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Assessment the Impact of Fiscal and Monetary Policy on West Java Province of Indonesia: A Computable General Equilibrium Analysis

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ABSTRACT

Manufacturing Industry has an essential role in West Java economy in contributing to regional output and level employment. Besides, it is very fragile from internal and external shudder. Thus, government intervention is considerably needed to offset the negative impact that might be ensued due to internal and external shocks. This study will analyze the impact of both government fiscal policy and bank monetary policy on industry and West Java economic performance by using the Computable General Equilibrium (CGE) model. Fiscal and monetary policy will positively impact West Java macroeconomic performance in terms of change in real GDRP, investment, consumption, and capital rate of return, with the most significant fiscal policy impact. Conversely, the result is expected to vary at the sector level, and the West Java industry is not so receptive to changes in interest rates that represent monetary policy.

Keywords: Manufacturing industry, fiscal policy, monetary policy, West Java economy

1. INTRODUCTION

The manufacturing industry contributes to West Java regional output, which is measured by the Gross Domestic Regional Product (GDRP). The manufacturing industry from 2014-2019

was always the most massive comparative to other sectors, with a range of between 26 to 28 percent of total GDRP. The second-largest was the agricultural sector, which contributed nearly half of the industry contribution. The contribution of the industry to West Java regional output had fluctuated from 2014 to 2019. It always dropped in odd years. The situation is not due to a cyclical problem, but in 2015, 2017, and 2019 external and internal shocks on the West Java industry occurred.

The West Java Provincial government increased the oil price by 126 % in October 2015, and in March, June, and November 2017, the government increased the oil price for industrial uses to adjust to the international oil price. Meanwhile, in 2019, the West Java industry suffered from the global economic recession, which affected West Java exports of manufacturing commodities. These conditions created an external shock to the West Java industry and harmed manufacturing output. These simply meant that the West Java industry is still fragile to external shocks [1-9].

Much report analyzes the fragility of the West Java industry sector to external and internal shocks. Previous study using the CGE model shows that manufacturing is very sensitive to external shocks, which is represented by an import price shock. Study by [1-3] analyzes the impact of external shocks and vulnerability to the Malaysian economy focusing on the manufacturing sector. Another study by [3] suggested that the Chinese industry is more showing to external variabilities since the shifting of China's production structure. Report by [5] investigates the impact of oil price changes on the United Kingdom's manufacturing sector. [5]'s study by using variance decomposition in the Vector Autoregressive (VAR) model, the study suggests that changes in oil prices (external shock) are essential to determine fluctuations in the UK's manufacturing output. These previous studies exposed the empirical findings to suggest that external shocks impact the industry sector both in developing and in developed countries [5-12].

The West Java government is very concerned with the fragility of the manufacturing sector. Theoretically, if the industry is the most critical sector in the economy, and there is a significant decrease in industrial output, the national output will also drop. These will create a threat to the overall economy. Consequently, the government should intervene through its policies to increase industrial output. The Centre for Development and Integration (2006) proposes that an external shock signified by trade liberalization of Vietnam's garment and footwear industry should be countered to by extensive government support [7-14].

To reduce the possible negative impact of the global economic crisis, the West Java government implemented some fiscal stimulus. The stimulus aimed to support the domestic industry facing the threat of the global crisis. Some of the policies were reducing corporate tax from 30 percent to 28 percent, reducing tax from 35 percent to 30 percent of individual income, and minimalizing the electricity price for the industry.

Furthermore, the Central Bank of Indonesia also supported government policies by lowering the interest rate to decrease corporate obligations based on interest rate payments and incentivizing trades. The aims of this research show the impact of fiscal and monetary policies analysis on the West Java industry and West Java macroeconomic implementation. The research employs a Computable General Equilibrium (CGE) to simulate both fiscal and monetary policy decisions.

The details of the CGE model showed in Section II. In Section III showed results and discussion. Finally, conclusions are depicted in Section IV.



Figure 1. Map of West Java Province

2. METHOD

Computable General Equilibrium (CGE) Model

This study used an updated version of the *Wayang* general equilibrium model of the West Java economy [2-4, 7-9, 13-18]. The model is afterward described as *Wayang 2015* and is based on the 2015 West Java *Input-output Tables* (IO) and the 2015 *Social Accounting Matrix* (SAM) published by Central Bureau of Statistics of the West Java. It identifies ten different types of households, representing ten socio-economic groups as defined in the 2015 SAM. WAYANG, like the original WAYANG model of the Indonesian economy and its predecessors, has some distinct features concerning factor markets. For example, fertiliser is substitutable with primary factors of production in agriculture. In non-agricultural industries, there are two types of capital. One type is mobile between industries, while the other is specific to each industry [8-18].

These features are designed for short- to medium-term scenarios, in which there is insufficient time for all types of capital to be reallocated. Households supply all factors of production. The income earned from these factors consequently determines household income.

The modeller may tie household income to expenditure directly through the consumption function [19-22].

There are two further additions in this model to the standard ORANI-G framework. WAYANG contains a fiscal extension, based on that of the original WAYANG model. And it includes a regional extension, modelling three regions of the Indonesian economy in a top-down manner. The code for the regional extension has been borrowed from the MONASH95 model [8]. Some features, notably dealing with multiple households, have been borrowed from the PRCGEM model of the Chinese economy. The objective of this document is to detail a model of the Indonesian economy in a form that is both recognisable to experienced CGE modellers and helpful to less experienced modellers seeking to understand the basic theory of WAYANG. By conforming with the basic ORANI-G representation, this manual helps make clear both the general and model-specific features of WAYANG [10-20].

As well as disaggregating households, it also has a disaggregated industry and commodity structure, with 52 production sectors. The mapped sectors are focused on manufacturing industries, particularly the “priority” industries for Indonesia. The microeconomic behavior assumed within it is competitive profit maximization on all firms and competitive utility maximization on the part of consumers [8, 17-23]. In the simulations reported in this paper, the markets for final outputs, intermediate goods, and production factors are all assumed to clear at prices that are determined endogenously within the model. Variations to this assumption are possible. For example, the possibility of unemployment can be introduced by varying the closure to make either real or nominal wages exogenous, thereby allowing the level of employment to be endogenously determined by demand.

The nominal exchange rate between the rupiah and the US dollar can be thought of as being fixed exogenously. The role within the exogenous nominal exchange rate model is to determine, along with international prices, the nominal domestic price level. Given that prices adjust flexibly to clear markets, a one percent increase in the rupiah/dollar exchange rate will result in a one percent increase in all nominal domestic prices, leaving all real variables unchanged. In this case, the nominal exchange rate (IDR/USD) is a numeraire price in the model.

Theoretical Structure of The Model

The structure of the model itself is relatively conventional. The CGE model in this study belongs to the class of general equilibrium models that are linear in proportional changes and shares many structural features with the highly influential ORANI general equilibrium model of the Australian economy [8], with numerous adaptation and modification to reflect the realities of the West Java economy.

The analytical structure includes the following major components:

Household consumption demands, of each of the ten broad household types, for 52 categories of consumer goods are derived from the linear expenditure system—the household supplies of labor assumed to be exogenous.

A factor demand system, based on the assumption of CES production technology, relates the demand for each primary factor to industry outputs and the primary factors' prices. The situation reflects the assumption that production factors may be substituted for one another in ways that depend on factor prices and the elasticity of substitution between the factors.

A distinction between skilled and unskilled labor, which are ‘nested’ within the sectoral production functions. In each non-agricultural sector, skilled and unskilled labor enter a CES production function to produce ‘effective labor.’ Sufficient labor, variable capital, and fixed

capital then enter the production functions for domestic output.

Leontief assumptions are made for the demand for intermediate goods. Each intermediate good in each sector is assumed to be demanded in a fixed proportion to the sector's gross output.

Demands for imported and domestically produced versions of each good, incorporating Armington elasticity of substitution between the two. A set of equations determining the incomes of the ten household types from their (exogenous) ownership of production factors, the (endogenous) rates of return to these factors, and any net transfers from elsewhere in the system.

Rates of import tariffs and excise taxes across commodities, rates of business taxes, value-added taxes and corporate income taxes across industries, and rates of personal income taxes across household types, which reflect the West Java tax system's structure, using data from the West Java Agency of Finance. A set of macroeconomic identities which ensures that standard macroeconomic accounting conventions are observed.

Empirical Features of The Model

Industries

The national model contains 52 producer goods and services produced by 52 related industries - 5 agricultural and mining industries, 36 classifications of manufacturing industries, 11 utilities, and service industries. Each industry produces a single output, so the set of commodities coincides with the set of industries.

Commodities

Wayang 2015 contains two types of commodities - producer goods and consumer goods. Producer goods come from two sources: domestically-produced and imported. All 52 producer goods are, in principle, capable of being imported.

Factors of production

The mobility of factors of production is a critical feature of any general equilibrium system. 'Mobility' is used here to mean mobility across economic activities (industries), rather than geographical mobility. When the factor mobility built into the model was more incredible, the greater the economy's simulated capacity to respond to changes in the economic environment. Assumptions about the mobility of production factors must be consistent with the length of run that the model is intended to represent [8, 15, 20].

Four types of labor are identified: farmers, operators, administrators, and professionals. All four types of labor are assumed to be fully mobile across all sectors. The four types are partially substitutable for one another, but the proportions in which they are employed in the various sectors vary greatly. These assumptions imply that wages must be equal in all sectors for each of the four categories of labor, though wages for the four types of labor will differ and need not move together.

In every sector, it is assumed that there is constant elasticity of substitution (CES) production technology with diminishing returns to scale to variable factors alone. However, we introduce a sector-specific fixed factor in every sector to ensure constant returns to scale in production to all factors. We refer to the set of specific factors in the agricultural sectors as 'land' and the set of those in the non-agricultural sectors as 'fixed capital.' The assumption of constant returns means that all factor demand functions are homogeneous of degree one in

output. There is a zero profit condition in each sector, which equates the price of output to the minimum unit cost of production. This condition can be thought of as determining the price of the fixed factor in that sector [8, 32-35].

Length of run

The model can be operated in the short-run. In the *short-run model*, there are two kinds of mobile capital - one that is mobile among agricultural sectors, and another that is mobile among non-agricultural industries. It is assumed that mobile agricultural capital cannot be used outside agriculture, and mobile non-agricultural capital cannot be used in agriculture. In this treatment, agricultural capital is thought of as tractors of various kinds, which can be used in various agricultural activities. Non-agricultural mobile capital is thought of as industrial machinery and buildings.

Households

The model contains ten major household categories - seven rural and three urban - differentiated by socio-economic group, as identified in the 2005 SAM. The income sources of each of these household types depend on their ownership of production factors and are estimated from the household income and expenditure survey called SUSENAS. The households are described as follows:

- 1) Agricultural employees- Agricultural workers who do not own land.
- 2) Small farmers - Agricultural workers with land < 0.5 ha.
- 3) Medium farmers - Agricultural workers with land 0.5 ~ 1 ha.
- 4) Large farmers - Agricultural workers with land >1 ha.
- 5) Rural low income - non-agricultural households, consisting of small retail store owners, small entrepreneurs, small personal service providers, and clerical and manual workers in rural areas.
- 6) Rural non-labor households, consisting of non-labor force and unclassified households in rural areas.
- 7) Rural high-income - non-agricultural households consisting of managers, technicians, professionals, military officers, teachers, large income entrepreneurs, large income retail store owners, large income personal service providers, and skilled clerical workers in rural areas.
- 8) Urban low-income households consist of small-income retail store owners, small income entrepreneurs, small income personal service providers, and clerical and manual workers in urban areas.
- 9) Urban non-labor households, consisting of non-labor force and unclassified households in urban areas.
- 10) Urban high-income households, consisting of managers, technicians, professionals, military officers, teachers, large income entrepreneurs, large income personal service providers, and skilled clerical workers in urban areas

Policy Simulations

In response to the global economic crisis in 2009, the West Java government introduced some policies to strengthen Indonesia's structure. The government cut income tax for corporations and individuals by 6.67 percent and 3.37 percent, respectively. Moreover, the

government also reduced the electricity price for the industry by 3 percent. The Central Bank of Indonesia also supported these government interventions by lowering the interest rate as much as 300 basic points. It is expected that all of these policies would be enough to minimize the impact of the global economic crisis on the West Java industry. To measure such stimulus policies, the possible impact of fiscal and monetary policies, we introduce three scenarios/simulations on the CGE model. Those scenarios are reduction of the interest rate by 3 percent (SIM 1), reducing income tax for corporations and individuals by 6.67 percent, and 3.37 percent, respectively (SIM 2), and an electricity price discount for the industry sector by 5 percent (SIM 3).

Short-run closure

The current account deficit is assumed to be endogenous, meaning that its size can change with the shocks' impact. The short-run thus depicts a period short enough that imbalances in Indonesia's external account can occur without the necessity of adjustments aimed at eliminating them. This assumption implies corresponding capital inflows or outflows. For example, if there is an increased current account deficit, there must be an increased capital inflow in the form of the debt instruments needed to finance the external deficit. The treatment of the capital stock and the stock of land areas described under 'length of run'. Each of the four categories of labor is mobile, but the total stock of labor is exogenously fixed. Government expenditure is exogenously determined.

3. RESULTS AND DISCUSSION

In general, Table 1 shows all simulations are expected to improve West Java macroeconomic performance. National output, average capital rental, real wages, investment, and consumption, are expected to increase. Even though nominal Gross Domestic Product (GDP) is expected to be negatively affected by the reduction of electricity price (SIM 3), but in terms of real GDP, SIM 3 has a positive impact. The negative impact on nominal GDP is caused by a negative Consumer Price Index (CPI). Electricity price discount is expected to decrease CPI by a minimal magnitude.

Table 1. The Impact on Macroeconomic Indicators.

Description	SIM 1	SIM 2	SIM 3
GDP price index, expenditure side	0.3678	4.2312	-0.0002
Average capital rental	0.3942	8.0317	0.0004
Average real wage of administration labor	0.4913	7.7621	0.2478
Average real wage of farmer labor	-0.1498	5.5410	0.1665
Average real wage of operator labor	-0.0982	7.2679	0.1261

Average real wage of professional labor	0.1907	8.7141	0.2775
Consumer price index	0.2144	3.5412	-0.0227
Aggregate payments to land	0.0589	9.0242	0.1437
Real GDP from expenditure side	0.0323	1.3334	0.1102
Import volume index, duty-paid weights	0.5094	12.508	0.0667
Aggregate real investment expenditure	1.3734	6.9826	0.1162
Real household consumption	0.0810	5.6204	0.1099
Export volume index	-0.6507	-2.8218	0.0676

Note:

SIM 1: Interest rate reduction by 3 percent

SIM 2: Corporate tax rate and Individual income tax reduction by 6.67 percent and 3.3 7 percent respectively

SIM 3: Electricity price discount for industry sector by 5 percent

In terms of magnitude, reducing the corporate tax rate and individual income tax will have a more massive positive impact than other simulations. By introducing a tax reduction policy, real GDP will grow by 1.33 percent, much larger than SIM 1 by 0.03 percent and SIM 3 by 0.11 percent. The result is relevant since tax is one of the most significant burdens for corporations and households. If the government decreases the tax rate, the real household wage for all categories of factors will rise higher than inflation (CPI).

These conditions will make households have greater purchasing power, and so will increase their real consumption. Moreover, a lower tax rate will also improve the investment climate, which will increase imports and reduce exports. Thus, net exports will be negatively affected, but the magnitude is still smaller than other GDP components changes. The West Java government should anticipate the negative response of net exports by increasing industrial efficiency so the West Java industry could produce commodities with cheaper production costs per unit. Therefore industry competitiveness will increase both in the domestic and international markets [8, 20-25].

Table 2. The Impact on Industrial Output.

No	Industry	SIM 1	SIM 2	SIM 3
1	Cooking oil made of animal and vegetable oil	-0.156	0.283	-0.072
2	Rice	0.057	4.122	0.051
3	All kinds of flour made of other grains and roots	-0.079	3.267	0.049
4	Macaroni, spaghetti, noodle, and the like	0.041	6.125	0.072

5	Sugar	-0.193	-5.223	-0.027
6	chocolate and sugar confectionery	-0.090	0.550	-0.017
7	Peeling and cleaning of coffee	0.023	3.079	0.034
8	Processed tea	-0.072	0.815	0.062
9	Processed soybean	0.055	4.624	0.061
10	Prepared animal feeds	-0.037	-0.663	0.002
11	Other foods	-0.136	-0.465	-0.006
12	Beverages	-0.005	3.496	0.073
13	Tobacco and Cigarettes	0.033	5.197	0.073
14	Yarn and cloth	-0.309	7.257	0.511
15	Wearing Apparel	-0.219	2.008	0.095
16	Products of leather	-0.339	3.746	0.101
17	Footwear	-0.349	3.284	0.144
18	Products of wood	-0.078	0.656	0.016
19	Pulp and paper	-0.275	7.437	0.236
20	Printed product	-0.052	0.512	0.028
21	Basic chemical	-0.225	8.142	0.093
22	Fertilizer	-0.091	0.021	0.004
23	Pesticide	-0.170	2.403	0.103
24	Oil Refinery	0.033	-3.055	-0.135
25	LNG	-0.153	-5.169	0.029
26	Products of rubber	-0.295	2.789	0.004
27	Products of plastic	-0.057	5.773	0.169
28	Ceramic, glass, and products of glass	0.324	3.957	0.271
29	Cement	0.987	5.339	0.240
30	Products of iron and steel	0.046	-1.015	0.407
31	Products made of other than iron and steel	-0.259	8.913	0.130
32	Other product made of iron and steel	0.352	0.656	0.254

33	Machinery and Equipment	-0.087	14.415	0.068
34	Electrical product, communication, and equipment	-0.145	18.554	0.298
35	MachToolOpt	-0.180	-7.959	0.012
36	Ship and Repair of Ship	-0.151	-1.578	0.020
37	Motorcycles	0.025	3.110	0.102
38	Automotive except motorcycles	-0.145	9.867	0.037
39	Other industry	-0.258	-4.752	0.276

Note:

SIM 1: Interest rate reduction by 3 percent

SIM 2: Corporate tax rate and Individual income tax reduction by 6.67 percent and 3.3 7 percent respectively

SIM 3: Electricity price discount for industry sector by 5 percent

Table 2 shows the impact of the three stimulus policies on industrial output. In general, the reduction of interest rate is expected to decrease the output of most sectors. Meanwhile, tax reductions and the electricity price discount policy are expected to increase most industries' output. This situation means that the West Java industry is not responsive to interest rate changes. Lower interest rates should be responded to by higher incentives for the industry to borrow more money from banks to expand their businesses. Thus, the output of the industry should increase. However, these transmissions do not exist in the West Java industry because most industries use more labor relative to capital. In other words, most West Java industries are labor-intensive industries [2, 8, 23-26].

Next, the impact of tax cuts and the electricity price discount is expected to increase most sectors' output. In line with the previous argument, both tax payments and electricity prices are burdens for enterprises; thus, these two policies will increase the industry's performance. However, some sectors experience negative impacts due to factor mobility to a sector with higher output. It is important to note that in this CGE model, we assume that factors are fully employed and mobile. Moreover, the table only covers 39 out of 52 sectors used in the model, including agriculture, mining, and minerals, trade, transportation, and services.

Table 3. The Impact on Output Price.

No	Industry	SIM 1	SIM 2	SIM 3
1	Cooking oil made of animal and vegetable oil	0.043	6.313	0.025
2	Rice	0.155	9.064	0.107
3	All kinds of flour made of other grains and roots	0.116	4.675	0.023
4	Macaroni, spaghetti, noodle, and the like	0.171	5.671	0.034

5	Sugar	0.119	6.762	0.051
6	chocolate and sugar confectionery	0.104	5.736	0.053
7	Peeling and cleaning of coffee	0.182	9.383	0.108
8	Processed tea	0.141	7.823	0.002
9	Processed soybean	0.179	8.253	0.08 1
10	Prepared animal feeds	0.150	6.185	0.073
11	Other foods	0.131	6.754	0.045
12	Beverages	0.183	6.038	0.015
13	Tobacco and Cigarettes	0.199	6.964	0.032
14	Yarn and cloth	0.091	4.519	-0.135
15	Wearing Apparel	0.066	6.791	-0.010
16	Products of leather	0.128	4.983	0.007
17	Footwear	0.082	6.290	-0.019
18	Products of wood	0.123	6.938	0.009
19	Pulp and paper	0.089	3.097	-0.063
20	Printed product	0.087	7.173	0.042
21	Basic chemical	0.051	3.834	0.000
22	Fertilizer	0.060	4.819	0.014
23	Pesticide	0.082	2.902	-0.045
24	Oil Refinery	0.160	4.837	-0.126
25	LNG	0.027	0.912	-0.005
26	Products of rubber	0.084	6.036	0.011
27	Products of plastic	0.109	4.383	-0.050
28	Ceramic, glass, and products of glass	0.265	5.537	-0.102
29	Cement	0.496	7.442	-0.349
30	Products of iron and steel	0.173	4.400	-0.087
31	Products made of other than iron and steel	0.068	4.872	-0.013
32	Other product made of iron and steel	0.226	2.361	-0.082

33	Machinery and Equipment	0.111	1.95 1	-0.006
34	Electrical product, communication, and equipment	0.134	-0.073	-0.085
35	MachToolOpt	0.067	2.340	0.012
36	Ship and Repair of Ship	0.040	6.045	0.002
37	Motorcycles	0.195	3.837	-0.014
38	Automotive except motorcycles	0.119	1.519	0.014
39	Other industry	0.080	2.676	-0.044

Note:

SIM 1: Interest rate reduction by 3 percent

SIM 2: Corporate tax rate and Individual income tax reduction by 6.67 percent and 3.3 7 percent, respectively

SIM 3: Electricity price discount for industry sector by 5 percent

Table 3 shows the impact of simulations on output prices. It is expected that nearly all output prices will increase as a response to interest rate reduction and tax cut policy. Consequently, both simulation one and simulation two will result in a higher Consumer Price Index (inflation). Conversely, the reduction in electricity prices for all sectors by 5 percent will negatively impact most sectors' output prices. Therefore, simulation three will result in negative inflation (deflation), as we can see in the previous table.

Table 4. The Impact on Labor Absorption.

No	Industry	SIM 1	SIM 2	SIM 3
1	Cooking oil made of animal and vegetable oil	-0.292	0.347	-0.151
2	Rice	0.092	5.989	0.030
3	All kinds of flour made of other grains and roots	-0.123	4.369	0.020
4	Macaroni, spaghetti, noodle, and the like	0.061	7.641	0.066
5	Sugar	-0.252	-7.613	-0.077
6	chocolate and sugar confectionery	-0.160	0.782	-0.046
7	Peeling and cleaning of coffee	0.045	5.376	0.047
8	Processed tea	-0.127	1.265	0.098
9	Processed soybean	0.099	7.872	0.093
10	Prepared animal feeds	-0.080	-1.748	-0.018

11	Other foods	-0.197	-1.272	-0.052
12	Beverages	0.002	4.079	0.062
13	Tobacco and Cigarettes	0.05 1	6.563	0.056
14	Yarn and cloth	-0.423	9.494	0.667
15	Wearing Apparel	-0.281	2.031	0.081
16	Products of leather	-0.389	4.058	0.097
17	Footwear	-0.420	3.609	0.150
18	Products of wood	-0.131	0.942	0.011
19	Pulp and paper	-0.437	11.704	0.365
20	Printed product	-0.117	0.852	0.041
21	Basic chemical	-0.277	9.759	0.078
22	Fertilizer	-0.122	-0.506	-0.030
23	Pesticide	-0.238	2.515	0.078
24	Oil Refinery	0.058	-5.453	-0.263
25	LNG	-0.299	-10.070	-0.054
26	Products of rubber	-0.388	3.141	-0.037
27	Products of plastic	-0.069	7.346	0.189
28	Ceramic, glass, and products of glass	0.460	4.765	0.326
29	Cement	1.432	6.965	0.295
30	Products of iron and steel	0.067	-1.979	0.509
31	Products made of other than iron and steel	-0.332	11.123	0.133
32	Other product made of iron and steel	0.526	0.198	0.3 16
33	Machinery and Equipment	-0.103	17.736	0.054
34	Electrical product, communication, and equipment	-0.187	24.237	0.356
35	MachToolOpt	-0.258	-12.227	-0.042
36	Ship and Repair of Ship	-0.232	-3.368	-0.027
37	Motorcycles	0.048	4.083	0.103

38	Automotive except motorcycles	-0.158	10.671	0.03 1
39	Other industry	-0.337	-7.022	0.324

Note:

SIM 1: Interest rate reduction by 3 percent

SIM 2: Corporate tax rate and Individual income tax reduction by 6.67 percent and 3.3 7 percent, respectively

SIM 3: Electricity price discount for industry sector by 5 percent

Next, we analyze the impact of both monetary and fiscal policies on labor. Expansionary monetary policy is expected to decrease labor absorption in the negatively affected sectors in terms of output, for instance, rice, peeling and cleaning of coffee, processed soybean and tobacco, and cigarettes. The result is relevant since the reduction of output will force sectors to reduce their factor utilization. Consequently, a sector will demand less labor, and this distorts the labor market.

However, labor from these sectors will be utilized by other sectors that are positively affected by the policy. Previously, in the analysis, it was already mentioned that it only presents 39 out of 52 sectors used in the model. Thus, even though labor absorption in the industry sector is expected to decrease labor absorption for other sectors, services will increase. In simulation 2, the tax cut is expected to increase labor absorption in almost all sectors with significant magnitude. In aggregate, these results indicate a relatively more massive impact on the national output to other simulations [8, 26-31].

In this CGE model, it is also possible to analyze the impact of fiscal and monetary policies on imports and exports for specific sectors. Table 5 shows the impact of three simulations on the export for 39 commodities. The reduction of interest rate is expected to decrease exports of all manufacturing commodities. The result is relevant since the previous result (Table 3) suggests that monetary policy will increase output prices, which will reduce the competitiveness of domestic commodities. The impact of the other two simulations on exports is expected to vary across sectors. Some sectors have better export performance and others that experience a negative impact by an interaction between changes in the production and output prices.

Table 5. The Impact on Exports.

No	Industry	SIM 1	SIM 2	SIM 3
1	Cooking oil made of animal and vegetable oil	-0.248	2.058	-0.141
2	Rice	-0.800	-12.354	-0.553
3	All kinds of flour made of other grains and roots	-1.03 1	17.738	-0.207
4	Macaroni, spaghetti, noodle, and the like	-1.522	8.879	-0.300
5	Sugar	-0.64 1	-0.494	-0.275
6	chocolate and sugar confectionery	-0.234	2.091	-0.118

7	Peeling and cleaning of coffee	-0.407	-6.076	-0.243
8	Processed tea	-0.3 16	-2.583	-0.004
9	Processed soybean	-0.690	-6.109	-0.3 13
10	Prepared animal feeds	-0.578	1.873	-0.281
11	Other foods	-0.506	-0.326	-0.175
12	Beverages	-0.409	1.415	-0.034
13	Tobacco and Cigarettes	-0.767	-1.136	-0.125
14	Yarn and cloth	-0.659	15.617	0.979
15	Wearing Apparel	-0.48 1	-0.875	0.074
16	Products of leather	-0.989	12.987	-0.055
17	Footwear	-0.634	2.929	0.149
18	Products of wood	-0.738	-1.609	-0.055
19	Pulp and paper	-0.492	19.651	0.349
20	Printed product	-0.477	-2.765	-0.229
21	Basic chemical	-0.334	18.403	-0.002
22	Fertilizer	-0.390	12.013	-0.091
23	Pesticide	-0.534	24.452	0.294
24	Oil Refinery	-0.656	-19.784	0.513
25	LNG	-0.153	-5.169	0.029
26	Products of rubber	-0.625	4.703	-0.081
27	Products of plastic	-0.805	16.969	0.375
28	Ceramic, glass, and products of glass	-1.963	8.407	0.755
29	Cement	-3.677	-5.730	2.588
30	Products of iron and steel	-1.280	16.841	0.648
31	Products made of other than iron and steel	-0.508	13.339	0.099
32	Other product made of iron and steel	-1.680	-17.520	0.608
33	Machinery and Equipment	-0.887	37.655	0.050
34	Electrical product, communication, and equipment	-0.752	37.759	0.478

35	MachToolOpt	-0.532	-18.673	-0.095
36	Ship and Repair of Ship	-0.344	5.335	-0.018
37	Motor cycles	-1.665	24.162	0.120
38	Automotive except motor cycles	-1.019	43.940	-0.122
39	Other industry	-0.595	-19.858	0.324

Note:

SIM 1: Interest rate reduction by 3 percent

SIM 2: Corporate tax rate and Individual income tax reduction by 6.67 percent and 3.3 7 percent, respectively

SIM 3: Electricity price discount for industry sector by 5 percent

Table 6. The Impact on Imports.

No	Industry	SIM 1	SIM 2	SIM 3
1	Cooking oil made of animal and vegetable oil	0.3282	33.6886	0.1945
2	Rice	0.6354	36.6517	0.4327
3	All kinds of flour made of other grains and roots	0.6393	28.1725	0.1944
4	Macaroni, spaghetti, noodle, and the like	1.0960	39.5387	0.2834
5	Sugar	0.2458	14.4022	0.1415
6	chocolate and sugar confectionery	0.5926	32.7 133	0.3200
7	Peeling and cleaning of coffee	1.1343	58.9046	0.6819
8	Processed tea	0.83 14	46.1669	0.1047
9	Processed soybean	1.1445	53.9746	0.5452
10	Prepared animal feeds	0.3008	12.7559	0.1505
11	Other foods	0.6928	36.3147	0.2885
12	Beverages	1.0625	38.4170	0.1713
13	Tobacco and Cigarettes	0.4163	18.3799	0.1369
14	Yarn and cloth	0.5294	28.2213	-0.4903
15	Wearing Apparel	0.5263	46.4698	0.0684
16	Products of leather	0.3029	21.4787	0.1346

17	Footwear	0.5316	39.7775	0.0344
18	Products of wood	1.1189	28.8471	0.1098
19	Pulp and paper	0.0999	12.4891	0.0019
20	Printed product	0.4105	34.4668	0.2475
21	Basic chemical	-0.1205	4.1670	0.2259
22	Fertilizer	0.1650	14.5442	0.0698
23	Pesticide	0.1934	7.7580	-0.0767
24	Oil Refinery	0.2557	6.3367	-0.2139
25	LNG	-0.0781	-2.6460	0.0146
26	Products of rubber	0.3131	16.1818	0.1008
27	Products of plastic	0.579 1	24.2653	-0.0743
28	Ceramic, glass, and products of glass	1.6126	24.4689	-0.2089
29	Cement	3.0683	33.9412	-1.1777
30	Products of iron and steel	0.9364	11.2462	0.0592
31	Products made of other than iron and steel	0.1255	15.7614	0.1421
32	Other product made of iron and steel	1.4974	12.6457	-0.1114
33	Machinery and Equipment	0.75 18	11.1433	0.0850
34	Electrical product, communication, and equipment	0.4662	11.8753	-0.0176
35	MachToolOpt	0.3168	10.5057	0.1582
36	Ship and Repair of Ship	0.5177	4.6759	0.0813
37	Motorcycles	0.6589	15.5777	0.0491
38	Automotive except motorcycles	0.4953	8.8923	0.0975
39	Other industry	0.2325	9.9354	0.0556

Table 6 suggests that both monetary and fiscal policies will increase imports of manufacturing sectors. It is expected that an increase in real household consumption will result in higher demand for manufacturing commodities. However, the increasing demand for commodities cannot fully be supplied by domestic commodities, reflected in the small increase in output in Table 2. As a result, Indonesia must import more manufacturing commodities to satisfy demand. In terms of magnitude, simulation two will have a higher

impact on imports, which is an increase of 4 percent up to 58 percent for specific commodities.

4. CONCLUSION

The government and Central Bank intervention through fiscal and monetary policy is expected to increase West Java's economic performance. The situation means that both fiscal and monetary policies are quite powerful to minimize external and internal shocks' impact. However, the policymakers need to consider some issues based on the results of the CGE model simulation. The first issue is regarding the scale or magnitude of intervention. If the impact of internal or external shocks on the West Java economy is quite significant, the government should intervene at a reasonable scale. The second issue is the types of policy tools that are used. Simulation 2 and Simulation 3 show that fiscal policy with different tools will result in different impacts. It will depend on the transmissions that have occurred. Third, the result of simulation 1 suggests that the West Java industry is not so responsive to changes in the interest rate.

This simulation means that fiscal policy is still preferable to improve the real sector relative to monetary policy. Finally, the government should be aware of West Java's industry competitiveness. Most industrial sectors respond negatively in terms of exports and imports. Moreover, it is also expected that the domestic market will have many more imported commodities as West Java's real household consumption increases.

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