Transfer Payments and Economic Sector Performance: Input-Output Analysis in Bandung Regency

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Abstract: This study analyzes the effect of transfer funds on Bandung Regency’s economic sectors in 2022, using input-output table analysis to formulate suitable allocation policies for economic development goals. The research was conducted using the Location Quotient (LQ) method. This research produced an inverse Leontif matrix. Leontif’s inverse matrix can be used to analyze the interrelationships between economic sectors in Bandung Regency. Revised: The government transfer expenditure in Kabupaten Bandung in 2022 had a direct impact of IDR 459,979,360,622.89 on the Government Administration, Defense, and Mandatory Social Security sector. The indirect impact or multiplier effect on the other 16 economic sectors was IDR 241,790,256,760.42. Analysis through the Leontief inverse matrix shows that the increase of final demand in all sectors by IDR 1 billion would result in an output increase of IDR 1.53 billion in the Government Administration, Defense, and Mandatory Social Security sector. Conversely, if the final demand in that sector increases by IDR 1 billion, the output of all sectors will increase by IDR 1.02 billion. Therefore, the government transfer expenditure in Kabupaten Bandung positively impacted the growth of all economic sectors.

Keywords: transfer payments; economic sector performance; input-output analysis; Bandung regency.

1. Introduction

The enactment of Law No. 22 of 1999 on the financial balance between the central government and regional governments marked the beginning of regional autonomy. This law brought changes to the system and mechanisms of regional governance. The law has undergone several revisions, the latest revised by Law No. 1 of 2022. One of the implementations of regional autonomy is the transfer of authority from the central government to regional governments in various fields. Regional governments are given the authority to determine transfer payments from the balance funds and funds derived from regional own-source revenue through the general allocation fund (DAU).

Halim (2016) states that transfer payments are block grant fund transfers. Regional governments have the flexibility in using DAU according to the needs and aspirations of each region. The purpose of transfer payments is to reduce inequality in regional financing needs. This central government transfer is one of the sources of regional government funds to finance regional expenditures, which will later be reported in the calculation of the APBD. This transfer aims to reduce the fiscal gap between governments and ensure the achievement of
minimum public service standards in all regions.

Various forms of expenditure through the General Allocation Fund (DAU) contribute to increasing community income and economic growth. Mohkla's (2019) research shows that DAU positively and significantly affects capital expenditure. Central government transfer funds positively affect economic growth through capital expenditure (Hasan, 2015). The transfer policy is the allocation of income from high-income household groups to low-income household groups. The transfer policy is a form of social security that is relatively effective in increasing the economy (output) and household income distribution (Zaini, 2004). Regional Transfers consist of the General Allocation Fund (DAU), which has a positive effect on economic growth (Agus Sunarya Sulaeman, 2019).

Transfer spending is a component of government spending on the expenditure side. In the input-output model, government spending is a final demand component (Y). If the value of transfer funds in a particular year is known, then the output value of all sectors in that year can be known. The increase in sectoral output is a multiplier effect of the transfer of funds issued by the government. Analysis of the input-output of the economy of a country or region can be carried out if a country or region has an Input-Output Table. The input-output table is obtained from the results of an extensive survey. The survey was conducted on all actors in the industrial sector and households. The data from the survey results are combined with regional income, which is reviewed from the revenue and expenditure side. Compiling an input-output table requires a lot of time and resources, so a country or region cannot publish an input-output table every year.

Until now, Bandung Regency does not yet have an input-output table for survey results. Input-output tables are needed for planning and evaluating the impact of government policies. The need for input-output tables for the district/city level can be done through an assessment of the provincial level input-output tables. Lenita & Yanti (2022), using the Location Quotient (LQ) method, estimates the input-output table for Bandung Regency based on the West Java Input-output table. Based on sectoral analysis for the spreading power index, in Bandung district, eight sectors have a more potent driving force than the other nine sectors. Based on the degree of sensitivity index to external aspects, in Bandung district, four sectors have the highest sensitivity, which affects all downstream sectors. The GRDP of Bandung Regency in 2021 is in fifth place with an acquisition of IDR 130.47 billion and is below the average GRDP of West Java Province. The most significant GRDP gain came from the Processing Industry sector (Rp 69.43 billion), and the smallest came from the Water Procurement, Waste Management, Waste, and Recycling sector (Rp 51.71 billion). GRDP is formed due to the influence of the final demand in each sector (direct effect) and the sectoral influence of each business field (indirect effect). The input-output table analysis can study each sector's direct and indirect effects.

This research will examine the effect of transfer funds on increasing output in each economic sector in Bandung Regency in 2022. Through the multiplier effect, the direct and indirect effects of increasing output in each economy will be known due to increased local government spending. The results of this research are helpful for the regional government of Bandung Regency to find out the impact of the allocation of regional government expenditure funds on the growth of each economic sector. The research results can be used as a reference for formulating more appropriate allocation policies following economic development goals in Bandung Regency.
2. Literature Review

2.1. Input-Output Analysis

The Input-Output Analysis Model is a model that can be used for planning and evaluating development results. This model is a comprehensive study of regional or national development. One of the input-output analysis model’s strengths is its ability to measure the interrelationships between sectors. Analysis of inter-sectoral linkages (backward and forward linkage analysis) and multiplier effect analysis are essential in sectoral planning (Yanti, 2009). Input-output analysis is used to analyze the influence of the economic sector from the production side of the country’s or region’s economy. Input-output analysis refers to the assumption of a balanced flow of transactions between economic actors (Boumal, 2014).

The main uses of Input-Output analysis are:

1) Able to see the economic structure of a region or nationally. The link between one sector, the level of public consumption, investment, government spending, imports, exports, and labor factors can be seen through the input-output analysis model. Based on this analysis it can be seen the level of linkages between sectors (Linkage Analysis).

2) Know the multiplier effect caused by changes in demand from one sector to another.

3) As a basis for decision-making and government policies regarding the direction of the economic development strategy of a region, this method can create an economic perspective in the short, medium, and long term.

Input-output analysis is based on the Input-Output Table, which describes the transaction of the flow of goods and services. Goods and services are in the form of output produced by a sector and distributed to two users: The output used by the first user is used for the production process of the sector, while the second user is the end user of the output. The output is used as raw material or intermediate input for the first user, while for the second user, the output is the final demand.

In the context of intermediate inputs, goods and services flow between sectors, for example, from sector i to sector j. In addition, there is a movement of goods and services between sectors. Suppose the monetary value of the flow of goods and services from sector i to sector j is denoted $z_{ij}$, the total output is denoted $X_i$, and the total demand for sector i is denoted $Y_i$, then goods and services transactions are written as:

$$X_i = z_{i1} + z_{i2} + \ldots + z_{in} + Y_i \quad : i = 1, 2, \ldots, n$$

Equation (1) shows the output distribution from sector i to other production sectors and allocated to end users (Y). Equation (1) is written in matrix form:

$$
\begin{bmatrix}
X_1 \\
X_2 \\
\vdots \\
X_n
\end{bmatrix}
= 
\begin{bmatrix}
z_{11} & z_{12} & \cdots & z_{1n} \\
z_{21} & z_{22} & \cdots & z_{2n} \\
\vdots & \vdots & \ddots & \vdots \\
z_{n1} & z_{n2} & \cdots & z_{nn}
\end{bmatrix}
+ 
\begin{bmatrix}
Y_1 \\
Y_2 \\
\vdots \\
Y_n
\end{bmatrix}

a_{ij} = \frac{z_{ij}}{X_j}
$$

If the technological coefficient is known, namely the amount of input used to produce one unit of sector j originating from sector i, then it is formed.
Because $X$ is an endogenous factor and $Y$ is an exogenous factor, the writing becomes:

$$
\begin{bmatrix}
X_1 \\
X_2 \\
\vdots \\
X_n
\end{bmatrix}
= 
\begin{bmatrix}
1 & 0 & \cdots & 0 \\
0 & 1 & \cdots & 0 \\
\vdots & \vdots & \ddots & \vdots \\
0 & 0 & \cdots & 1
\end{bmatrix}
\begin{bmatrix}
a_{i1} & a_{i2} & \cdots & a_{in_x} \\
a_{j1} & a_{j2} & \cdots & a_{jn} \\
\vdots & \vdots & \ddots & \vdots \\
a_{n1} & a_{n2} & \cdots & a_{nn}
\end{bmatrix}
\begin{bmatrix}
X_1 \\
X_2 \\
\vdots \\
X_n
\end{bmatrix}
= 
\begin{bmatrix}
y_1 \\
y_2 \\
\vdots \\
y_n
\end{bmatrix}
$$

(2)

End users ($Y$) or exogenous factors are actors in the economy; in the aggregate, they can be classified into households (consumption), companies (investment), government (government spending), and foreign parties (exports, imports). Equation (2) can be written as follows:

$$
X = (I - A)^{-1}\begin{bmatrix}
C + I + G + (E - M)
\end{bmatrix}
$$

Where:

- $X$ = outputs
- $C$ = household consumption
- $I$ = investment
- $G$ = government spending
- $E$ = export
M = import
A = technology matrix
(I-A)^-1 = multiplier matrix or inverse Leontif matrix

A matrix is formed from the input-output table. The preparation of the input-output table is based on the assumption that technology does not change easily. Changes in exogenous factors will have an impact on output changes of:

$$\Delta X = (I - A)^{-1} \Delta Y$$

(3)

2.2. Government Spending

In the macroeconomic context, government spending is one of the variables forming the Gross Domestic Product (GDP) for national coverage and Gross Regional Domestic Product (GDP). Government spending (G) is one of the exogenous factors in the final demand component in the input-output model.

According to Budiono (1998), government spending in the macroeconomic concept can be categorized into three, namely:

1) Government spending for the purchase of goods and services;
2) Government spending on employee salaries;
3) Government spending for transfer payments. Transfer payments are direct payments or gifts from the government to its citizens, including payments of subsidies or direct assistance to various groups of people, pension payments, and interest payments for government loans to the public.

Government spending is used to analyze the factors that affect the demand for and availability of public goods. The interaction between demand and supply will determine how much public goods must be provided through the budget. The number of public goods that will be provided will, in turn, lead to demand for other goods (Basri, in Azwar 2016). Government spending will drive economic activity and job creation in each economic sector. Economic sectors have different levels of response to government spending.

3. Research Methods

Input-output analysis can be done if a country or region has an input-output table. The input-output table is obtained from the results of an extensive survey. The survey was conducted on the industrial and household sectors' demand, supply, and income. Compiling input-output tables takes a lot of money and a long time, so not all regions have input-output tables. The time for preparing the input-output table between the first and the following table preparation has a long time interval. The West Java input-output table was compiled in 2016; until now (2023), there has been no new West Java input-output table.

Bandung regency, until now, has yet to have an input-output table. In 2022, Lenita & Yanti (2022) conducted research to determine the technology matrix of Bandung Regency based on the technology matrix of the West Java Province input-output table. The research was conducted using the Location Quotient (LQ) method. This research produced an inverse Leontif matrix (Table 2). Leontif's inverse matrix can be used to analyze the interrelationships between economic sectors in Bandung Regency.

The research that will be carried out is a follow-up research to see the effect of the Bandung Regency government spending in the transfer payment category in 2022 on the output of all sectors. The analysis is based on the assumption that technology has stayed the
This study needs data derived from the inverse Leontif matrix and secondary data on government transfer spending. The data source came from the Bandung Regency Regional Finance and Asset Agency (BKAD) in 2022.

The following is expenditure data carried out by the regional government of Bandung Regency in 2022. Expenditures include; 1) Operational Expenditure of 73.80%, 2) Capital Expenditure of 11.56%, and 3) Transfer Expenditure of 14.65% of the total Expenditure of the Bandung Regency regional government in 2022.

**Table 1. Government Expenditures of Bandung Regency in 2022**

<table>
<thead>
<tr>
<th>Type Shopping</th>
<th>Amount (IDR)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operational Expenditures:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Personnel Expenditures</td>
<td>2,308,435,452,701</td>
<td>73.80%</td>
</tr>
<tr>
<td>2. Expenditures on Goods and Services</td>
<td>1,021,345,223,063</td>
<td></td>
</tr>
<tr>
<td>3. Subsidy Expenditures</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>4. Grant Expenditures</td>
<td>98,978,464,326</td>
<td></td>
</tr>
<tr>
<td>5. Social Expenditures</td>
<td>10,202,500,000</td>
<td></td>
</tr>
<tr>
<td>6. Interest Expenditures</td>
<td>12,025,600,000</td>
<td></td>
</tr>
<tr>
<td><strong>Capital Expenditure:</strong></td>
<td>339,552,543,734</td>
<td>10.85%</td>
</tr>
<tr>
<td>1. Land Capital Expenditures</td>
<td>1,440,935,850</td>
<td></td>
</tr>
<tr>
<td>2. Expenditures on Equipment and Machinery</td>
<td>73,240,402,081</td>
<td></td>
</tr>
<tr>
<td>3. Expenditures on Buildings and Structures</td>
<td>77,547,094,230</td>
<td></td>
</tr>
<tr>
<td>4. Expenditures on Roads, Networks, and Irrigation</td>
<td>181,689,420,621</td>
<td></td>
</tr>
<tr>
<td>5. Expenditures on Other Fixed Assets</td>
<td>4,084,897,985</td>
<td></td>
</tr>
<tr>
<td>6. Expenditures on Other Assets</td>
<td>1,549,792,967</td>
<td></td>
</tr>
<tr>
<td><strong>Unforeseen Expenditures</strong></td>
<td>22,000,000,000</td>
<td>0.70%</td>
</tr>
<tr>
<td><strong>Transfer Expenditures:</strong></td>
<td>458,141,588,501</td>
<td>14.65%</td>
</tr>
<tr>
<td>1. Profit-Sharing Expenditures</td>
<td>50,089,060,001</td>
<td></td>
</tr>
<tr>
<td>2. Financial Assistance Expenditures</td>
<td>408,052,528,500</td>
<td></td>
</tr>
<tr>
<td><strong>Total Expenditures:</strong></td>
<td>3,128,129,584,936</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Bandung Regency Budget Office (BKAD)

4. Results and Discussion

The government expenditures of Bandung Regency in 2022 amounted to IDR 3,128,129,584,936. The largest allocation was for operational expenditures, which amounted to 73.80%. The allocation for capital, unforeseen, and transfer expenditures were 10.85%, 0.70%, and 14.65%, respectively. Transfer expenditures are direct government expenditures for the community through social assistance. Transfer expenditures do not directly produce goods/services received by the government. The community spends and directly enjoys the value of the goods/services obtained. Transfer expenditures increase the purchasing power and consumption of the community. Transfer expenditures will increase the value added to the economy through the multiplier process. The increase in economic activity occurs directly in related economic sectors and other sectors through intersectoral linkages.
The Leontif inverse matrix can be used to analyze the interrelationships among sectors, where other sectors will follow the movement of one sector through backward and forward linkages. If there is a change in one of the exogenous variables, then all sectors will experience a change. The Leontif inverse matrix of Kabupaten Bandung is presented in table 2.

Table 2. Bandung Regency Leontif Inverse Matrix

<table>
<thead>
<tr>
<th>No. Sektor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
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<td>0.0040</td>
<td>0.0029</td>
<td>0.0023</td>
<td>0.0100</td>
<td>0.0194</td>
<td>0.0162</td>
<td>0.0436</td>
<td>0.0194</td>
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<td>2</td>
<td>0.0029</td>
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<td>0.0290</td>
<td>0.3679</td>
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<td>0.0670</td>
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<td>0.0086</td>
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<td>0.0041</td>
<td>0.0038</td>
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<td>0.0085</td>
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<td>0.0875</td>
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<td>0.4640</td>
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<td>0.0252</td>
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<td>0.0015</td>
<td>0.0005</td>
<td>0.0020</td>
<td>0.0015</td>
<td>0.0038</td>
<td>0.0010</td>
<td>0.0010</td>
<td>0.0004</td>
<td>0.0009</td>
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<td>0.0015</td>
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<td>0.0030</td>
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<td>0.0050</td>
<td>0.0139</td>
<td>0.0071</td>
<td>0.0023</td>
<td>0.0048</td>
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<td>0.0047</td>
<td>0.0043</td>
<td>0.0062</td>
<td>0.234</td>
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</table>

Information:
1. Agriculture, Forestry, and Fisheries
2. Mining and Quarrying
3. Processing Industry
4. Procurement of Electricity and Gas
5. Water Procurement, Waste Management, Waste, and Recycling
6. Construction
7. Wholesale and Retail Trade; Car and Motorcycle Repair
8. Transportation and Warehousing
9. Provision of Accommodation and Meals and Drinks
10. Information and Communication
11. Financial Services and Insurance
12. Real Estate
13. Company Services
14. Government Administration, Defense, and Compulsory Social Security
15. Educational Services
16. Health Services and Social Activities
17. Other Services

Through the Leontif Inverse Matrix, every expenditure made by the government can be
predicted by the output value produced in each sector. The effect of spending on each sector can occur directly or indirectly through inter-sector linkages. The change in output value depends on each sector’s multiplier coefficient value. Transfer spending is an element of regional expenditure, included in the sector 14 categories in the Bandung Regency Inverse Leontif Matrix. The impact of the value of transfer spending on added value (output) in each sector is presented in Table 3.

Table 3. The Impact of Government Transfer Expenditure on the Output of 17 Economic Sectors in Bandung Regency in 2022

<table>
<thead>
<tr>
<th>No.</th>
<th>Sector Name</th>
<th>Output (Rp)</th>
<th>Weight (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agriculture, Forestry, and Fisheries</td>
<td>8,879,509,113.30</td>
<td>1.27</td>
</tr>
<tr>
<td>2</td>
<td>Mining and Quarrying</td>
<td>6,613,000,058.78</td>
<td>0.94</td>
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<tr>
<td>3</td>
<td>Processing Industry</td>
<td>72,350,631,659.81</td>
<td>10.31</td>
</tr>
<tr>
<td>4</td>
<td>Procurement of Electricity and Gas</td>
<td>22,254,038,493.44</td>
<td>3.17</td>
</tr>
<tr>
<td>5</td>
<td>Water Procurement, Waste Management, Waste, and Recycling</td>
<td>353,756,205.93</td>
<td>0.05</td>
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<td>6</td>
<td>Construction</td>
<td>19,202,389,514.19</td>
<td>2.74</td>
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<tr>
<td>7</td>
<td>Wholesale and Retail Trade; Car and Motorcycle Repair</td>
<td>20,760,640,950.09</td>
<td>2.96</td>
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<tr>
<td>8</td>
<td>Transportation and Warehousing</td>
<td>20,665,346,279.33</td>
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<td>9</td>
<td>Provision of Accommodation and Meals and Drinks</td>
<td>15,548,149,222.18</td>
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<td>10</td>
<td>Information and Communication</td>
<td>9,965,913,865.87</td>
<td>1.42</td>
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<td>11</td>
<td>Financial Services and Insurance</td>
<td>5,405,267,594.59</td>
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<td>12</td>
<td>Real Estate</td>
<td>4,555,171,236.04</td>
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<td>13</td>
<td>Company Services</td>
<td>29,505,113,910.69</td>
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<td>14</td>
<td>Government Administration, Defense, and Compulsory Social Security</td>
<td>459,979,360,622.89</td>
<td>65.55</td>
</tr>
<tr>
<td>15</td>
<td>Educational Services</td>
<td>3,293,203,080.07</td>
<td>0.47</td>
</tr>
<tr>
<td>16</td>
<td>Health Services and Social Activities</td>
<td>269,906,746.39</td>
<td>0.04</td>
</tr>
<tr>
<td>17</td>
<td>Other Services</td>
<td>2,168,218,829.72</td>
<td>0.31</td>
</tr>
<tr>
<td></td>
<td>Total Outputs</td>
<td>701,769,617,383.31</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Processing results

Bandung regency government transfer expenditure of IDR 458.14 billion contributed to the regional output value of IDR 701.77 billion. The regional output multiplier coefficient due to transfer spending is 1.53. The contribution of transfer spending to economic sectors varies in value. The Government Administration, Defense, and Compulsory Social Security sectors receive the most enormous and most direct contribution from Transfer Expenditure, weighing 65.55%.

An indirect relationship or multiplier effect is seen in the other 16 sectors. The highest indirect impact occurred in the Manufacturing Industry sector, amounting to IDR 72,350,631,659.81, while the minor impact was in the Health Services and Social Activities sector IDR 269,906,746.39. The percentage of indirect effects from transfer spending on all sectors is 34.45%, with an average of IDR 15,111,891,048.00.
5. Conclusion

Government transfer expenditure directly impacts the Government Administration, Defense, and Mandatory Social Security sector, amounting to IDR 459,979,360,622.89. The indirect impact or multiplier effect on the other 16 economic sectors amounts to IDR 241,790,256,760.42. Taking into account the inter-sectoral linkages, through the Leontief inverse matrix, it is found that when the final demand in all sectors increases by IDR 1 billion, the output of the Government Administration, Defense, and Mandatory Social Security sector will increase by IDR 1.53 billion. In contrast, if the final demand in that sector increases by IDR 1 billion, the output of all sectors will increase by IDR 1.02 billion. Therefore, the government transfer expenditure of Kabupaten Bandung in 2022 positively impacts the growth of all economic sectors.

References


Undang-undang Nomor 1 Tahun 2022 Tentang Hubungan Keuangan antara Pemerintah Pusat dan Pemerintah Daerah.
