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Government Fund Transfers and Banking Spillovers: Evidence from Indonesia

Muhammad Fawaiq[1,2*], **Hermanto Siregar**[3], **Dedi Budiman Hakim**[3], **Lukytawati Anggraeni**[3]

[1] *Rural and Regional Development Planning Science, Faculty of Economics and Management, IPB University, Indonesia.*
[2] *Faculty of Economics and Business, Universitas Negeri Jakarta, Indonesia.*
[3] *Department of Economics, Faculty of Economics and Management, IPB University, Indonesia.*

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Abstract

This study aims to analyze the spillover effects of government fund transfers from the central bank to the State-Owned Banks Association. The method employed in this study is the Inter-Regional Input-Output approach. The six provinces simulated in this research, selected based on the Sensitivity Index and their contribution to the national economy, are Jakarta, West Java, East Java, Central Java, Banten, and North Sumatra. The first simulation, with fund placement in Jakarta, resulted in an increase in total national economic output. However, the output growth in this simulation was the lowest compared to simulations in the other five provinces (East Java, West Java, Central Java, Banten, and North Sumatra). The highest increase in national output was observed in the fourth simulation (Sim04), corresponding to fund allocation in Central Java. Regarding inter-provincial spillover effects, Jakarta was among the lowest spillover contributors compared to the other five provinces, whereas Banten was the highest. The findings also indicate a backwash effect, whereby Jakarta absorbs more spillover effects from surrounding regions than it transmits. Therefore, a policy that concentrates fund placement solely in Jakarta should be reconsidered in favor of a more proportionate distribution to other major provinces, particularly in Central Java and Banten.

Abstrak

Penelitian ini bertujuan untuk menganalisis dampak limpahan pemindahan dana pemerintah dari Bank Indonesia ke bank umum milik pemerintah (Himbara). Metode yang digunakan dalam penelitian ini adalah Pendekatan Inter-Regional Input-Output (IRIO). Enam provinsi dipilih berdasarkan Indeks Derajat Kepekaan (IDK) dan kontribusinya pada perekonomian nasional adalah Jakarta, Jawa Barat, Jawa Timur, Jawa Tengah, Banten dan Sumatera Utara. Hasil simulasi pertama menunjukkan bahwa penempatan dana di Jakarta berdampak posisitf pada peningkatan output perekonomian nasional. Namun demikian, nilai peningkatan output tersebut merupakan yang terendah jika dibandingkan dengan hasil simulasi penempatan dana di setiap perekonomian lima provinsi lainnya (Jawa Timur, Jawa Barat, Jawa Tengah, Banten, dan Sumatra Utara). Potensi peningkatan output nasional tertinggi diperoleh dari hasil simulasi ke empat atau simulasi penempatan dana di Jawa Tengah. Terkait dampak spillover antar provinsi, Jakarta termasuk pengirim spillover terendah dibandingkan lima provinsi lainnya atau terjadi backwash effect antara pusat dan daerah. Adapun Banten merupakan pengirim spillover tertinggi. Untuk itu, kebijakan penempatan dana yang cenderung hanya di Jakarta dapat dipertimbangkan untuk diperluas pendistribusiannya ke provinsi besar lainnya secara proporsional terutama di Jawa Tengah dan Banten.

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* Corresponding Author.
fawaiqmuhammad@apps.ipb.ac.id. Muhammad Fawaiq

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INTRODUCTION

The policy of the Minister of Finance concerning the transfer of government funds from Bank Indonesia to banks affiliated with the State-Owned Banks Association (Himbara), as regulated under Minister of Finance Decree Number 276 of 2025 (KMK 276) (Ministry of Finance, 2025), represents a strategic fiscal initiative with potential implications for both national and regional economic production. Beyond merely reallocating government deposits, the policy may influence liquidity distribution within the financial system, thereby affecting investment, consumption, and production activities across sectors. In the context of Indonesia's vast archipelagic economy and persistent regional disparities between the primary economic center in the Special Capital Region of Jakarta and other provinces, such liquidity redistribution may strengthen interregional economic connectivity and potentially reduce spatial inequality.

A recurring issue in Indonesia's regional economic policy is the concentration of financial resources and government expenditure in Jakarta, which creates a phenomenon commonly referred to as capital city bias. Government spending concentrated in national capitals tends to reinforce regional dominance in access to financing and economic opportunities (Quistorff, 2015). Since financial institutions and large corporations remain largely concentrated in Jakarta, the transfer of government funds through Himbara may unintentionally deepen spatial disparities if liquidity expansion is not distributed more broadly across regions. Therefore, understanding how fiscal liquidity spreads spatially becomes an important policy concern. From a regional economic perspective, government funds managed through banking institutions are expected to stimulate credit expansion toward productive sectors across multiple regions. However, spatial concentration of liquidity may reinforce economic agglomeration. According to Krugman (1991), economic activity tends to cluster in regions with strong demand and industrial linkages. This implies that financial shocks introduced in one region may generate unequal multiplier effects across provinces. Spatial considerations are therefore essential when evaluating fiscal policies, particularly as several provincial economies in Indonesia have recently experienced rapid development and require broader investment distribution to support balanced national growth.

Recent literature highlights the changing relationship between monetary policy and liquidity creation. The traditional money multiplier framework has weakened, and the endogeneity of money has become increasingly recognized. Li et al. (2020) argue from the perspective of Modern Monetary Theory that money creation is strongly influenced by fiscal policy rather than solely by bank lending demand. Empirical evidence from Japan shows that money supply behaves endogenously and that the money multiplier is unstable, limiting the central bank's ability to control liquidity exogenously (Ongan and Gocer, 2023). Similarly, unconventional monetary policies such as quantitative easing may have limited effects on broad money growth when liquidity remains stored as bank reserves (Pateiro Rodríguez et al., 2025). These findings emphasize the importance of fiscal channels, including government fund transfers, in stimulating economic activity.

Several studies also demonstrate that monetary policy alone is often insufficient to promote sustained economic growth under structural constraints. Interest rate increases may generate contractionary effects, while demographic factors and large informal sectors weaken policy transmission mechanisms (Azuh et al., 2021). External shocks such as commodity price fluctuations may exert stronger macroeconomic impacts than monetary instruments themselves (Olamide et al., 2022). Consequently, fiscal expansion plays an important complementary role in improving liquidity transmission to the real sector. However, most existing studies examine these mechanisms from a macroeconomic perspective and provide limited discussion of spatial transmission across regions.

Regional differences in industrial structures and intersectoral connectivity may produce heterogeneous impacts of fiscal policy across provinces. Fiscal multipliers vary depending on regional development levels and economic structures (Ilzetzki et al., 2013). Despite this, spatial analyses examining how increases in government funds influence both regional and national output remain limited in Indonesia. The government funds analyzed in this study originate from the Budget Surplus Balance, which represents unused state revenues deposited at Bank Indonesia and allocated through the Over the Counter (OTC) transaction mechanism. This mechanism allows

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flexibility in determining the sectors or regions receiving the funds. Without spatial evaluation, such allocation decisions risk reinforcing capital city bias.

To analyze spatial transmission mechanisms, an analytical framework capable of capturing intersectoral and interregional economic relationships is required. The Interregional Input Output (IRIO) model provides an appropriate analytical tool because it maps flows of goods and services both within and between provinces. Unlike conventional input output tables, the IRIO framework captures interregional trade linkages and allows shocks occurring in one region to propagate to other regions through production networks (Miller and Blair, 2009). Studies show that strong sectoral connectivity within input output networks contributes to increases in national output through spillover mechanisms (Fadinger et al., 2022).

A growing body of research applies IRIO and Multi Regional Input Output approaches to analyze spatial spillover effects. Shibusawa et al. (2019) estimate regional multipliers in Japan and reveal complex interregional dependencies among industries. Shibusawa and Matsushima (2022) demonstrate how shocks propagate through supply chains using a dynamic IRIO model. Patandianan and Shibusawa (2020) show heterogeneous regional spillovers following tourism decline after disasters, while Ortiz et al. (2021) identify spatial spillovers driven by agglomeration effects in the hotel sector. Research using MRIO methods also identifies spatial production patterns in the electricity sector in China (Lu and Chen, 2025) and spillover effects of transportation shocks on economic growth and employment in Tunisia (Daldoul and Dakhlaoui, 2025). At the global level, MRIO analysis reveals how international trade linkages generate spillover and feedback effects influencing emissions relocation and economic control structures (Banerjee, 2025; Liu and Xing, 2025).

In Indonesia, several studies have applied the IRIO framework to evaluate regional economic policies. Carbon tax simulations indicate uneven revenue distribution concentrated in Java (Kamil et al., 2023). Marine economic analysis identifies differing provincial leading sectors and demand contributions (Gani et al., 2022). Nickel downstreaming policies increase manufacturing multipliers but generate spillovers toward other provinces due to weak local integration (Fitrianto et al., 2025). Studies on information and communication technology and electricity interactions show strong inter island dependence, particularly between Java and Sumatra (Rosmika et al., 2022). Although these studies demonstrate the usefulness of IRIO analysis, they primarily focus on sectoral or environmental policies rather than liquidity based fiscal shocks.

Previous studies indicate that liquidity creation is increasingly influenced by fiscal policy, while various IRIO and MRIO studies have found that interregional production linkages generate heterogeneous spillover effects across regions. However, research on liquidity-based fiscal shocks and the bidirectional spillover relationship between core and semi-peripheral regions arising from government fund placement policies remains very limited, particularly in the Indonesian context. Therefore, the theoretical gap addressed by this study concerns the bidirectional spillover relationship between core regions, which have traditionally been the primary focus of government fund placement policies, and semi-peripheral regions. From a policy perspective, this study offers an alternative spatial policy framework for government fund placement, which has generally been concentrated in Special Capital Region of Jakarta (Jakarta).

METHOD

The data used in this study are secondary data obtained from the latest Interregional Input–Output (IRIO) Table of Indonesia published by BPS–Statistics Indonesia (Statistics Indonesia) in 2021, which is based on the structure of the Indonesian economy in 2016. The IRIO table provides comprehensive information on both intersectoral linkages and interregional economic interactions across Indonesia, enabling the analysis of spatial economic impacts resulting from policy interventions. Nevertheless, the IRIO model has several limitations, particularly because the latest available data are still based on the 2016 benchmark year, which may not fully capture recent structural changes in the economy. In addition, the IRIO framework relies on restrictive assumptions, such as fixed input coefficients and the absence of substitution effects. Despite these

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limitations, the IRIO model remains highly useful for analyzing intersectoral and interregional linkages, identifying spillover effects, and estimating regional multiplier impacts arising from changes in final demand. The object of this study focuses on six major provinces in Indonesia, namely the Special Capital Region of Jakarta (Jakarta), East Java Province (Jatim), West Java Province (Jabar), Central Java Province (Jateng), Banten Province (Banten), and North Sumatra Province (Sumut). The selection of these provinces is based on the following criteria.

The selected provinces were determined based on three criteria. First, they rank among the ten provinces contributing most to national economic output and Gross Fixed Capital Formation (GFCF). Second, they have an average Sensitivity Index (IDK) greater than one (IDK > 1), indicating that their economic sectors have relatively strong linkages within the economic system. Third, each of these provinces has at least nine sectors with IDK > 1. Since every province in the IRIO dataset consists of 17 economic sectors, this threshold means that most sectors in these provinces are relatively competitive and influential in both intersectoral and interregional economic linkages. For the purpose of simplifying the presentation in this study, the names of the provinces are abbreviated throughout the text. The list of provincial abbreviations is presented in Table 1.

Table 1. List of Indonesian Province Abbreviations

Province	Abbreviation	Province	Abbreviation
Special Capital Region of Jakarta	Jakarta	Central Sulawesi	Sulteng
West Java	Jabar	West Nusa Tenggara	NTB
East Java	Jatim	Southeast Sulawesi	Sultra
Central Java	Jateng	North Sulawesi	Sulut
North Sumatra	Sumut	Central Kalimantan	Kalteng
Banten	Banten	Jambi	Jambi
South Sumatra	Sumsel	South Kalimantan	Kalsel
South Sulawesi	Sulsel	Special Region of Yogyakarta	Yogya
Riau	Riau	East Nusa Tenggara	NTT
East Kalimantan	Kaltim	North Kalimantan	Kaltara
Riau Islands	Kepri	Bengkulu	Bengkulu
Lampung	Lampung	Bangka Belitung Islands	Babel
West Sumatra	Sumbar	West Papua	Papua Barat
Bali	Bali	West Sulawesi	Sulbar
Papua	Papua	North Maluku	Malut
Aceh (Nanggroe Aceh Darussalam)	Aceh	Gorontalo	Gorontalo
West Kalimantan	Kalbar	Maluku	Maluku

Furthermore, the IRIO table is divided into 17 sectors. The list of these 17 sectors is presented in Table 2.

Table 2. Economic Sectors in IRIO and Their Codes

Sector Name	IRIO Code
Agriculture, Forestry, and Fisheries	A
Mining and Quarrying	B
Manufacturing	C
Electricity and Gas Supply	D
Water Supply, Sewerage, Waste Management, and Remediation Activities	E
Construction	F
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	G
Transportation and Storage	H
Accommodation and Food Service Activities	I
Information and Communication	J
Financial and Insurance Activities	K
Real Estate Activities	L
Business Activities	MN
Public Administration, Defense, and Compulsory Social Security	O
Education Services	P

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Human Health and Social Work Activities	Q
Other Service Activities	RSTU

IRIO Analysis

The IRIO table is an extension of the Input–Output (I–O) table developed by Leontief (1941). Therefore, the analytical approaches used in the IRIO model are generally similar to those used in the standard I–O analysis that has been widely applied, for example by Bekhet (2010) and Ramadhan et al. (2014). The development from the I–O table to the IRIO table lies in the inclusion of a spatial dimension. This addition allows the analysis to capture not only intersectoral linkages but also interregional linkages. The general form of the IRIO table for two regions and two sectors is presented in Table 3.

Table 3. General Form of the IRIO

		Intermediate Input (S)				Final Demand	Total Output
		Region P		Region Q		(F)	(X)
		1	2	1	2		
Region P	1	S_{11}^{PP}	S_{12}^{PP}	S_{11}^{PQ}	S_{12}^{PQ}	F_1^P	X_1^P
	2	S_{21}^{PP}	S_{22}^{PP}	S_{21}^{PQ}	S_{22}^{PQ}	F_2^P	X_2^P
Region Q	1	S_{11}^{QP}	S_{12}^{QP}	S_{11}^{QQ}	S_{12}^{QQ}	F_1^Q	X_1^Q
	2	S_{21}^{QP}	S_{22}^{QP}	S_{21}^{QQ}	S_{22}^{QQ}	F_2^Q	X_2^Q
Total Input		v_1^P	v_2^P	v_1^Q	v_2^Q		

Total output (X) is obtained from the sum of intermediate inputs (S) and final demand (F) in the same row for each region and each sector (Miller & Blair, 2009). Meanwhile, the input coefficient matrix (A), which contains the elements a, is derived by dividing each element of the S matrix by the corresponding element of the X matrix. The Leontief inverse matrix (L), with elements l, is obtained by subtracting the matrix A from the identity matrix (I) and then taking the inverse, or $(I-A)^{-1}$. The L matrix is then used to calculate the Backward Linkage (BL) index and the Forward Linkage (FL) index, as shown in Table 4.

Table 4. Backward Linkage (BL) and Forward Linkage (FL) Matrices

l_{11}^{PP}	l_{12}^{PP}	l_{11}^{PQ}	l_{12}^{PQ}	FL_1^P
l_{21}^{PP}	l_{22}^{PP}	l_{21}^{PQ}	l_{22}^{PQ}	FL_2^P
l_{11}^{QP}	l_{12}^{QP}	l_{11}^{QQ}	l_{12}^{QQ}	FL_1^Q
l_{21}^{QP}	l_{22}^{QP}	l_{21}^{QQ}	l_{22}^{QQ}	FL_2^Q
BL_1^P	BL_2^P	BL_1^Q	BL_2^Q	

The FL index is obtained by summing each column within the same row, whereas the BL index is obtained by summing each row within the same column. In this study, the FL index is used to analyze the potential of a province to transmit economic impacts to other provinces. The general equation for the FL index is presented in Equation (1) as follows.

$$FL_i^N = \sum_j^n l_{ij}^N \quad (1)$$

Subsequently, the FL index is normalized so that it can be compared with the same sector in other provinces. Equation (2) is used to measure the IDK.

$$IDK_j^P = p \text{ x } \frac{FL_j^P}{\sum_{j=1}^n FL_j^P + \sum_{j=1}^n FL_j^Q} \quad (2)$$

Where IDK_j^P represents the sensitivity index of sector $j$in region P. FL_j^P denotes the forward

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linkage of sector $j$in region P, while FL_j^Qrepresents the forward linkage of sector $j$in region Q, and $p$is the size of the matrix. A value of IDK_j^Pgreater than one ($IDK > 1$)indicates that sector $j$in region Phas a strong capacity to stimulate the growth of production in its downstream sectors, both within the same region and across regions. Conversely, a value of IDK_j^Pless than one ($IDK < 1$)indicates that sector $j$in region Phas a weak ability to stimulate the growth of production in its downstream sectors (Sahara et al., 2024). Furthermore, the value of this IDK is used as one of the indicators in determining the provinces that become the main objects of this study.

IRIO Simulation

The general IRIO model equation underlying the simulation equations is as follows.

$$X = AX + f \quad (3)$$
$$(I - A)X = f \quad (4)$$
$$X = (I - A)^{-1} f \quad (5)$$
$$X = L.f \quad (6)$$

Where: f is the final demand vector, I is a diagonal matrix with ones on the main diagonal and zeros elsewhere, and L is the Leontief inverse, i.e., $(I - A)^{-1}$. Furthermore, a change in the value of f (Δf) will cause a change in the value of X (ΔX), which will serve as the basis for simulating changes in final demand. The simulation of changes in final demand (f) on changes in output for a two-by-two model can be expressed in Equations (7) and (8). In these two equations, a country is assumed to consist of two provinces, namely province P and province Q, and two sectors, namely sector i and sector j. The shock is assumed to occur in final demand (Δf).

$$\Delta X_i^P = \sum_{j=1}^{n} L_{ij}^{PP} \Delta f_j^P + \sum_{j=1}^{n} L_{ij}^{PQ} \Delta f_j^Q \quad (7)$$
$$\Delta X_i^Q = \sum_{j=1}^{n} L_{ij}^{QP} \Delta f_j^P + \sum_{j=1}^{n} L_{ij}^{QQ} \Delta f_j^Q \quad (8)$$

Where ΔX_i^Prepresents the change in output of sector $i$in region P, while ΔX_i^Qrepresents the change in output of sector $i$in region Q. Furthermore, L_{ij}^{PP}denotes the element of matrix Lrepresenting the relationship between sector $i$in region $P$and sector $j$in region P. L_{ij}^{PQ}represents the element of matrix $L$for sector $i$in region $P$with respect to sector $j$in region Q. Meanwhile, L_{ij}^{QP}denotes the element of matrix $L$for sector $i$in region $Q$with respect to sector $j$in region P, and L_{ij}^{QQ}represents the element of matrix $L$for sector $i$in region $Q$with respect to sector $j$in region Q. The change in final demand for sector $j$in region $P$is written as Δf_j^P, while for region Qit is written as Δf_j^Q. The simulation scheme in matrix form is presented in Table 5.

Table 5. Simulation Scheme for Two Provinces and Two Sectors

		Matrix L				Change in Final Demand (FS)	Simulation Results of Total Output (XS)
		Region P		Region Q			
		1	2	1	2		
Region P	1	l_{11}^{PP}	l_{12}^{PP}	l_{11}^{PQ}	l_{12}^{PQ}	FS_1^P	XS_1^P
	2	l_{21}^{PP}	l_{22}^{PP}	l_{21}^{PQ}	l_{22}^{PQ}	FS_2^P	XS_2^P
Region Q	1	l_{11}^{QP}	l_{12}^{QP}	l_{11}^{QQ}	l_{12}^{QQ}	FS_1^Q	XS_1^Q
	2	l_{21}^{QP}	l_{22}^{QP}	l_{21}^{QQ}	l_{22}^{QQ}	FS_2^Q	XS_2^Q

The value of XS represents the total output resulting from the simulation, or the spillover impact caused by a change in final demand as a shock. This spillover effect can affect the province that is the subject of the simulation (intra-regional) or extend across provinces (extra-regional).

Specifically, the simulation in this study aims to compare the potential impact of spatial allocation of funds amounting to IDR 200 trillion. The total number of simulations in this study is six

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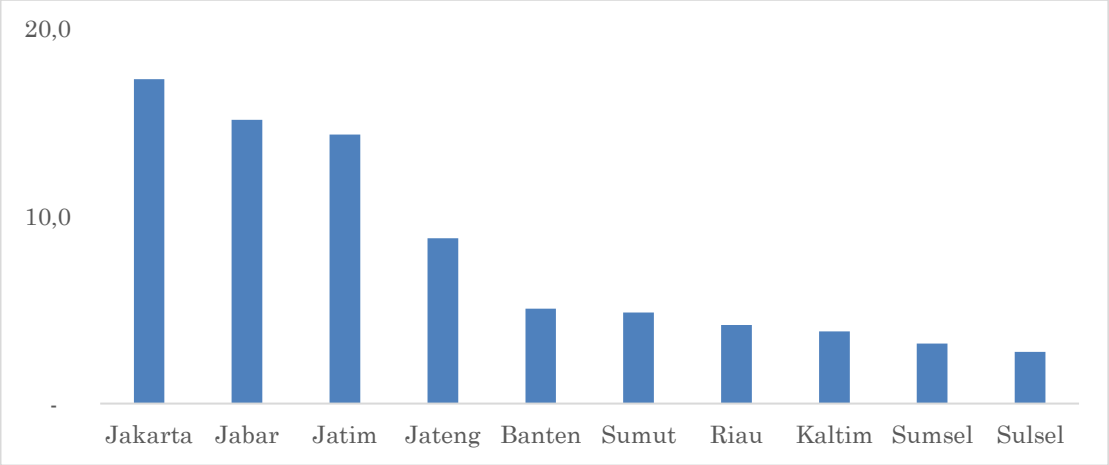
(Sim), with the shock applied to final demand (FS). This is because the increase in funds is assumed to raise Gross Fixed Capital Formation (GFCF). GFCF is a component of final demand that reflects physical investment, i.e., the addition of fixed assets used in the production process over more than one period. This argument is further supported by the loanable funds model proposed by N. Gregory Mankiw (2007), which suggests that an increase in savings leads to a greater supply of loanable funds that can be utilized for investment and consumption activities, thereby increasing aggregate final demand. The simulation will be conducted sequentially across six provinces, where in each simulation a shock of IDR 200 trillion will be distributed evenly among several key sectors within the simulated province. The other provinces that are not simulated are assumed to have unchanged final demand, meaning no shock is applied. The six simulations are as follows.

The first simulation (Sim01) represents the current government policy, in which the funds are allocated to Jakarta, with the final demand shock applied to 14 economic sectors so that each sector receives IDR 14.28 trillion. The second simulation (Sim02) applies the shock to the economy of East Java (Jatim), where 14 key sectors each receive IDR 14.28 trillion. The third simulation (Sim03) allocates the shock to West Java (Jabar), distributed across 12 economic sectors, resulting in a final demand increase of IDR 16.67 trillion per sector. The fourth simulation (Sim04) distributes the shock evenly across 14 economic sectors in Central Java (Jateng), each receiving IDR 14.28 trillion. Finally, the fifth (Sim05) and sixth (Sim06) simulations allocate the shock evenly to 10 economic sectors in Banten and North Sumatra, respectively, so that each sector receives IDR 20 trillion.

The five simulations other than Sim01 (Sim02 to Sim06) represent alternative policy scenarios in which an increase in government savings is assumed to stimulate investment growth in each province simulated within the IRIO model. According to Sahara et al. (2024), simulations of increased funding within the IRIO framework are implemented through an increase in final demand, as this approach is consistent with the basic IRIO model structure represented by equations (3) to (8).

RESULTS AND DISCUSSION

According to the IRIO Table, Indonesia's total national economic output amounts to IDR 23,704.79 trillion (Statistics Indonesia, 2021). Of this total, ten major provinces contribute 79.65 percent of the national output. Six of these ten provinces each have an economic output exceeding IDR 1,000 trillion. Among these six, five provinces are located on Java Island while one, North Sumatra, is situated on Sumatra Island. Jakarta has the highest economic output with a total of IDR 4,109.69 trillion, representing 17.34 percent of the national economy. West Java ranks second with a contribution of 15.15 percent followed by East Java in third place with 14.36 percent. The total economic output of the ten major provinces in Indonesia is illustrated in Figure 1.

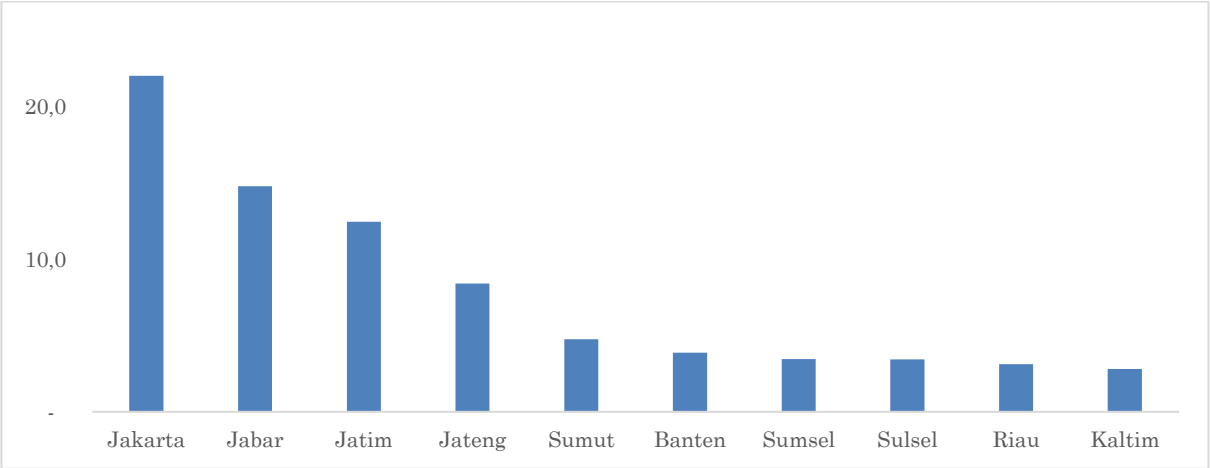


Source: Statistics Indonesia (2021).

Figure 1. Contribution of the Ten Major Provinces to Total National Output (%)

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The total value of GFCF in the Indonesian economy, according to the 2016 IRIO Table, is IDR 3,810.08 trillion (Statistics Indonesia, 2021). The ten major provinces contribute 79.20 percent of the national GFCF. The province with the highest GFCF is Jakarta, accounting for 22.04 percent of the national total, followed by West Java and East Java with contributions of 14.80 percent and 12.48 percent, respectively. The tenth-ranked province is East Kalimantan, with a GFCF value 7.8 times smaller than that of Jakarta. In this study, an increase in funds of IDR 200 trillion is assumed to enhance GFCF as part of final demand. The contribution of each province to Indonesia's total GFCF is presented in Figure 2.



Source: Statistics Indonesia (2021)

Figure 2. Contribution of the Ten Major Provinces to Indonesia's Total GFCF (%)

Based on Figure 2, Jakarta's substantial contribution is attributable to its role as the center of national economic activity. Nevertheless, GFCF generated in other regions such as West Java and East Java also exhibits considerable values. This can encourage the development of other major provinces as national investment destinations. These provinces are expected to support Jakarta's role, allowing the economic burden to be more widely distributed. Changes in GFCF in each province will lead to changes in the total output of that province as well as other provinces.

In this study, the IDK serves as an important indicator, reflecting a province's role in supplying goods and services to support the economies of other provinces. Given that government fund allocation policies tend to be concentrated in Jakarta, this study provides alternative spatial policy scenarios through the spatial roles of five other major provinces, both at the national and regional levels. Therefore, the IDK values are crucial for analyzing the forward linkages of a sector in one province relative to the same sector in other provinces. The IDK calculations indicate that ten provinces in Indonesia have an average IDK value greater than one. This suggests that these provinces are strongly capable of driving production growth in downstream provinces that utilize their outputs. In other words, the economic sector outputs of these ten provinces are highly demanded and competitively significant at the national level. The ten provinces with IDK values greater than one are presented in Table 6.

Table 6. Ten Provinces in Indonesia with IDK > 1

No	Province	Average IDK	Number and Codes of Sectors with IDK > 1
1	Jakarta	2.08	15 (all sectors except A and B)
2	Jatim	1.37	14 (all sectors except E, F and O)
3	Kaltim	1.35	6 (all sectors except D, E, I, J, K, L, MN, O, P, and RSTU)
4	Sumsel	1.23	8 (all sectors except K, I, I, J, K, L, MN, P, Q RSTU)
5	Jateng	1.20	14 (all sectors except B, L, and MN)
6	Banten	1.19	10 (all sectors except A, B, I, J, K, Q and RSTU)
7	Jabar	1.18	12 (all sectors except A, B, J, L and O)
8	Riau	1.01	4 (all sectors except D, E, G, H, I, J, K, L, MN, O, P and RSTU)

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9	Sulsel	1.01	8 (all sectors except H, I, J, K, L, MN, P, Q and RSTU)
10	Sumut	1.01	10 (all sectors except B, D, E, F, J MN, and O)

Based on Table 7, Jakarta is the province with the highest IDK, reaching 2.08, followed by Jatim in second place. In addition, the number of sectors with an IDK greater than one is also an important indicator. This reflects the increasing number of leading sectors within a region. In this study, the indicator of the number of sectors with IDK greater than one serves as a reference for simulating the allocation of additional funds to a province. In the IRIO Table, each province comprises 17 economic sectors. Assuming that a province with the majority of its sectors having an IDK greater than one is a competitive province, a national production center, and a highly diversified region, there are six provinces meeting these criteria. These six provinces are Jakarta, Jatim, Jabar, Jateng, Banten, and Sumut.

IRIO Simulation Analysis

Analysis of Sim01

The current government fund allocation policy is implemented through Himbara, which is spatially located in Jakarta. Therefore, Sim01 is assumed to represent the policy currently carried out by the government. This is due to Jakarta's role as the national economic center, which is expected to generate spillover effects not only on national economic growth but also on the economic growth of other provinces. Based on IDK values, Jakarta ranks highest, with a structurally diversified economy and 14 leading sectors. Consequently, in Sim01, an equal final demand shock is applied to each of these leading sectors. The results of Sim01 are presented in Table 7.

Table 7. Results of Sim01 on National and Regional Output

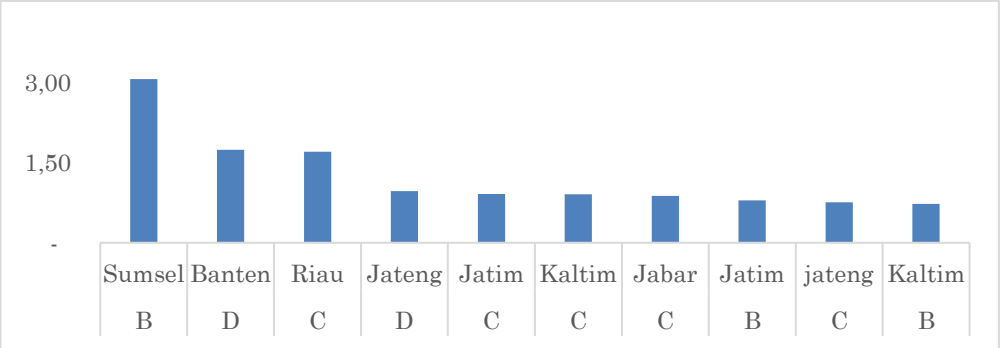
No	Province	Growth		Spillover (%)
		(Growth in IDR trillion)	(Growth in %)	
1	Jakarta	92.1	2.24	74.33
2	Sumsel	4.6	0.60	3.68
3	Jatim	3.7	0.11	2.96
4	Banten	3.5	0.29	2.80
5	Riau	2.7	0.27	2.19
6	Jateng	2.6	0.13	2.13
7	Jabar	2.1	0.06	1.72
8	Kaltim	2.0	0.22	1.63
9	Sumut	1.5	0.13	1.25
10	Lampung	1.1	0.23	0.87
	Extra- regional			25.67
	National Total	123.9	0.52	

The results of Sim01 indicate that changes in final demand lead to an increase in national output of IDR 123.9 trillion, or a growth of 0.52 percent. Of this value, 25.67 percent represents the spillover impact from Jakarta to other provinces in Indonesia. The provinces receiving the largest impact are South Sumatra, followed by Jatim in second place, and Banten in third place. The three regions have leading sectors that are needed and uncompetitive within Jakarta's economy, while also being complementary to Jakarta's sectors. Sumsel, as the most affected province, has a mining sector. Meanwhile, Jatim has a manufacturing sector that is complementary to Jakarta. Furthermore, Banten serves as a supplier of electric energy and also as a manufacturing production base for companies located in Jakarta.

The results of Sim01 at the sectoral level indicate that the three main sectors affected by the increase in funds in Jakarta are the mining and quarrying sector, the electricity and gas supply sector, and the manufacturing sector. The sector receiving the largest impact is the mining and quarrying sector in South Sumatra, followed by the electricity and gas supply sector in Banten, and the manufacturing sector in Riau. In addition to South Sumatra, the mining and quarrying sectors

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in Jatim and Kaltim also experience significant spillover effects from Jakarta. The sectoral results of Sim01 are presented in Figure 3.



Note: Sector Codes in Table 2

Figure 3. Sectoral-Level Results of Sim01 (IDR trillion)

Analysis of Sim02

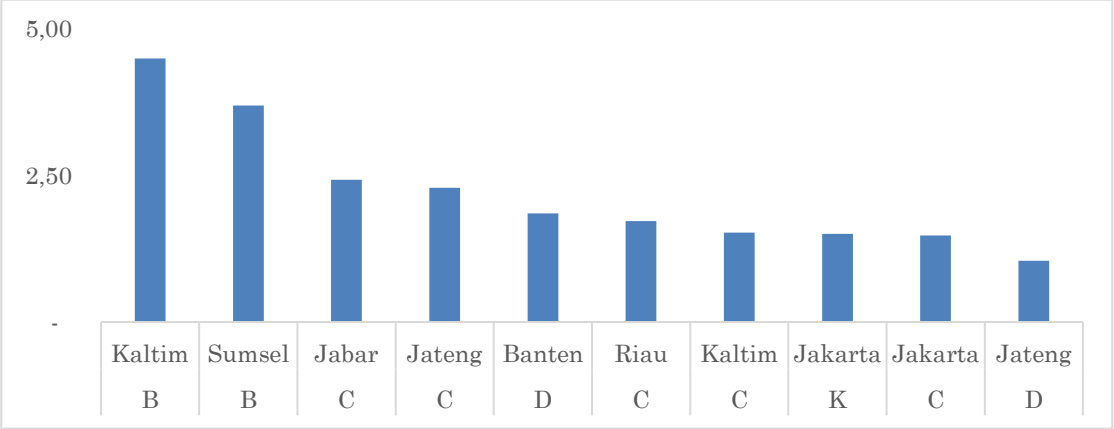
In Sim02, a government fund of IDR 200 trillion is assumed to be distributed evenly across 14 economic sectors in Jatim. Based on the results of Sim02 presented in Table 8, the increase in total national output in this simulation is greater than that in Sim01. In addition, the spillover effects to other regions in Sim02 are also larger than those in Sim01. This indicates that the impact of fund increases in Jatim is broader both nationally and extra-regionally compared to the impact of Jakarta.

Table 8. Results of Sim02 on National and Regional Output

No	Province	Growth		Spillover (%)
		(Growth in IDR trillion)	(Growth in %)	
1	Jatim	87.30	2.56	66.74
2	Kaltim	7.08	0.77	5.41
3	Jakarta	6.27	0.15	4.80
4	Sumsel	5.49	0.72	4.20
5	Jateng	4.80	0.23	3.67
6	Jabar	4.23	0.12	3.23
7	Banten	3.34	0.28	2.56
8	Riau	2.55	0.26	1.95
9	Kalteng	2.14	0.92	1.64
10	Sumut	1.36	0.12	1.04
Extra- regional				33.26
National Total		130.80	0.55	

In Table 9, at the extra-regional level, Jatim generates the highest spillover to Kaltim, particularly in the mining and quarrying sector as well as the manufacturing sector. Jakarta ranks second, with the most affected sectors being financial and insurance services and manufacturing. In addition to Kaltim, the mining and quarrying sector also experiences impacts in South Sumatra. The sectoral results of Sim02 are presented in Figure 4.

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Note: Sector Codes in Table 2

Figure 4. Sectoral-Level Results of Sim02 (IDR trillion)

Analysis of Sim03

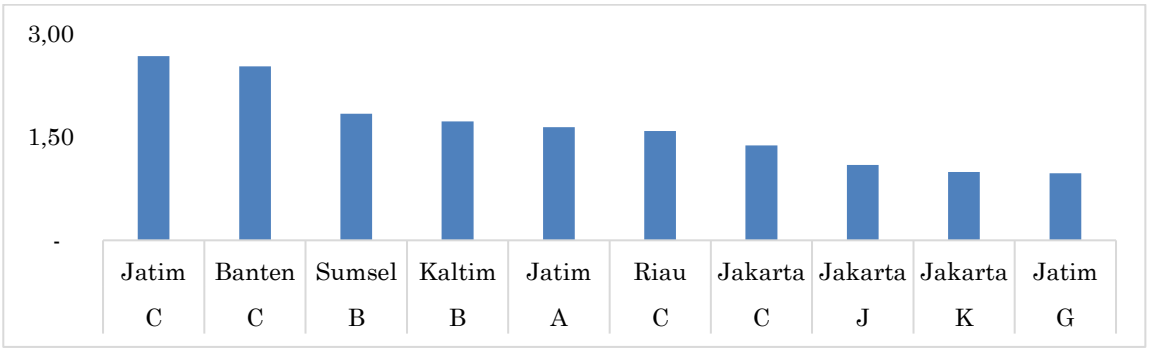
The results of Sim03, presented in Table 9, represent the potential impact of an increase in government funds in Jabar. Sim03 has a greater effect on the growth of national economic output compared to the two previous simulations (Sim01 and Sim02). However, the spillover impact to other provinces, which amounts to 24.47 percent, is still smaller than in Sim01 and Sim02. This is because the majority (75.53 percent) of the spillover is absorbed back into Jabar's own economy.

Table 9. Results of Sim03 on National and Regional Output

No	Province	Growth		Spillover (%)
		(Growth in IDR trillion)	(Growth in %)	
1	Jabar	116.20	3.24	75.53
2	Jatim	7.96	0.23	5.17
3	Jakarta	6.42	0.16	4.17
4	Banten	4.52	0.38	2.94
5	Kaltim	2.97	0.32	1.93
6	Riau	2.83	0.28	1.84
7	Sumsel	2.78	0.37	1.81
8	Jateng	2.33	0.11	1.51
9	Sumut	0.96	0.08	0.62
10	Lampung	0.85	0.18	0.55
	Extra- regional			24.47
	National Total	153.85	0.65	

The provinces receiving the largest spillover from Jabar are Jatim, accounting for 5.17 percent, followed by Jakarta in second place with 4.17 percent, and Banten with 2.94 percent of the total output increase. At the sectoral level, the sectors receiving the largest spillover in Jatim from Jabar are the manufacturing sector and the wholesale and retail trade, repair of motor vehicles and motorcycles sector. In Jakarta, the two main sectors affected by Sim03 are the information and communication sector and the financial and insurance services sector. Other significant sectors receiving substantial spillover include the mining and quarrying sector in both South Sumatra and Kaltim.

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Note: Sector Codes in Table 2

Figure 5. Sectoral-Level Results of Sim03 (IDR trillion)

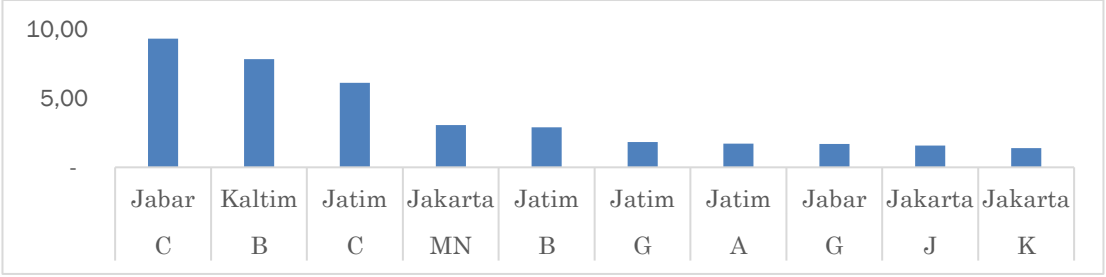
Analysis of Sim04

The results of Sim04, presented in Table 10, indicate that national economic output has the potential to increase by IDR 219.76 trillion, or grow by 0.93 percent. The extra-regional spillover impact is 28.25 percent. The provinces receiving the largest spillover are Jatim at 7.08 percent, followed by Jabar in second place at 6.36 percent, and Kaltim in third place. Jakarta ranks fourth, receiving a spillover of 4.5 percent from Jateng. The high impact received by Jabar and Jatim is closely related to the geographic position of these two provinces, which directly border the source of the spillover in Sim04, namely Jateng.

Table 10. Results of Sim04 on National and Regional Output

No	Province	Growth		Spillover (%)
		(Growth in IDR trillion)	(Growth in %)	
1	Jateng	157.68	7.53	71.75
2	Jatim	15.56	0.46	7.08
3	Jabar	13.98	0.39	6.36
4	Kaltim	10.31	1.13	4.69
5	Jakarta	9.89	0.24	4.50
6	Banten	2.78	0.23	1.26
7	Sumsel	1.14	0.15	0.52
8	Riau	1.10	0.11	0.50
9	Sumut	0.75	0.07	0.34
10	Kaltara	0.66	0.63	0.30
	Extra- regional			28.25
	National Total	219.76	0.93	

At the sectoral level, the economic sectors in the three main provinces receiving spillover from Jateng are the manufacturing sector and the wholesale and retail trade, including repair of motor vehicles and motorcycles, located in Jatim and Jabar. The mining and quarrying sector in Kaltim also receives spillover. Jakarta receives the highest spillover in the business services sector, the information and communication sector, and the financial and insurance services sector. The sectoral results of Sim04 are presented in Figure 6.



Note: Sector Codes in Table 2

Figure 6. Sectoral-Level Results of Sim04 (IDR trillion)

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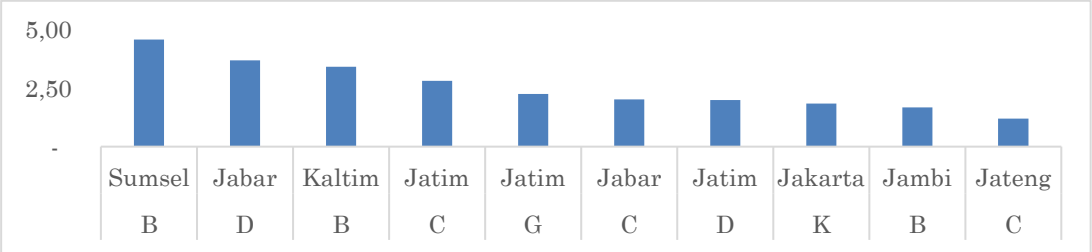
Analysis of Sim05

The fifth simulation (Sim05), presented in Table 11, represents the potential impact of allocating IDR 200 trillion of government funds across 10 economic sectors in Banten. The potential increase in national economic output under Sim05 is IDR 138.61 trillion, with a total spillover effect to other provinces of 41.79 percent. The provinces receiving the highest spillover from Banten are Jatim at 7.53 percent, followed by Jakarta in second place at 6.09 percent, and Jabar in third place at 6.03 percent.

Table 11. Results of Sim05 on National and Regional Output

No	Province	Growth		Spillover
		(Growth in IDR trillion)	(Growth in %)	(%)
1	Banten	80.69	6.70	58.21
2	Jatim	10.43	0.31	7.53
3	Jakarta	8.44	0.21	6.09
4	Jabar	8.36	0.23	6.03
5	Sumsel	6.78	0.89	4.89
6	Kaltim	5.13	0.56	3.70
7	Jateng	3.58	0.17	2.58
8	Jambi	2.42	0.96	1.74
9	Sulsel	1.89	0.29	1.37
10	Riau	1.58	0.16	1.14
Extra- regional				41.79
National Total		138.61	0.58	

At the sectoral level, Jatim receives spillover from Banten in the manufacturing sector, followed by the wholesale and retail trade, repair of motor vehicles and motorcycles sector, and the electricity and gas supply sector. Jakarta receives spillover from Banten primarily in the financial and insurance services sector. In Jabar, the sectors affected by Sim05 are the electricity and gas supply sector and the manufacturing sector. In addition, the mining and quarrying sectors in South Sumatra, Kaltim, and Jambi are also important sectors receiving significant spillover from Banten. The sectoral results of Sim05 are presented in Figure 7.



Note: Sector Codes in Table 2

Figure 7. Sectoral-Level Results of Sim05 (IDR trillion)

Analysis of Sim06

The next province with significant contribution and competitiveness is Sumut. This province is located on Sumatra Island but still maintains industrial linkages with Jakarta and provinces on Java Island. Therefore, Sim06 was conducted, in which government funds of IDR 200 trillion were allocated across 10 leading sectors in Sumut. The potential increase in national output based on Sim06 results is IDR 128.41 trillion. Of this increase, 63.80 percent represents intra-regional effects, impacting Sumut's own economy, while the remaining 36.20 percent is the total spillover effect received by other Indonesian provinces. Although geographically on a different island, Jakarta receives the largest spillover at 6.29 percent, followed by Riau, which directly borders Sumut on the same landmass, at 5.49 percent, and Banten in third place. Spatially, the ten provinces receiving spillover from Sumut are located on Java and Sumatra Islands. These ten provinces, including Sumut, absorb 93.8 percent of the impact, while only 6.2 percent affects the remaining 24 provinces. This indicates that spillover to other regions, particularly in eastern Indonesia, is relatively small.

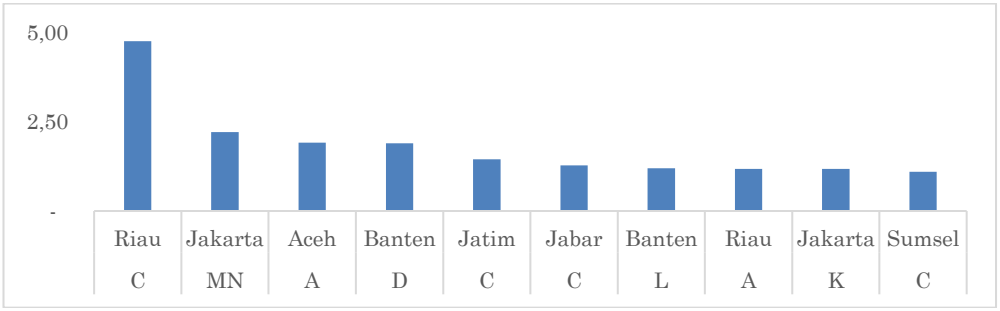
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The results of Sim06 on economic output increases are presented in Table 12.

Table 12. Results of Sim06 on National and Regional Output

No	Province	Growth		Spillover
		(Growth in IDR trillion)	(Growth in %)	(%)
1	Sumut	81.93	7.12	63.80
2	Jakarta	8.08	0.20	6.29
3	Riau	7.05	0.71	5.49
4	Banten	5.46	0.45	4.25
5	Jatim	4.54	0.13	3.54
6	Aceh	3.11	1.34	2.42
7	Sumsel	2.95	0.39	2.29
8	Jabar	2.88	0.08	2.24
9	Jateng	2.38	0.11	1.85
10	Sumbar	2.11	0.66	1.64
Extra- regional				36.20
National Total		128.41	0.54	

The allocation of government funds to the economy of Sumut impacts the output of sectors across provinces. The most affected sector is the manufacturing sector, particularly in Riau. In addition to Riau, increases in this sector also occur in Jatim, Jabar, and South Sumatra. The second most affected sector is the business services sector in Jakarta, where Jakarta holds competitiveness in this sector. Furthermore, the financial and insurance services sector in Jakarta also experiences positive impacts from Sim06. The agriculture, forestry, and fisheries sector receiving spillover from the fund increase in Sumut is located in the two provinces directly bordering Sumut, namely Aceh and Riau. The sectoral results of Sim06 are presented in Figure 8.



Note: Sector Codes in Table 2

Figure 8. Sectoral-Level Results of Sim06 (IDR trillion)

The simulation results indicate that the allocation of government funds into regional economies generates different economic impacts depending on the structural characteristics of each recipient province (Table 13). From the perspective of spatial economics and interregional linkages, these differences reflect the position of each province within the national production network. Regions with high industrial connectivity and extensive input-output linkages tend to generate larger multiplier effects compared to regions with more internally concentrated economic structures. Therefore, the effectiveness of government fund transfer policies is determined not only by the amount of funds allocated, but also by the capacity of a region to transmit spillover effects to other provinces.

Table 13. Comparison of Impacts Across Simulations

Simulation	Impact on the Increase in National Output (in IDR Triliun)	Spillover Effects on Other Provinces (%)
Sim01	123.9	25.67
Sim02	130.8	33.26

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Sim03	153.85	24.47
Sim04	219.76	28.25
Sim05	138.61	41.79
Sim06	128.41	36.2

Sim01 demonstrates that Jakarta, as the national economic center, continues to function as a demand center for other regions. The substantial spillover effects toward resource-based and manufacturing provinces indicate that Jakarta's economic activities depend heavily on input supplies from hinterland regions. Within the core-periphery framework, this condition illustrates Jakarta's role as a core region concentrating service, financial, and consumption activities, while other regions function as suppliers of raw materials, energy, and industrial goods. However, the relatively smaller spillover effects compared to several other simulations suggest that Jakarta's economic activities are largely cumulative in nature, where economic resources tend to be domestically centralized, thereby limiting the nationwide distribution of multiplier effects.

In contrast to Jakarta, East Java in Sim02 exhibits broader spillover capacity. This finding indicates that East Java functions as a stronger production hub within the national economic network. The province's manufacturing- and logistics-based economic structure enables fiscal stimuli to spread more effectively across upstream and downstream sectors in various regions. East Java can therefore be categorized as a secondary growth pole capable of transmitting growth beyond the national core region. The substantial spillover effects toward East Kalimantan also reveal strong linkages between manufacturing and extractive sectors, where industrialization in Java remains highly dependent on natural resource supplies from outside the island.

The simulation results for West Java in Sim03 generate high national economic growth but relatively lower interregional spillover effects. This condition reflects the presence of a strong backwash effect, whereby economic stimuli are largely reabsorbed within the originating region due to high internal interindustry linkages. West Java possesses the largest manufacturing base in Indonesia, with highly integrated domestic supply chains within the province itself. Consequently, increases in final demand tend to stimulate local economic activities more intensively rather than transmitting growth to other regions. This phenomenon suggests that regions with high levels of industrialization do not necessarily produce the largest spillover effects when their economic structures are highly internally concentrated.

Sim04 indicates that Central Java generates the largest national impact among all simulations. From a regional economic perspective, Central Java's geographic position in the middle of Java Island creates spatial advantages in the form of lower distribution costs and high interregional connectivity. In addition, the province's economic structure, which is sectorally strong in manufacturing, positions Central Java as an important hub connecting major provinces on Java Island. This is reflected in the simulation results, where substantial spillover effects toward East Java and West Java indicate that economic integration along the Java corridor is a key factor in transmitting national economic growth. Accordingly, Central Java possesses significant potential as a more balanced center for growth distribution compared to overly concentrated core regions.

In Sim05, Banten generates the highest interregional spillover effects among all simulations. Economically, this finding indicates that Banten possesses very strong forward linkages with other regions. This indicates that Banten absorbs less of spillover into its own economy compared to what is transmitted to other provinces, consistent with the findings of Hidayat (2022). Banten's economic structure, dominated by manufacturing industries, energy sectors, and export-oriented industrial zones, implies that increased economic activity in the province requires inputs from many regions while simultaneously distributing outputs across multiple provinces. The high spillover effects demonstrate that Banten functions as an industrial node within the national production network. In the context of regional development, these findings suggest that metropolitan buffer regions with strong industrial and infrastructure bases may generate broader economic transmission effects than the primary economic center itself.

On the other hand, Sim06 shows that North Sumatra possesses relatively strong spillover

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capacity, although its distribution remains concentrated in western Indonesia. This phenomenon reflects the persistence of spatial segmentation within Indonesia's national economic structure. Limited logistical and industrial connectivity between western and eastern regions constrains the transmission of growth from North Sumatra to eastern Indonesia. From a regional development perspective, this condition indicates that national economic integration continues to be dominated by the Sumatra–Java corridor. Although North Sumatra has considerable potential to serve as a growth center outside Java, infrastructural limitations and weak cross-regional production connectivity remain significant barriers to expanding spillover effects nationwide.

Overall, the six simulations demonstrate that government fund transfer policies are likely to be more effective when directed toward regions with strong interindustrial and interregional linkages. Regions with high production capacity, strong logistical connectivity, and strategic positions within the national economic network tend to generate broader multiplier and spillover effects. These findings further suggest that national economic development should not rely solely on major growth centers such as Jakarta, but should also strengthen alternative growth centers with greater economic transmission capacity. Therefore, fiscal distribution strategies that take into account the spatial structure of the economy may serve as an important instrument for promoting more balanced interregional growth in Indonesia.

At the sectoral level, several sectors receive the largest spillover in output growth, particularly the manufacturing sector in provinces on Java Island. The next most affected sector across the five simulations (Sim01 to Sim05) is the mining and quarrying sector in Kaltim. According to Gani et al. (2022), Kaltim is one of the provinces with a higher number of leading sectors in the Makassar Strait region, especially in mining and quarrying. The interlinkages between sectors and regions in Sim01 to Sim05 indicate strong spillover relationships between the mining and quarrying sector, particularly in Kaltim and South Sumatra, and the manufacturing sector across five provinces on Java Island. This is important because the manufacturing sector can multiply the output value of the mining and quarrying sector (Fitrianto et al., 2025). The results of Sim06 show that Sumut's spillover effects are largely received by provinces on Sumatra and Java, which is consistent with the findings of Febriyani (2023).

The analysis of the six simulations also reveals the spillover relationship between Jakarta as the primary central location and the other five provinces that function as secondary central locations within a lower spatial hierarchy. This relationship can be examined by comparing the spillovers transmitted to Jakarta and those received from Jakarta by the smaller provinces. On average, the spillover transmitted by Jakarta to each smaller central location was 2.17 percent, which was lower than the average spillover received by Jakarta from the five provinces, amounting to 5.17 percent. These findings indicate that, in addition to absorbing substantial internal spillovers as demonstrated in Sim01, Jakarta also absorbs more spillovers from other central locations than it transmits to them. This suggests the presence of a backwash effect, whereby the primary economic center attracts economic resources from surrounding regions. The spillover relationship between Jakarta Province and the other five major provinces is presented in Table 14.

Table 14. Spillover Relationship Between Jakarta and the Five Other Central Locations (%)

No	Province	Spillover Direction	
		To Jakarta	from Jakarta
1	Jatim	4,80	2,96
2	Jabar	4,17	1,72
3	Jateng	4,50	2,13
4	Banten	6,09	2,80
5	Sumut	6,29	1,25
Average Spillover		5,17	2,17

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CONCLUSIONS AND SUGGESTION

Six major provinces analyzed in this study contribute 65.61 percent of Indonesia's total national economic output. These provinces are Jakarta, West Java, East Java, Central Java, Banten, and North Sumatra. They also account for 66.34 percent of total national gross fixed capital formation (GFCF), with 22 percent concentrated in the main investment region, Jakarta. Moreover, the economic structures of these provinces are dominated by highly competitive sectors, with average IDK values greater than one. This serves as an initial indicator for analyzing the influence of these six provinces on other provinces in Indonesia. The results of the simulation of government fund increases in Jakarta (Sim01) show that the potential output increase from this simulation is the lowest compared to the other five simulations. The simulation yielding the highest potential output is Sim04, where government fund allocation in Central Java has the greatest potential to boost national economic output. In terms of interprovincial spillover effects, Sim01 also has the lowest potential impact, ranking fifth among the six simulated provinces. The province generating the highest spillover for increasing output in other provinces is Banten (Sim05).

At the sectoral level, the simulation impacts are distributed across economic sectors in each province. The results from the five provinces on Java Island (Sim01 to Sim05) show broader cross-sectoral and interprovincial spillover effects compared to Sim06 (North Sumatra). The spillover effects of Sim06 are concentrated in sectors located in Java and Sumatra. The sectors affected by all six simulations include the manufacturing sector across provinces on Java and Sumatra, as well as the mining and quarrying sector, particularly in South Sumatra and East Kalimantan. Key sectors in Jakarta, besides manufacturing, that also have potential for growth due to fund increases in other provinces are the business services sector and the financial and insurance services sector. Specifically, in Sim06, the allocation of funds to North Sumatra has the potential to increase output in the agriculture, forestry, and fisheries sectors in Aceh and Riau provinces.

The analysis of the six simulations reveals a spillover relationship between Jakarta as the primary central location and the five other provinces functioning as secondary central locations within a lower spatial hierarchy. The results indicate that Jakarta receives greater spillover effects from these provinces than it transmits to them, in addition to absorbing substantial internal spillovers. This pattern suggests the presence of a backwash effect, whereby the primary economic center attracts economic resources from surrounding regions.

Based on the simulation results of government fund increases on total national output and interregional spillover effects, the allocation of IDR 200 trillion in government funds should be designed using a spatial allocation approach that considers the effectiveness of economic multipliers as well as intersectoral and interregional linkages. The analysis shows that the simulation of fund increases in Central Java produces the highest potential impact on national output compared to other provinces. This finding indicates that Central Java occupies a strategic position within the national production network. Therefore, this province can serve as an alternative policy option for fund allocation alongside Jakarta to maximize the transmission of economic growth nationwide. Furthermore, Banten demonstrates the highest capacity to generate interregional spillovers, indicating that increases in economic activity in this region are transmitted more to other provinces than absorbed internally. This characteristic positions Banten as a key node in the diffusion mechanism with broad spatial impacts. Consequently, allocating government funds to Banten also represents an alternative spatial policy option, as it can expand the spread of growth effects to other regions.

East Java and West Java are also prioritized as alternative locations for fund allocation due to their large manufacturing bases and high sectoral linkages within the national production system. Government investment in these provinces should focus on enhancing the productivity of the manufacturing sector and strengthening the integration of national supply chains connected to the extractive sectors in East Kalimantan and South Sumatra. Meanwhile, allocating funds to North

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Sumatra is important for strengthening economic connectivity in western Indonesia, particularly through the development of the agroindustry sector and the enhancement of interprovincial production linkages across Sumatra and Java. Allocation of funds in Jakarta remains important but should be combined with strategic placement in other major provinces.

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