

The role of inter-household transfers in mitigating the impact of economic shocks on income distribution in Indonesia

Wisnu Winardi

BPS-Statistics Indonesia, Jl. dr. Soetomo 6-8 Jakarta 10010, Indonesia

Tel.: +62 21 3841195 (7310); E-mail: wisnuw@bps.go.id; wisnu.winardi@gmail.com

Abstract. COVID-19 outbreak has triggered many economic shocks globally. In this study we estimate the role of inter-households transfer in mitigating the impacts of the outbreak on Indonesian economy using a CGE model. The result shows that commodity prices and enactment of physical distancing measures bring negative impacts on the economy. Government response by lowering direct tax rates and increasing transfer to households could not fully compensate the impacts but enlighten it slightly. Households response by increasing inter-household transfers helps the government policy, particularly in reducing the decrease of households' income and consumption. The result indicates that inter-household transfer could be regarded as an effective instrument to improve the household income distribution quality and reduce the poverty. Regarding that, stakeholders in the economy should improve the collaborative policies to capitalize the policy instruments optimally. Furthermore, the result also indicates that household consumption is not a sustainable engine to boost the economic growth. Prioritizing consumption over saving in the long run could lead to inability of the economy to engage a self-financed investment.

Keywords: Economic shocks, inter-household transfers, income distribution

1. Introduction

The dynamic movement of the global economy often creates shocks for the national economy. The impacts carried by those external shocks vary from mild to severe. One of the external shocks that is currently taking place and bringing big impacts ubiquitously is COVID-19 pandemic.

The outbreak that began in Wuhan City, Hubei Province, China in December 2019, at the beginning of the incident had a major influence on China and its partner economies and impacted on the decrease of global trade, global demand and output, and world commodity prices. At the next stage, COVID-19 also rapidly affected wider economies, including Indonesia.

First COVID-19 case detected in Indonesia in early March 2020, contracted by two residents living in Depok, a satellite city south of Jakarta. Not long after that, the number of residents which were positively infected increased rapidly. According to official data

from the government, as of June 29, 2020, there were 55,092 people positively infected, 23,800 patients recovered, and 2,805 dead. Those cases were spread in 34 provinces and 496 municipalities/cities [1]. By considering the virus high transmissibility and unavailability of the vaccines and relevant medicine, the government implemented physical distancing as a preventive measure to slow down the virus spread.

This measure brings decelerating impacts on economic aspects, ranging from activities of production and distribution, consumption, investment, and international trade, to income. Physical distancing reduces business capacity to invest and operate, hampers capacity of households to consume goods and services, and holds back residents' transactions with foreign counterparts which leads to lower institutions' income.

As an effort to cope with the impact of the coronavirus outbreak, the government issued fiscal stimulus policies by refocusing the government budget to be more accommodating the needs for health and social

assistance. Besides, income taxes were loosened and transfers to households and the business sectors were increased to maintain the consumption [2].

In line with the government efforts, other institutions such as businesses, non-profit institutions, and households also take part in the efforts by raising funds and donating aid in the form of cash, food, medical supplies, etc. to hospitals, medical teams, security personnel and related workers and as well as community members in need.

In this regard, this paper attempts to discuss the potential impacts of various economic shocks caused by COVID-19, which consists of decreased world commodity prices, physical distancing, government stimulus package, and increased inter-household transfers on Indonesian economy. The discussion will emphasize on the impact of inter-households transfer on income distribution, by considering that research in this topic is relatively scarce, despite the long history of the role of inter-households transfers in society.

2. Literature review

Impact of pandemic on the economy topics have been investigated by researchers by using various analysis tools. Chen et al. [3, pp. 281–293] studied the impact of SARS outbreak on Taiwan stock market during the outbreak period in 2003 by applying the GARCH method. Hussain et al. [4, pp. 585–589] analyzed the potential cost of food safety outbreak in the United States utilizing some examples of outbreak. Macciocchi et al. [5, pp. 287–289] analyzed short-term impact of Zika virus outbreak on Latin American and Caribbean countries (LCR) markets using variations of the market index and linear regression model. Hossain et al. [6, pp. 585–589] conducted cross-sectional study of chikungunya outbreak in Bangladesh by using multivariate analysis based on clinical and socio-economic patient data. Dewi et al. [7, pp. 77–85] estimated total economic losses caused by Surra outbreak in Sumba Timur-Indonesia by calculating direct cost, indirect cost, and the other expenditure cost based on primary and secondary data.

Those research in general discussed the impact of outbreaks on specific aspects of the economy. Other research studied the impact on wider economic aspects by utilizing computable general equilibrium (CGE) models. Diao et al. [8, pp.145–158] assessed the potential economy wide impact of HPAI outbreak using the dynamic CGE model for Nigeria. Thurlow [9, pp. 276–288] analyzed avian flu impact on economic growth

and poverty using dynamic CGE model of Kenya. The research indicate that supply and demand shocks caused by avian influenza affect income from poultry production significantly and increase the risk of poverty for poultry farmers. However, the effects of the outbreaks on economic growth are limited, since poultry shares to the economies are relatively small. Smith et al. [10, pp. 1400–1408] estimated the potential macroeconomic impact of influenza pandemic (H1N1) in Thailand, South Africa and Uganda using comparative static single-country CGE models. The research indicates that effect of influenza outbreaks on labor-intensive sectors is large, but in overall the effect of the outbreaks on the economies are relatively small. Prager et al. [11, pp. 1–19] analyzed the total economic consequence of potential influenza outbreak in the United States by utilizing the static CGE model for the US. The research highlights the importance of vaccination and other actionable activities could be done by the stakeholders to reduce potential economic losses from the outbreaks. Very recently, Center for Sustainable Development Goals Studies [12] measured the real economic cost of COVID-19 pandemic in Indonesia using inter-regional CGE model entitled IndoTERM, combined with simple cost benefit analysis. The analysis concluded that strong intervention through effective large-scale social restrictions could reduce economic growth in the short run but could lead to higher economic growth than the weak intervention in the long run.

3. Methodology

Learning from previous research and aligning with the research objectives, this study uses the CGE model to estimate impacts of various shocks which were mainly caused and triggered by COVID-19 on Indonesian economy. The use of CGE model in this research is based on consideration that the model could cover many economic issues and integrate microeconomic and macroeconomic perspectives, and has the capability to formulate it well. CGE model also did not require up-to-date, long, and consistent series data which are commonly unavailable in developing countries, including Indonesia [13]. The model is combination of economic theories and economic data which formulated in large numerical equations to measure the impacts of policies or shocks in the economy [14].

However, despite those advantages, CGE model shares the feature of a deterministic model, which does

Table 1
Simulation scenarios

Economic shocks	Treatment on the model
1. Scenario I: commodity prices shock	The changes of world commodity prices: <ul style="list-style-type: none"> – Food crop prices increase by 8 percent – Estate crop prices increase by 8 percent – Oil mining and manufacturing industry prices decrease by 43 percent – Gas mining and manufacturing industry prices decrease by 18 percent – Coal mining and manufacturing industry prices decrease by 17 percent – Metals and minerals mining prices decrease by 13 percent
2. Scenario II: scenario I and enactment of physical distancing	The world commodity prices change and the economy works at 88 percent of its normal capacity.
3. Scenario III: scenario II and government stimulus	The world commodity prices change, economy works at 88 percent of its normal capacity, and government issues fiscal stimulus: <ul style="list-style-type: none"> – Increased of government transfer to households in <ol style="list-style-type: none"> a. agricultural labor by 27 percent b. agricultural employer by 51 percent c. non-agricultural rural low category by 44 percent d. rural non-labor by 12 percent e. non-agricultural rural high category by 33 percent f. non-agricultural urban low category by 105 percent g. urban non-labor by 49 percent h. non-agricultural urban high category by 241 percent – Increased of central government transfer to local government by 3 percent – Decreased of direct tax rates of corporation by 22 percent The value of increased of government transfer rates and decreased of direct tax rates is estimated using comparison between value of government stimulus for transfers and taxes in 2015 prices and its benchmark value represented in the SAM. In increasing transfer rates and reducing direct text rates, government assumed to keep its real consumption level.
4. Scenario IV-VII: scenario III and changes in inter-household transfers	The changes of world commodity prices, economy works at 88 percent of normal capacity, and issues fiscal stimulus and increase of inter-household transfer rates by 10 percent (scenario IV), 25 percent (scenario V) and 50 percent (scenario VI). In increasing the inter-household transfer rates, households assumed to keep the value of consumption proportional to its income by considering that household consumption growth in Indonesia is very close to economic growth.

not fully cover all economic circumstances in depicting the phenomena. Besides, CGE models are quantitative yet theoretical and not empirical in the sense of econometric modeling [15].

The model used in this study is the development of the previous model used to study the impact of inter-households transfers on the economy in Indonesia [16, pp. 1–12], which is a modified version of the original model introduced by Hosoe et al. [17]. The model is static and classified as a neoclassical class model that describes analysis of long-term impacts. The model assumed that Indonesia is a small country in the global competition, all markets in the economy are at perfect competition condition, production process tends to have constant return to scale, and endowment factors in the economy are fixed, immobile and work at full capacities.

The model is homogeneous of degree zero in prices that achieve balance condition by adjustments in commodity and production factor prices and exchange rate.

Total income of each row in the SAM data is equal to its total column and total of GDP by production is equal to total of GDP by expenditure in current prices. In overall, the model consists of 40 blocks of equation and variables with 4,603 single equations and variables. The model solution is carried out by maximizing the sum of household Hicksian equivalent variation using non-linear model.

The main data used in this study is the 2015 Indonesian social accounting matrix (SAM) which is the updated data of official 2008 Indonesian SAM, the latest edition of official data that is available up to now. SAM is one of satellite accounts that record interplay between social and economic aspects of the compiling economy and is very widely used as a database of CGE models. An update of the SAM is needed to describe a more current structure of the Indonesian economy in order to be able to depict current Indonesia's economic characteristics which is quite different from 2008 period due to changes such as production technology and subsidy

Table 2
Impact of Economics Shocks Caused by COVID-19 on Macroeconomic Indicators (Percent)

Macroeconomic indicators	Scenario					
	I	II	III	IV	V	VI
1. Export	-1.38	-13.84	-14.41	-14.43	-14.46	-14.51
2. Import	1.78	-11.26	-11.78	-11.80	-11.83	-11.87
3. Net borrowing	2.76	1.47	0.92	0.89	0.86	0.81
4. Output price	-0.81	-1.80	-1.79	-1.79	-1.79	-1.80
5. Domestic price	-0.77	-1.73	-1.66	-1.66	-1.65	-1.65
6. Composite price	-1.00	-1.99	-1.98	-1.98	-1.98	-1.99
7. Household consumption	0.97	-9.87	-6.63	-6.52	-6.35	-6.06
8. Investment	-0.44	-17.21	-23.26	-23.47	-23.79	-24.32
9. Corporation income	-1.41	-16.12	-15.70	-15.69	-15.69	-15.67
10. Government income	-0.34	-10.24	-14.76	-14.76	-14.76	-14.75
11. Household income	-0.38	-12.01	-8.96	-8.86	-8.70	-8.44
12. Corporation saving	-1.41	-16.12	-13.02	-13.02	-13.01	-13.00
13. Government saving	0.32	-185.62	-601.01	-600.96	-600.88	-600.75
14. Household saving	-0.41	-12.30	-9.75	-10.69	-12.10	-14.47

Source: simulation result.

allocation that have impacted government saving and the current account balance.

The updated 2015 SAM consists of 55 accounts of production activities, 2 accounts of production factors (labor and capital), 2 accounts of net direct taxes and net import tariffs, 1 capital account, and 11 institutional accounts (8 household accounts, 1 corporation account, 1 government account, and 1 rest of the world account). In the updated SAM, the inter-household submatrix describes the inter-household transfers between the household groups in the household account. This household sub matrix describes something for nothing transactions between households, which means that one household intentionally gives cash, goods or services to the other but does not expect and receive a reward or return as a feedback.

In order to estimate the impact of the various shocks, this study simulates six scenarios as presented in Table 1.

Those simulations are designed to approximate the real economic phenomena as close as possible based on acquired information. However, due to dynamic circumstances, the information could be changed quickly, particularly that related to fiscal stimulus policy. In this context, the study uses the fiscal stimulus information as of June 16, 2020 [2].

4. Results and discussion

4.1. Impact of economic shocks on macroeconomic indicators

The decrease in oil, gas and coal mining and manufacturing prices has a negative impact on nominal ex-

ports, results in a deterioration of the exchange rate and a subsequent increase in nominal imports. In corollary, the model generates an increase in the current account deficit of 2.76 percent (see Table 2). However, the weakening of exchange rate is lower than the decrease of oil, gas, and coal mining and manufacturing prices, therefore output prices, domestic prices, and composite prices are decreased. The decrease of composite prices stimulates domestic final demands that are followed by increase of domestic output. Nevertheless, since the increase of domestic final demands is lower than the increase of composite prices, therefore the aggregate nominal output is decreased. The decrease of aggregate nominal output causes decreases of institutions' income and followed by decrease of institution's saving and leads to decrease of ability of the national economy to finance the investment from national resources.

Enactment of physical distancing measures which assumed to make the economy work at 88 percent of its normal capacity causes the decrease of all macroeconomic indicators' performance. Simulation result of scenario II in the form of commodity prices shock and enactment of physical distancing measures have impacts on the decrease of corporation, government and household incomes by 16.12 percent, 10.24 percent and 12.01 percent respectively, which following by the decrease of domestic final demand and institutions' saving, and decrease the output, domestic and composite prices.

Implementation of government fiscal stimulus that accompanies physical distancing measures reduces the negative impacts of previous economic shocks slightly (scenario III). The fiscal stimulus policy reduces the decrease of household income, consumption and saving,

Table 3
Impact of Economics Shocks Caused by COVID-19 on Household Income (Percent)

Group of households	Scenario					
	I	II	III	IV	V	VI
• Agricultural labor	0.07	-7.85	-0.18	0.48	1.48	3.15
• Agricultural employer	-0.30	-11.50	-7.38	-7.28	-7.15	-6.92
• Non-agricultural rural low category	-0.28	-11.20	-7.00	-6.84	-6.60	-6.20
• Rural non-labor	-0.32	-11.40	-10.31	-10.08	-9.74	-9.17
• Non-agricultural rural high category	-0.55	-13.11	-12.83	-12.82	-12.80	-12.77
• Non-agricultural urban low category	-0.33	-11.95	-6.86	-6.76	-6.62	-6.36
• Urban non-labor	-0.42	-12.25	-9.66	-9.56	-9.41	-9.16
• Non-agricultural urban high category	-0.51	-13.17	-12.06	-12.05	-12.04	-12.01
Total	-0.38	-12.01	-8.96	-8.86	-8.70	-8.44

Source: simulation result.

reduces the decrease of corporation income and saving, but also reduces government income and increases its debt and decreases the investment. Government policy in lowering direct taxes of corporations causes the decrease of government income by 14.76 percent. When it is combined with increasing transfers to households and local government and maintaining the consumption level, the value of government income would be smaller than the expenditure, therefore the government debt increases. The simulation result shows that the policy increases the government debt by 601.01 percent compared to the baseline value.

Household response by increasing the transfers to other household groups in the long-run only causes mild impacts on prices level and corporation and government income, but causes significant impacts in reducing of the decrease of household income and consumption and current account deficit caused by previous shocks (scenario IV–scenario VI).

The result indicates that increase of inter-household transfers potentially helps government fiscal stimulus in reducing the negative impacts of previous shocks. Simulation result also shows that the higher increase of inter-household transfer rates, the larger reduction of the decrease of household income and consumption, corporation and government income and saving, and current account deficit. For example, if the economy shocked by previous shocks, household income decreases by 6.63 percent, and if inter-household transfer rates increase by 10 percent, 25 percent and 50 percent, the household income estimated to be decreased by 6.52 percent, 6.35 percent and 6.06 percent respectively.

This is an interesting finding for Indonesia, as the country has good potency in inter-household transfer. Based on the CAF World Giving Index report 2019, Indonesia is the most improved country in increasing the overall index score compared with the last 10 years [18, p. 13]. There are inherited cultural and religion values

in Indonesia that suggest people to care for others, particularly by giving help or donation to the less advantaged people. For instance, in Islamic religion which adhered by majority of people in Indonesia, there are some donation schemes that could be used to implement the religious advice related to household transfers, such as zakat al-Fitr, zakat al-Mal, infaq and, sadaqah.

However, by assuming the same proportional change in household consumption and income, the increase in household income does not impact household saving. As a result, the economy could not improve its ability to finance the investment from domestic sources. This result indicates that a strategy to boost economic growth through household consumption does not result in sustained growth, because investment have to be met from foreign investment and debt, which in turn will lead to an increase in deficit on the primary income account. Since 2014 household consumption growth in Indonesia was very close with the economic growth and the economy experienced net borrowing transactions.

4.2. *Impact of economic shocks on household income distribution*

Considering in more detail, the impact on household income by household groups, the increase of inter-household transfers has a positive impact in reducing the decrease of household income for all groups of households (Table 3).

When the economy faces a decrease in commodity prices and physical distancing, the incomes of all household groups decrease, particularly households that live in urban areas and households in high income categories. Furthermore, if government implements a fiscal stimulus, the decrease of income for all group of households will be reduced, particularly agricultural labor, agricultural employer, non-agricultural rural low category and non-agricultural urban low category house-

holds which decrease from -7.85 percent to -0.18 percent, from -11.50 percent to -7.38 percent, from -11.20 percent to -7.00 percent, and from -11.95 percent to -6.68 percent respectively. Overall, the estimated fiscal stimulus results in a reduction in the decrease of household income caused by commodity prices and physical distancing shocks from -12.01 percent to -8.96 percent. Hereafter, if inter-household transfer rates increase by 10 percent, 25 percent, dan 50 percent, the decrease of household income is estimated to reduce to -8.86 percent, -8.70 percent, and -8.44 percent respectively.

The higher the increase of inter-household transfer rates, the larger the reduction of the decrease of household income for all groups, where the highest reduction is experienced by agricultural labor households. If commodity prices shock occurred, physical distancing enacted, and government fiscal stimulus implemented, agricultural labor households' income decreases by 0.18 percent, and if inter-household rates increases by 10 percent, 25 percent, and 50 percent, agricultural labor household income increase by 0.48 percent, 1.48 percent and 3.15 percent respectively. Other household groups experience reduction in the decrease of income.

The result indicates that inters-household transfer is an effective instrument to improve the quality of income distribution as the instrument could improve the level of household income for the poorer household groups, especially when the national economy is under pressure. The result also indicates that inter-household transfer has potential benefits to reduce poverty, since many poor people in Indonesia are living in rural areas and working in the agriculture industry.

Furthermore, if households increase their transfer activities to help other society members, their social solidarity and trust will also be improved accordingly, and in turn it could lead to the increase of social capital. In the long-run, strong growth in social capital combined with economic capital and human capital will strengthen the economic development and help the economy in achieving its development objectives. It is aligned with previous research conducted by Grootaert [19, p. 62] which concluded that social capital has positive correlation with household welfare in Indonesia.

5. Conclusions

Commodity prices and physical distancing shocks caused by COVID-19 have adverse impacts on Indone-

sian economy, i.e. a decrease in production of goods and services, a decrease in consumption, investment, and international trade, a decrease in institutions' income and saving, and an increase of current account deficit. The estimates also show that the largest adverse impact is caused by the physical distancing measure. physical distancing measures. Currently, physical distancing is one of the recommended measures in facing this contagious invisible enemy by hindering the virus contracting capacity. Nevertheless, from economic point of view physical distancing is not a sustainable solution since it limits the economy to work at its normal capacity.

Government response by reducing direct taxes and increasing transfers to households and corporations could not fully compensate for the adverse impacts, but could help to reduce it slightly. Hereinafter, households response by increasing inter-household transfer rates helps government policy in mitigating the impacts, particularly in the reduction of household income and consumption as well as corporation and government income.

When institutions have obstacle in generating income from the production activities, the distribution activity through transfers could be an alternative solution to maintain the economic flows. In this regard, collaboration of government authority in fiscal policy and society concern on inter-household transfer could be an effective asset in reducing the negative impacts and minimize the economic cost of COVID-19.

Accordingly, all stakeholders should strengthen the cooperation to improve the social solidarity and responsibility and capitalize it in order to be able to overcome the pandemic impacts and face other challenges in the economy.

From a statistical perspective, COVID-19 reveals the need for the accessibility and availability of up-to-date data to support studies, policies, and decisions making. Related to this study, availability of the up-to-date official data could improve reliability and accuracy of the simulation results.

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