dutch-disease reading is one plausible mechanism, since the sector is dominated by the processing of oil, gas, and palm oil, and a booming extractive sector tends to squeeze other tradables (Corden & Neary, 1982). This is an untested hypothesis, not a finding: shift-share observes neither factor movements nor relative-price channels, and the differential is equally consistent with scale, input-cost, or market-access explanations. The timing is only circumstantial support: the loss of manufacturing peaked in 2016–2019, when the gain of mining was largest, but both turned positive in 2022–2025, and manufacturing weakened while the mining share fell, so the evidence describes the structure without identifying the

mechanism.

Implications for the RPJMD of East Kalimantan 2025–2029

The RPJMD 2025–2029 is the first five-year stage of the Regional Long-Term Development Plan (RPJPD) 2025–2045, established by Regional Regulation Number 11 of 2024, which projects the province as the economic superhub of the new capital. Its vision is pursued through six missions, four priorities, and two flagship programs: Gratispol, which provides free education up to the doctoral level and free health services, and Jospol, directed at industrial downstreaming, MSME and creative-economy empowerment, village-based tourism, and food security.

The evidence maps onto the four priorities. The education and health priorities, funded through Gratispol, channel demand into sectors with strong records: education services is competitive in every sub-period, and health services is a dominant-growth sector ($RPr = 2.054$; $RP_s = 1.297$) and a rising star. The quality-infrastructure priority operates through construction, the sector with the largest competitive gain; the sub-period decomposition shows that this gain predates the new-capital window while its largest increment coincides with it, an association the design cannot attribute to the relocation; fiscal policy is a significant driver of the province's construction growth (Lubis et al., 2025), and the sector's flat 2025 output indicates that whether construction crosses into base-sector status depends on sustaining public investment after the initial new national capital construction wave. The inclusive-economy priority and Jospol address sectors in which competitiveness has not yet translated into specialization, such as trade, accommodation and food services, and agriculture. Recent work on the buffer regencies highlights both the opportunities and the frictions in these activities, from farmer terms of trade in the new-capital area (Sihite et al., 2026) and nature-based tourism in the province's forests (Edwin et al., 2017) to the readiness of local micro- and small enterprises to serve the new capital (Hasiara et al., 2025).

The clearest lever is to relieve the industry-mix drag at its source: mining generates almost the entire negative industry-mix effect (−IDR 45,652.69 billion), and no within-sector competitiveness can offset a base anchored in a slow-growing national market. Vertical integration is the natural route, and manufacturing's competitive component already turned positive in the new-capital sub-period. The decomposition shows where the largest structural gain lies, not which activities should deliver it; channeling Jospol downstreaming into coal gasification, gas-based petrochemicals, and palm-oil oleochemicals is an illustrative policy hypothesis. Its premise, that domestic processing generates forward and backward linkages which raw extraction does not, is drawn from the input-output evidence for the province (Randa et al., 2025) and not from the indicators computed here, which measure concentration and relative growth and cannot observe linkages at all.

Adopting these options would first require evidence on feasibility and markets, labor, productivity, emissions, and transition risk, since long-lived carbon-intensive assets face stranded-asset exposure under Indonesia's net-zero commitment. A coal-based downstreaming agenda also sits awkwardly beside the plan's sustainable-development mission, so it is a direction worth testing, not a conclusion.

A second lever concerns construction. Its competitive gain rose from IDR 551.23 billion in 2016–2019 to IDR 5,895.31 billion in 2022–2025, yet output was flat in 2025 (−0.17%), so its competitiveness is contingent on a public-investment pulse. Steering that pulse toward road, port, and airport links between the new capital, Balikpapan, and Samarinda could leave durable connectivity, a hypothesis testable with freight-cost data. On the concentration criterion the province did

diversify, as the Herfindahl index fell from 0.294 to 0.255, but this rests on fiscal dependence, so durable diversification requires the stimulus to seed tradable activities such as processing, trade, and tourism.

A third lever is the one the province is most tempted to defer. Its only base sector is anchored in coal at a time when national and global policy point toward a structural decline in coal demand, and input-output evidence for East Kalimantan indicates that a fall in coal exports transmits to output losses in every other sector (Randa et al., 2025); the 2020 contraction and mining's slight decline in 2025 (−0.11%) are early reminders of that exposure. Treating the sustainable-development mission as separate from the growth agenda misreads that risk: renewable capacity and green industrial clusters hedge the province's own income targets and fit the green-superhub identity of the new capital. That imperative is not new: Balikpapan, the province's oil city, has been planning for a post-oil economy for more than a decade (A. K. M. Tarigan et al., 2017), and the province holds under-exploited renewable options, including biomass and palm-oil-mill effluent, that could support the shift (Aipassa et al., 2018). Gas-based processing can bridge the transition while renewable capacity is scaled.

Human capital connects the economic structure to social targets. Health and social work is a dominant-growth sector and a rising star, and it is the sector through which the first RPJMD mission pursues the reduction of child stunting. The province recorded a stunting prevalence of 22.2% in 2024, above the national figure of 19.8% reported by the 2024 national nutrition survey, and the RPJMD targets a reduction to 14.8% by 2029 (Kementerian Kesehatan Republik Indonesia, 2025). Treating this as a purely social objective understates its economic weight: childhood stunting lowers schooling, cognitive skills, and adult height, and development-accounting estimates place the resulting per-capita income penalty at 5 to 7 percent, with packages of nutrition interventions yielding internal rates of return on the order of 12 percent (Galasso & Wagstaff, 2019). Reducing stunting is thus an investment in the productivity that structural transformation requires, and the flagship program Gratis Hidup Sehat Tanpa Stunting targets the first thousand days of life, where the returns to nutrition concentrate.

Two caveats apply. First, growth targets must be carried mainly by the non-mining economy: with the 2025 mining share (0.4439) held fixed and stagnant mining, an illustrative 5% total-growth benchmark requires non-mining growth of 8.99%, close to the 2025 pace of 8.54%, an arithmetic scenario rather than a forecast. Because mining is also capital-intensive, its dominance in output does not translate proportionally into employment, and leading-sector status matters for welfare mainly through its links to job creation and investment (Soleh & Maryoni, 2017); the potential sectors identified here are considerably more labor-absorbing, though this should be verified with employment data, and aligning the local workforce with the new capital's labor needs is itself a recognized policy challenge (Surahman et al., 2025). Second, the LQ, GRM, and shift-share toolkit can serve as a low-cost annual monitoring instrument.

Conclusion

The analysis identifies the base, potential, and leading sectors of East Kalimantan for 2016–2025. Results that survive the exclusion of preliminary data are mining and quarrying as the single base sector, unchanged quadrant membership for all 17 industries, the competitive-component sign in 14 of 17 sectors, three rising stars (water supply, accommodation and food services, and health services), and the persistent competitiveness of trade and education. The persistent competitiveness of electricity and gas and of accommodation, and the rising-star label of water supply, are weaker. Four results are provisional: the positive competitive component and growth-

ratio classification of mining, the potential status of real estate, and the marginal position of financial services. All are descriptive diagnostics that neither identify causes nor establish that acting on them would improve welfare.

For the RPJMD 2025–2029, the only base sector sits in a nationally slow-growing industry, so within-sector competitiveness cannot sustain growth alone. Jospol downstreaming, construction steered toward connectivity, and renewable energy merit appraisal, each conditional on evidence this study does not supply. Health and education are the most secure strengths.

The contribution is mainly empirical and policy-oriented; the methodological element is integration and correction rather than invention, and no new estimator is proposed. The province has been studied recently by Putra et al. (2025) and by Maswardani et al. (2025); what this study adds is the separation of the pre-pandemic, pandemic, and new-capital windows, which isolates competitiveness that persists across regimes from competitiveness confined to the capital-construction period, and it tests every classification against a final-data window, three alternative sub-period partitions, and four aggregation rules. Methodologically, the modified overlay removes two redundant signs and separates half of the conventionally grouped sector pairs, although its criteria remain empirically correlated. Whether the province has an enclave structure requires input–output and employment evidence.

Ten limitations apply: the LQ assumes uniform productivity and consumption; eight sectors lie within 0.05 of unity on at least one indicator; four results depend on preliminary data; the

sub-period design is descriptive and non-causal; the 17-industry aggregation cannot detect subsector mechanisms or intrasectoral restructuring; no employment, productivity, environmental, or linkage outcome is measured; the provincial unit masks district differences; the sub-period boundaries are imposed; the overlay criteria are empirically correlated; and the classification is unvalidated against outcomes. Recalculating the indicator set as final data become available, extending it with employment and input–output data, and disaggregating to the district level following Maswardani et al. (2025) are the natural next steps. Nevertheless, the core findings hold on final data and across seven LQ specifications, so the preliminary data limit four specific claims rather than the sectoral map as a whole.

Author contributions

The sole author conceived and designed the study, collected and processed the data, conducted the quantitative analysis, interpreted the results, and wrote and revised the manuscript.

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