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IS THE AUTOMATIC STABILIZER POLICY EFFECTIVE IN COMBATING AN ECONOMIC RECESSION? A CASE STUDY OF THE INDONESIAN STATE BUDGET

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ABSTRACT

This paper examines the effectiveness of an automatic fiscal policy in dealing with an economic recession in Indonesia. By using a mixture of quantity and quality approaches, we find that the automatic stabilizer policy can be used in Indonesian state finances, whereby several components of state revenue, namely income tax, consumption tax, excise, and non-tax revenue, have elasticity of more than one. In comparison, only one component of government spending, namely interest payment, has an elasticity of more than one. We also find that activating the automatic stabilizer policy requires a particular article in the State Finance Law, that regulates when the automatic stabilizer instrument, to be used. These findings open an additional avenue for understanding the effectiveness of policy stimulus to combat the COVID-19 pandemic.

Keywords: Automatic stabilizer; Discretionary fiscal policy; Public finance management; Economic recession.

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I. INTRODUCTION

The COVID-19 pandemic has had an enormous negative effect on social and economic activities around the world (see Phan and Narayan, 2020; Narayan, 2021). The COVID-19 pandemic has resulted in global and national economic contractions, caused job losses, and added to unprecedented poverty rates (Uddin, 2021). The pandemic has become a very wide and large economic shock wave and has impacted the economic system from both the supply side and the demand side. This resulted in the negative economic impact of the COVID-19 pandemic occurring in almost all economic sectors (see Narayan *et al.*, 2021). The magnitude of the negative impact of the COVID-19 pandemic has encouraged the government to increase its role through fiscal stimulus. The government must play an interventionist role to reduce the tremendous social and economic impact of COVID-19 especially on sustainable development (Khambule, 2021).

Almost all countries issued fiscal stimulus policies in the face of an economic recession caused by the COVID-19 pandemic. Japan provided a large fiscal stimulus to deal with its economic recession, namely as much as 20.0 percent of its total Gross Domestic Product (GDP) (see Figure 1). Australia, Malaysia, Singapore, and the United States implemented similar policies: the government issued a large fiscal stimulus (more than 10 percent of GDP).

Figure 1.

Fiscal Stimulus to Gros Domestic Product (GDP) Ratio in Various Countries

This figure shows the fiscal stimulus to PDB ratio in various countries during the pandemic. The data is sourced from Statista Bloomberg, 2020.

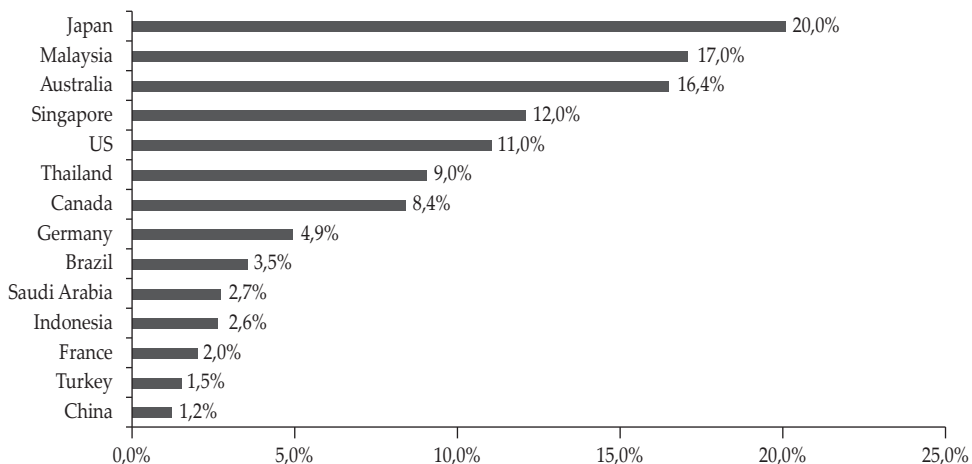


Figure 1 shows that, while the negative effect of COVID-19 on the economy is enormous, the fiscal stimulus issued by Indonesia is relatively minimal compared to other countries. During the pandemic, the Financial Technology (Fintech) and banking sectors experienced great shocks, and even banks experienced a vast decline in financial performance (Sapulette *et al.*, 2021).

This study makes two contributions. The first contribution is the enrichment of public policy perspectives and discussions regarding how to overcome crisis

problems, especially those arising from the COVID-19 pandemic. As a country that adheres to a countercyclical fiscal policy (Abdurohman and Resosudarmo, 2016), the small fiscal stimulus issued by the Indonesian government in response to the adverse effects of the COVID-19 pandemic is an unusual policy. Indeed, the government and the central bank have strengthened policy coordination (fiscal and monetary policy coordination) nationally to deal with the adverse effects of the COVID-19 pandemic (Rizvi *et al.*, 2021; Prabheesh *et al.*, 2021; Tsatsaronis *et al.*, 2022), and non-fiscal and monetary stimulus programs (Scale Social Restrictions), so that the fiscal stimulus policy becomes smaller than usual (Wicaksono and Uluwiyah, 2020).

Although the fiscal stimulus provided by the Indonesian government to deal with the COVID-19 pandemic was relatively small, the Indonesian economy recovered quickly. The World Bank (2022) estimated that in 2022 Indonesia's economic recovery after the COVID-19 pandemic will be even more robust. This fast recovery shows that the government's fiscal policy, supported by strong national policy coordination, has effectively dealt with the COVID-19 pandemic. The government implemented a reallocation strategy and increased the budget for social protection programs. This policy strategy is believed to accelerate the economic recovery process in Indonesia caused by the COVID-19 pandemic (Indrawati, 2021).

Having considered the above facts, Indonesia's fiscal policy phenomenon is fascinating to study. Amid a relatively small fiscal stimulus, Indonesia was able to make an economic recovery in relatively quick time compared to other ASEAN member countries.

The second contribution of this study is to enrich academic and empirical discourse on fiscal policy bias, especially related to the role of the automatic stabilizer fiscal policy. It is widely known that the government's fiscal policy response is divided into discretionary policy and automatic stabilization policy. In the Indonesian economy, the effectiveness of these two policies in influencing economic stability is still inconclusive. The leading cause of the stability of economic growth is still unclear, whether it comes from discretionary policies or automatic stabilization (Abdurohman and Resosudarmo, 2016).¹ This elusive cause of economic stability is not only specific to Indonesia, but to other developing countries. Empirical evidence shows that most developing countries, including Indonesia, have a policy bias for discretionary fiscal policies, which is reflected by the existence of pro-cyclical fiscal policies.² One hypothetical explanation for why

¹ Without considering the joint interaction of fiscal policy with other policies (e.g., monetary policy), there will be difficulty in deducing whether and to what extent fiscal policy can be used to obtain policy optimality. See also recent study by Juhro *et al.* (2022) examining the interaction of monetary and fiscal policy rules in Indonesia.

² Discretionary fiscal policy has several fundamental weaknesses compared to automatic stabilization fiscal policy. Implementing discretionary fiscal policy is relatively more difficult for countries that adhere to a democratic system because it will be influenced by the behavior of politicians with views and beliefs that differ from the government (Catrina, 2014). Attinasi and Klemm (2016) found the weakness of discretionary fiscal policy. Using data from 18 European Union countries from 1998-2011, they discovered that discretionary policies harmed short-term economic growth, and this negative impact occurs on the side of state revenues.

most developing countries tend to have pro-cyclical fiscal policies is the small role of automatic stabilizers (Akitoby *et al.*, 2004).³

In the context of Indonesia, Yuhertiana *et al.* (2015) conclude that discretionary policy is only a formality policy that creates moral hazard. The adverse effects of this discretionary policy have spread to local governments. Fiscal policy risk in local government also increases because it follows the risk of increasing central government discretionary policies (Romarina and Makhfatih, 2010). This study attempts to establish the possibility of an effective automatic stabilization fiscal policy as an alternative policy to discretionary fiscal policy in dealing with economic crises. Although Indonesia does not yet have regulations regarding the automatic stabilization fiscal policy, Indonesia already has these policy instruments (Indrawati, 2021). In the automatic stabilization fiscal policy, several budget components can be used as discretionary fiscal policy instruments. When the economy is in good shape, corporate and household incomes tend to rise, and unemployment tends to fall. As a result, tax revenues increase while spending on unemployment benefits falls. Conversely, when the economy is sluggish, household and corporate incomes decline, and unemployment rises, this leads to a decrease in tax revenues and an increase in government spending on unemployment benefits. These particular budget automatic responses are usually called automatic fiscal stabilizers.

An automatic fiscal stabilizer is defined as the government's budget reaction to economic fluctuations without intentional government action. Most automatic stabilizers are countercyclical. They induce a contractionary fiscal policy response in a boom and an expansionary response in a recession. Naturally, automatic stabilization instruments can play a direct role during times of economic crisis (Abdurohman and Resosudarmo, 2017).

Based on the goal of creating stability in the face of an economic recession, the concept of countercyclical policy, be it discretionary or automatic stabilizer, becomes very important. The government must effectively and efficiently manage the state budget through countercyclical policies in times of crisis. From this perspective, this study examines the effectiveness of the automatic fiscal stabilizer in dealing with the economic crises that occurred in Indonesia starting in the 1997/1998, 2008, and 2020 crises.

This study uses a mixture of quantitative and qualitative approaches, which, according to our knowledge, has not been widely used. The quantitative approach is used to estimate the effectiveness of the automatic stabilizer. At the same time, the qualitative approach is used to explore the possibility of implementing the automatic stabilizer fiscal policy in the form of government rules and administration. So far, there are limited studies on the making of regulations and the implementation of the automatic stabilizer fiscal policy. Therefore, we believe that the automatic stabilizer fiscal policy needs to be studied in depth not only by considering the size of its statistical and economic influence but also by considering the possibility that the policy can be implemented in binding regulations.

³ Suescun (2007) notes two fundamental elements that show the small role of automatic fiscal stabilizers in developing countries, namely (1) the relatively low portion of income tax in total tax collection and (2) the absence of unemployment benefits. Indonesia had had new unemployment benefits in the last two years when it entered the final period of the COVID-19 pandemic, and it has not been evenly distributed. Indonesia's fiscal policy likely lacks a countercyclical design.

The rest of the paper is organized as follows. Section II presents the literature review. Sections III and IV discuss the methodology and empirical findings, while Section V concludes.

II. LITERATURE REVIEW

The study of the effectiveness of government policies in economic development began to develop rapidly after John Maynard Keynes published his writings on the *General Theory of Employment, Interest, and Money*. Fiscal policy issued by the government has three main economic functions, namely allocation, distribution, and stabilization (Musgrave and Musgrave, 1989). The function of fiscal allocation is carried out through the policy side of state spending. Meanwhile, the distribution and stabilization functions can be carried out through tax policies and also through state spending policies. Through fiscal policy, the government can make countercyclical policies when economic conditions experience a recession or overheating (Seidman, 2003).

From an empirical perspective, fiscal policy can be categorized into three major groups, namely automatic stabilization, systemic fiscal discretion, and non-systemic fiscal discretion. The automatic stabilization policy and systemic fiscal discretion are aimed at dealing with fluctuating business cycle conditions. Meanwhile, non-systemic fiscal discretion is related to changes in government revenues and or expenditures that occur other than as a result of changes in the economic cycle (Fatas and Mihov, 2003).

The automatic stabilizer theory was officially introduced in 1954 by A. W. Philips in the engineering field. In the financial sector, the theory of automatic stabilizer was introduced by Richard Musgrave in 1959 as a flexible formula. In the 1970s, empirical tests of the automatic stabilizer theory was carried out mainly by using econometric models. In 1978 Lucas and Sargent tested the automatic stabilizer policy in Keynes' macro-econometric model. After that, many researchers tried to test the effectiveness of the automatic stabilizer policy in several countries, especially in developed countries.

Fatas and Mihov (2003) examined the effect of automatic stabilizer on business cycle fluctuations and found it to have a negative relationship with fluctuations in the business cycle. They showed that the magnitude of the automatic stabilizer's effect on fluctuations in the business cycle is influenced by the size of the government budget. The larger the government size, the stronger the effect of the automatic stabilizer on business cycle fluctuations.

Bella's (2002) study confirmed the findings of Fatas and Mihov (2003). Bella (2002) found that the fiscal stabilizer effectively influences business cycle fluctuations. However, its effectiveness is influenced by several variables, such as the size of the government budget, the responsibility of taxes and transfers to the economic cycle, the level of economic openness, and the proportion of household and company spending. Bella (2002) also finds that the fiscal stabilizer is more effective through tax and transfer instruments. This fiscal stabilizer policy can reduce business cycle fluctuations between 35-45 percent. Unfortunately, the regulation regarding the balanced budget increases the fluctuation of economic output and reduces the potential output.

Silgoner *et al.* (2003) strengthened the findings of Bella (2002) by showing that that government expenditure affects the effectiveness of the automatic stabilizer. However, Silgoner *et al.* (2003) found that the effect of the automatic stabilizer on business cycle fluctuations only occurs in the short term, and in the long term, the effect of the automatic stabilizer is reduced.

Colciago *et al.* (2008) focused on the Monetary Union countries and found that the automatic stabilizer affects macroeconomic stability through disposable income. They observed that when income decreases, consumption and economic performance also decrease.

However, empirical research on the impact of fiscal policy on macroeconomic stabilization is still inconclusive. This inconclusiveness results from differences in the economic structures of countries. In developing countries, the governments tend to be more dominant because the national economies are controlled by government-owned companies. In addition, in some developing countries, the governments have great powers so that they are able to make various policies according to their wishes, meaning that the discretionary policy is preferred to the automatic stabilizer policy in such countries (Horton and El-Ganainy, 2012). Apart from the economic structures, the fiscal space also influences the automatic stabilizer policy. Countries with large fiscal spaces tend to combine automatic stabilizer policies with discretionary policies to cover various weaknesses in the automatic stabilizer policy (Boone and Buti, 2019).

Research on the cyclicity of government fiscal policy in Indonesia has been conducted by some researchers, such as Akitoby *et al.* (2006) and Baldacci (2009). However, their research did not find any contradictions in fiscal policy in Indonesia. Fiscal policy in Indonesia tends to be more acyclical or even procyclical. The phenomenon of the acyclicity of fiscal policy in Indonesia raises the suspicion of the role of the automatic stabilizer, while the procyclicality of fiscal policy further leads to allegations regarding the role of discretion. Surjaningsih *et al.* (2012), for instance, found that taxes have an influence on the Indonesian economy in both the short and long term. This finding can be an early indication that the tax variable can be used as an instrument of automatic stabilizer policy in Indonesia (Surjaningsih *et al.*, 2012).

However, as far as we know, there are not many studies that specifically examine the automatic stabilizer in the Indonesian state financial budgeting system, especially regarding the effectiveness of the automatic stabilizer policy in dealing with the economic crisis both statistically and economically, as well as government administration about making binding regulations. This study tries to address this research gap.

III. METHODOLOGY

This study uses a mix approach, representing both quantitative and qualitative approaches. A quantitative approach is used to calculate how much influence the components of the automatic stabilizer policy have in returning economic growth to its optimal point during an economic recession. Meanwhile, a qualitative approach is used to examine the possibility of implementing an automatic stabilizer policy in the practical implementation phase of state finances.

A. Quantitative Approach

In this empirical study, revenue is defined as $Rev \in \{IT, VAT, Others\}$ and expenditure as $Exp \in \{Cexp, Rexp\}$. The variable IT is income tax, VAT is value added tax, and $Others$ is other revenue. Similarly, the variable $Cexp$ is central government expenditure and $Rexp$ is transfer to local government.

Government revenues are categorized into two: tax and non-tax excluding grant receipts. The government spending terms used in this study are the central government spending or the realization of recurring expenditures (mostly allocated for wages/salaries and purchases of goods/services) and capital expenditures and interest payments (IRP). This study also assesses transfer spending to the regions. Ideally, social assistance spending is also covered; however, the series of this data is not available. For this reason, the automatic stabilizer is examined for two government expenditures, namely central government spending and spending on the regions.

The sample period is from the first quarter of 1983 to the first quarter of 2022. Fiscal data is obtained from the Ministry of Finance, while GDP data is obtained from the Statistics Indonesia. All nominal variables are converted to real values through the GDP deflator. The GDP deflator is the quotient between GDP at current prices and GDP at constant prices. The constant prices have been adjusted for the same base year (2010=1).

A.1. Model Estimation

The purpose of this section is to develop an analytical framework in which this purpose can be clearly stated as a set of formal propositions. The notion of a government budget constraint proposes that total government expenditure (Exp) should be sufficiently financed by total domestic revenue (Rev). If Rev is not enough to cover Exp , the available financing option is debt, resulting in interest payment (IRP) in subsequent periods. The overall fiscal balance (i.e. deficit or surplus) is the difference between Rev and Exp :

$$OB = Rev - Exp \quad (1)$$

When IRP is excluded from total government spending, the main fiscal balance (PB) is obtained:

$$PB = Rev - (Exp - IRP) \quad (2a)$$

and then

$$OB = PB - IRP \quad (2b)$$

Thus, simply looking at changes in the fiscal balance can be misleading: these changes can give the impression of expansionary (or contractionary) discretionary policy action, even if the changes are driven by cyclical factors. This is why cyclical adjustments are applied, to screen for the impact of cyclical movements on fiscal variables and assess the "underlying" fiscal stance.

Based on the above analytical framework, the following models are estimated to address the research questions.

$$\log(Y^P) = a + b \log(\text{Rev}/Y) \quad (3a)$$

$$\log(Y^P) = a + b \log(\text{Exp}/Y) \quad (3b)$$

where Y^P is potential output and Y is the actual output. We estimate these models using the AutoRegressive Distributed Lag (ARDL) method. The ARDL approach to cointegration, developed by Pesaran and Shin (1999), has advantages over the traditional cointegration techniques because it can be applied even with a mixture of $I(0)$ and $I(1)$. The ARDL approach to cointegration consists of two steps. The first step is to check for the existence of a long-run cointegration relationship among variables. If cointegration is established, the second step is to estimate the long- and short-run coefficients using Error Correction Models (ECM). If the cointegration is rejected, the second step converges to the estimation of short-run coefficients only.

A.II. Discretion and Automatic Stabilizer Calculation

Following the OECD methodology (Giorno *et al.*, 1995), primary fiscal balances can be broken down into Cyclically Adjusted Primary Balance (CAPB) and Cyclically Primary Balance (CPB):

$$PB = CAPB + CPB \quad (4)$$

The variable CPB is part of the main balance that automatically reacts to the cycle. Interest payments are often kept separate because their movements, although "automatic" in the sense that they do not generally reflect discretionary fiscal policy action, may not necessarily correlate with changes in cyclical output.

From (2b) and (4), changes in OB can be described as: (i) the automatic response of fiscal variables to changes in output; (ii) the response of fiscal variables to changes in discretionary policies; and (iii) changes in interest payments, as follows:

$$\Delta OB = \Delta CAPB + \Delta CPB - \Delta IRP \quad (5)$$

where Δ is the difference between two consecutive years, t and $t+1$ (or the difference relative to the reference year).

Finally, the Automatic Stabilizer (AS) is defined as a change in the primary balance of the cycle:

$$AS = \Delta CPB = \Delta OB - \Delta CAPB + \Delta IRP \quad (6)$$

Changes in the cyclically adjusted primary balance can come from cyclically adjusted income and expenses. Specifically, the cyclically adjusted revenue component Rev^{CA} is defined as:

$$Rev^{CA} = R \left(\frac{Y^P}{Y} \right)^{\varepsilon_R} \tag{7}$$

where Y^P is potential output (that is, the maximum compatible output, at any given time, in the absence of unexpected inflation), Y is the actual output and ε_R is the income elasticity with respect to the output gap.

Similarly, the cyclically adjusted expense component Exp^{CA} is expressed as:

$$Exp^{CA} = E \left(\frac{Y^P}{Y} \right)^{\varepsilon_E} \tag{8}$$

where ε_E is the elasticity of spending with respect to the output gap:

$$gap = \left(\frac{Y - Y^P}{Y^P} \right) \tag{9}$$

By subtracting (8) from (7), we get a cyclically adjusted primary balance:

$$CAPB = R \left(\frac{Y^P}{Y} \right)^{\varepsilon_R} - E \left(\frac{Y^P}{Y} \right)^{\varepsilon_E} \tag{10}$$

Cyclically adjusted primary balances are often measured in terms of potential output of a “natural” scale variable because cyclically adjusted balance measure what the fiscal balance would look like if output were at its potential level ($Y=Y^P$).

$$capb = \frac{Rev^{CA}}{Y^P} - \frac{Exp^{CA}}{Y^P} = \frac{Rev}{Y} \left(\frac{Y^P}{Y} \right)^{\varepsilon_R - 1} - \frac{Exp}{Y} \left(\frac{Y^P}{Y} \right)^{\varepsilon_E - 1} \tag{11a}$$

where gap is the output gap, while r and e indicate, respectively, the ratio of income and expenditure to GDP. The $capb$ shows the ratio of the cyclically adjusted primary balance to potential GDP.

$$capb = r(1 + gap)^{-(\varepsilon_R - 1)} - e(1 + gap)^{-(\varepsilon_E - 1)} \tag{11b}$$

This expression captures the primary “structural” balance; that is, the primary balance unaffected by cyclical fluctuations. Changes in $capb$ are often used to estimate the size/cost of discretionary policies..

$$cpb = \frac{CPB}{Y} = \frac{PB}{Y} - \frac{CAPB}{Y^P} = pb - capb \tag{12a}$$

$$cpb = r(\varepsilon_R - 1)gap - e(\varepsilon_E - 1)gap \tag{12b}$$

where pb and cpb are, respectively, primary balances and cyclical primary balances in percent of actual GDP. The contribution of the automatic stabilizer to the change in overall balance is then given by the change (12b) between the two periods.

$$as = \frac{\Delta S}{Y} = \Delta cpb = cpb_t - cpb_{t-1} \quad (13)$$

To identify potential outcomes, the Hodrick-Prescott (HP) filter was adopted. This filter is widely used among macroeconomists to obtain smooth estimates of the components of the long-term trend of a series. This method was first used by Hodrick and Prescott (1997) to analyze the postwar US business cycles.

Technically, an HP filter is a two-sided linear filter that computes a smooth series τ of y by minimizing the variance of y around τ , subject to a penalty that limits the second difference to a second. That is, the HP filter chooses to minimize:

$$\sum_1^T (y_t - \tau_t)^2 + \lambda \sum_2^{T-1} [(\tau_{t+1} - \tau_t) - (\tau_t - \tau_{t-1})]^2 \quad (14)$$

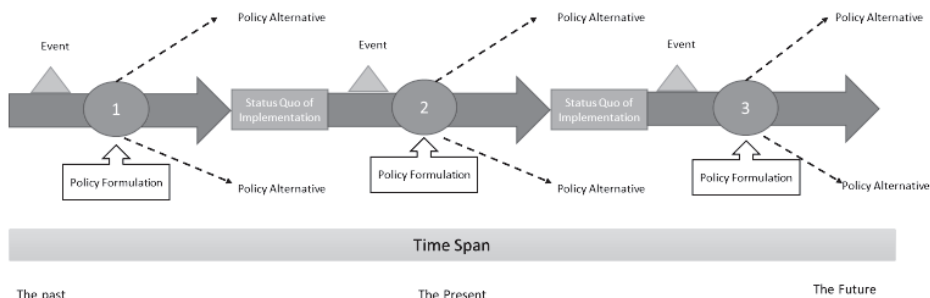
The penalty parameter λ controls the smoothness of the series τ . The larger λ , the smoother τ . When $\lambda = \infty$, τ approaches a linear trend. The default value of λ is set to 1,600 for quarterly data.

B. Qualitative Approach

The qualitative approach used in this research is the process-tracing method. The process-tracing method allows the policymaker to discover historical causal mechanisms. This method finds causal mechanisms between conditions and their resulting outcomes through analysis of a series of events in one or several cases (Putra and Sanusi, 2019). The process-tracing operation can be seen in Figure 2.

Qualitative data were collected through interview and documentation techniques. Interviews were conducted with several informants. In selecting informants, the criteria used were the representation of the elements of the institution, and the actors involved in making the regime of state financial management, both in the new order era and also in the reform era. In the two institutions studied, there were at least four informants and this number will continue to increase until the data/information obtained has been saturated. The selection of informants was carried out using a purposive sampling technique, namely a sampling technique for data sources with certain considerations (Sugiyono, 2016).

Figure 2.
Operationalization of the Process-tracing Method in Public Policy Analysis
This figure shows the operationalization of the process-tracing method in public policy analysis. This is sourced from Putra and Sanusi (2019).



Informants selected in order to answer the formulation of this research problem include:

1. Head of the Fiscal Policy Agency, Ministry of Finance of the Republic of Indonesia for the Period 2006-2010;
2. Deputy of Budget Committee, the House of Representative of the Republic of Indonesia, for the 2004-2009 Period;
3. Vice Minister of Finance of the Republic of Indonesia for the 2019-2024 Period;
4. Chairman of the Budget Committee, the House of Representative of the Republic of Indonesia, for the 2019-2024 Period.

To check the validity of the data, we used two approaches, which are:

1. **Triangulation**, which is a technique of checking the validity of data that utilizes something other than the data for checking purposes or as a comparison against the data (Lexy, 2018).
2. **Persistence Observation**, intends to find characteristics and elements in a situation that are very relevant to the problem or issue being sought and then focus on those things in detail.

Procedures and analytical techniques of this process-tracing method are carried out in the following steps:

1. To conceptualize the causal relationship;
2. Conduct case selection;
3. Gather valid evidence or evaluate empirical evidence;
4. Hypothesis testing on the operationalization of empirical tests. This step is carried out deductively to test research hypotheses with conclusions, both those from qualitative and quantitative methods.

IV. EMPIRICAL FINDINGS

A. Quantitative Evidence

Table 1 presents descriptive statistics of all fiscal variables that were studied during the study period. All values variables have been seasonally adjusted and at constant prices. The ratio of state revenue to GDP over the sample period was 15 percent, whereby tax revenue contributed to 64 percent of total revenue. Income

and value added taxes contributed 30 percent and 21 percent, respectively, to total revenue. Meanwhile, the contribution of consumption tax to total revenue reached 28 percent. Apart from that, the portion of other tax revenue and non-tax revenue reached 36 percent consisting of foreign tax revenue, customs, and excise. Looking at the composition above, the structure of state revenue is not ideal, which in turn will affect the automatic stabilizer instrument.

Over the same time period, the ratio of total spending to GDP stood at 17 percent. Of this amount, central government spending has contributed to total spending on average reaching 74 percent. Meanwhile, transfers to the regions have an average contribution of 26 percent to total expenditure. Expenditures to the regions are a type of obligatory expenditures in accordance with the mandate of the Law, which stipulates that 26 percent of the total revenue must be allocated to the regions. Interest payments contributed to 10 percent of total spending, while the growth in central government spending excluding interest payments on debt and capital expenditures contributed 53 percent and 21 percent, respectively.

Table 1.
Descriptive Statistics of Fiscal Variables

This table reports the descriptive statistics of the fiscal variables. The statistics are observations (Obs.), mean (Mean), standard deviation (Std. Dev.), minimum (Min.), and maximum (Max.). VAT denotes value added tax.

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
Total Revenue	157	0.153	0.020	0.107	0.221
Tax Revenue	157	0.642	0.143	0.235	0.834
Income Tax	157	0.297	0.089	0.099	0.435
VAT	157	0.214	0.057	0.044	0.289
Excise	157	0.064	0.018	0.040	0.115
Consumption Tax	157	0.278	0.069	0.084	0.392
Non-tax Revenue	157	0.356	0.144	0.158	0.765
Total Expenditure	157	0.165	0.016	0.124	0.204
Central Government Expenditure	157	0.739	0.072	0.618	0.881
Current Expenditure	157	0.530	0.089	0.336	0.727
Interest Payment	157	0.098	0.051	0.043	0.263
Capital Expenditure	157	0.208	0.134	0.065	0.443
Transfers to Local Government	157	0.261	0.072	0.119	0.382

Next, following Sen and Kaya (2013), the Granger causality test is used to detect the causal role of the automatic stabilizer. Table 2 reports the results of the standard Granger causality test for total state revenues, tax revenues, income taxes, VAT, and consumption taxes. Since tax revenue is collected based on taxpayers' activities in the previous period, we use economic growth at period $t-1$ to analyze its interaction with tax revenues in period t . With a degree of freedom (df) of 2 (i.e. $df=2$), the results of the Granger causality test show that there is a one- and two-way causality. The values in the $Prob > Chi2$ column are a reference to reject the null hypothesis (H_0) or not. In the Granger causality test, H_0 implies a variable in the

Excluded column does not affect the variables in the *Equation* column. The results in Table 2 suggest that: (1) growth in income tax revenue (*D_linctax*) and previous GDP growth (*LD_lry*) have a two-way causality (or they influence each other); (2) GDP growth affects total revenue growth (*D.ltr*) but not vice versa; and (3) tax revenue growth (*D.ltax*), VAT growth (*D.lvat*), excise tax growth (*D.lcuk*), and consumption tax growth (*D.lconstax*) affect GDP growth but not vice versa. The income tax revenue and GDP have a two-way relationship, which means income tax revenue has the potential to become an automatic stabilizer.

The Granger causality test is also applied to the spending side with GDP. Table 3 shows that growth in total spending (*D.ltexp*), growth in central government spending (*D.lcgexp*), growth in central government spending excluding interest payments on debt (*D.lcurexp*), and growth in capital spending (*D.lcapex*) affect GDP growth but not vice versa. Meanwhile, interest payments and transfers to regions with GDP growth do not affect each other. Similar to the details of the components of revenue, in general, the expenditure components only have a one-way relationship. That is, these variables are used more as discretion rather than automatic stabilizer.

Table 2.
Causal Relationship between Revenue and GDP

Equation	Excluded	Chi2	df	Prob > Chi2
LD.lry	D.ltr	3.4516	2	0.178
D_ltr	LD.lry	5.3795	2	0.068
LD_lry	D.ltax	14.271	2	0.001
D_ltax	LD.lry	3.1724	2	0.205
LD_lry	D.linctax	7.7574	2	0.021
D_linctax	LD.lry	5.4865	2	0.064
LD_lry	D.lvat	5.3978	2	0.067
D_lvat	LD.lry	1.4967	2	0.473
LD_lry	D.lcuk	11.211	2	0.004
D_lcuk	LD.lry	3.2135	2	0.201
LD_lry	D.lconstax	9.7084	2	0.008
D_lconstax	LD.lry	2.2231	2	0.329
LD_lry	D.lntax	4.5099	2	0.105
D_lntax	LD.lry	1.4364	2	0.488

Table 3.
Causal Relationship between Expenditure and GDP

Equation	Excluded	Chi2	df	Prob > Chi2
D_lry	D.ltexp	8.101	2	0.017
D_ltexp	D.lry	1.098	2	0.577
D_lry	D.lcgexp	9.894	2	0.007
D_lcgexp	D.lry	0.116	2	0.944
D_lry	D.lcurexp	9.501	2	0.009
D_lcurexp	D.lry	0.179	2	0.914
D_lry	D.lintpay	0.858	2	0.651
D_lintpay	D.lry	3.054	2	0.217
D_lry	D.lcapex	5.211	2	0.074
D_lcapex	D.lry	0.546	2	0.761
D_lry	D.ltkd	1.588	2	0.452
D_ltkd	D.lry	2.693	2	0.260

We calculated the elasticities of the fiscal variables ε_R and ε_E in Equations (7) and (8) against the output gap and presented the results in Table 4. Since the level of stationarity among variables is different, we use the ARDL model to obtain the elasticity numbers. The numbers show us that total revenue and total expenditure are slightly inelastic. Some components of tax revenue have ε_R greater than one, which make them more elastic. On the other hand, on the expenditure side, all the government expenditure components except *Transfer to Local Government* are inelastic.

The greater the level of elasticity indicates that the influence of these variables is getting bigger. Table 4 shows that several variables have an elasticity of more than 1.0, so we can conclude that these variables are elastic and influence fluctuations in the business cycle. These elastic instruments can be used as an automatic stabilizer.

Table 4.
The Income Elasticity of Revenue and Expenditure

Revenue	ε_R	Expenditure	ε_E
Total Revenue	1.1543***	Total Expenditure	0.03775
Tax Revenue	0.8649***	Central Government Expenditure	0.0809
Income Tax	1.0676***	Current Expenditure	0.1663
VAT	0.9615***	Interest Payment	1.7598
Excise	1.9333***	Capital Expenditure	0.0110
Consumption Tax	1.0213***	Transfer to Local Government	0.8889**
Non-tax revenue	1.2973**		

Based on the elasticity values, we also find that the variables from the revenue side have higher elasticity values than those from the expenditure side. The high values of the elasticity of the variables from the revenue side show that the automatic stabilizer will be more effective if based on the variables from the revenue side. Our findings are consistent with the research of Sen and Kaya and Kaya (2013), who also found that tax variables affect GDP fluctuations in developing countries.

The results from the estimation of Equation (9) for real GDP are shown in Figure 3. The output gap tends to be low in the mid-1980s, 1998 crisis, and during the pandemic period. In the mid-1980s, the national economy of Indonesia was hit by a recession and trade protections in major export destination countries. In contrast, the output gap narrowed as the economy grew impressively, especially in the late 1980s and early 1990s. The output gap turned to negative during the Asian Financial Crisis, and stabilized in 2000s. The gap became positive right before COVID-19 pandemic hit in 2020 and dragged the output gap into negative. This result gives the initial indication that the output gap plus/minus 5 percent (normal estimate) and 10 percent (pessimistic estimate) can be used as an initial reference for active fiscal policy, either through discretion or automatic stabilizer.

Figure 3.
Output Gap $((Y-Y_p)/Y_p)$

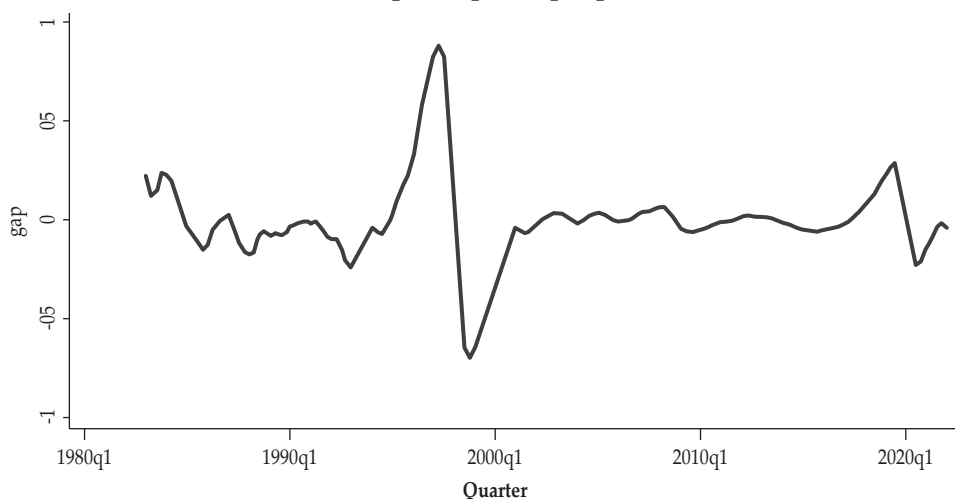


Figure 4 shows the evolution of the output gap. It provides better information about the automatic stabilizer and fiscal discretion. The Equations (11b) and (12b) show that the downward movement of the fiscal discretion and automatic stabilizer comes from a decrease in the revenue components or an increase in the expenditure components, and vice versa. The role of systemic fiscal discretion appeared to be high in the mid-1980s and during pandemic. The same pattern is found in the automatic stabilizer. The automatic stabilizer looked very high in the early-1980s, the 1997/1998 crisis, and during the pandemic. Financial sector regulations launched in June 1983 and the enactment of the new Taxation Law in 1985 are thought to have triggered the high role of automatic stabilizers. After that, the role of the automatic stabilizer became relatively stable. However, the automatic stabilizer through government expenditure was very high in Asian Financial Crisis. In pandemic, both discretionary and automatic stabilizer policies were used in the same direction. In the early phase of the pandemic, the government injected a large stimulus package into the economy by using discretion. The

automatic stabilizer and fiscal discretion was reduced in the following years of pandemic. Overall, even though the government uses discretion more, we see that the government uses both automatic stabilizers and systemic fiscal discretion to manage macroeconomic performance through the state budget deficit.

Figure 4.
Discretion and Automatic Stabilizer

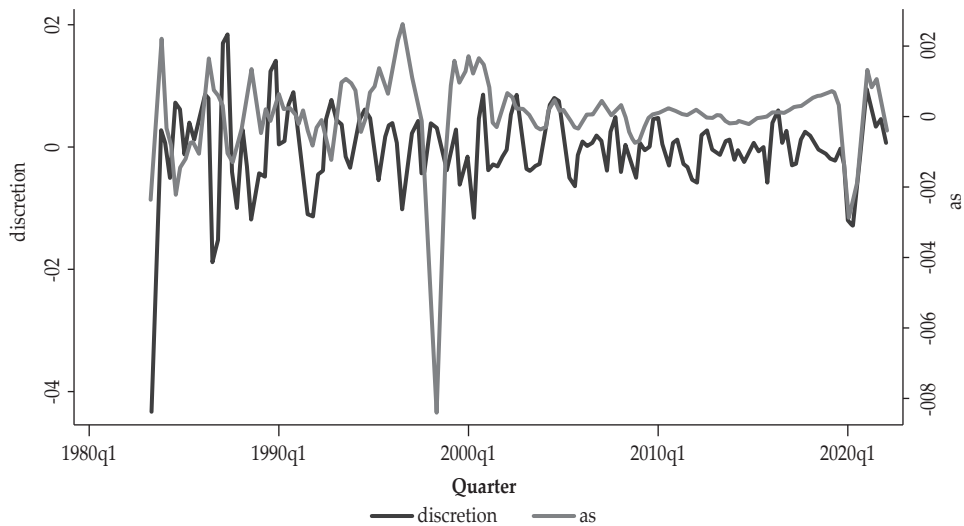


Table 5 compares the effectiveness of the automatic stabilizer policy to fiscal discretion. The automatic stabilizer has a positive correlation with fiscal discretion, primary balance, overall deficit, and output gap. This is in accordance with the theoretical prediction that the automatic stabilizer will increase the budget deficit. However, the automatic stabilizer component can be raised if the potential output is below than the actual output.

The fiscal discretion has an association in the same direction with the primary balance deficit and the overall deficit. However, fiscal discretion moves in the opposite direction to the output gap. An increase in fiscal discretion is always associated with a reduced gap between potential output and actual output. Consequently, discretionary fiscal policy becomes countercyclical. The relatively low stabilization component in fiscal policy is suspected to have caused the stimulus policy to be large and expensive (Dolls *et al.*, 2012).

**Table 5.
Correlation**

	AS	Discretion	RPB	RDef	Gap
AS	1.0000				
Discretion	0.0765	1.0000			
RPB	0.1538	0.1963	1.0000		
RDef	0.0796	0.1790	0.7996	1.0000	
Gap	0.1819	-0.0505	0.3402	0.3499	1.0000

A. Automatic Stabilizer Policy Adaptation in Public Policy Management during Economic Recession

When facing crises from both economic and non-economic shocks, a strong framework is needed to ensure that public financial management is still able to create a stable, growing, and equitable economy. With reliable public financial management, every crisis can be prevented and handled in an integrated, efficient, and effective manner.

During a recession, the policymaker needs to review the various instruments in the public financial management system to determine the most suitable instruments to deal with an economic recession. These instruments include information, policy processes, and rules (Schick, 2013). These three instruments must be developed and improved in order to remain relevant in facing the crisis.

Indonesia actually already has a crisis handling protocol as stipulated in the Law 9/2016 on Prevention and Handling of Financial System Crisis. With the crisis protocol in place, members of the Financial System Stability Committee consisting of the Minister of Finance, the Governor of Bank Indonesia, the Chairman of the Board of Commissioners of the Financial Services Authority (OJK), and the Chairman of the Board of Commissioners of the Indonesia Deposit Insurance Corporation (LPS) can exchange data and information needed to prevent and handle a financial system crisis.

Information in public financial management in Indonesia is sufficient, although still not perfect. With the support of the information system that is continuously being developed, information can be quickly obtained to serve as the basis for making fiscal policy. In times of crisis, whereby information becomes very important to be obtained quickly and in real time, the process of exchanging information can also be carried out between agencies. The crisis protocol in Law 9/2016 is the key to exchanging information and quick decision making in preventing potential crises and overcoming crises when they occur.

The next instrument of public policy management is the policy process. The policy process is the turning of information into decisions, actions, or documents. Each significant Public Finance Management (PFM) innovation changes one or more procedures, usually concurrently with changes in information (Schick, 2013). In the face of a recession, whereby the economy experiences a long decline, the fiscal policy can follow the discretionary policy procedures and/or automatic stabilization.

The main advantage of automatic stabilization is the automatism in its functioning because no government action is required to reduce output fluctuations

(Lukovic, 2014). Anggito Abimanyu (Head of Fiscal Policy Agency, Ministry of Finance of the Republic of Indonesia, in 2006-2010 period) (results of interview on February 16, 2022) explained that before 2008, Indonesia did not have a specific automatic stabilization mechanism that was strong and legally binding. The 2009 State Budget Law has tried to include the mechanism, which is in the form of triggers, indicators, impacts, and policy alternatives as well as quick decisions in the event of a crisis.

Similarly, Suahasil Nazara (Vice Minister of Finance, 2019-2024) (results of interview on January 26, 2022) explained that the essence of automatic stabilization is a fiscal strategy to mitigate risk and maintain economic stability as well as fiscal sustainability amid economic conditions that are still overshadowed by uncertainty. In general, automatic stabilization aims to: (1) maintain economic stability, (2) protect the poor and vulnerable, as well as the business from economic and social shocks, and (3) ensure that the implementation of the state budget is able to keep various priority programs running amidst conditions of uncertainty. The state budget during the pandemic and in the future has been designed to be more flexible in reducing fluctuations/challenges that have an impact on the fluctuations in budget needs. The quick response of the state budget in handling the pandemic and accelerating economic recovery has been designed as automatic stabilization policy. The state budget anticipates depressed economic conditions due to a pandemic/crisis, and the state budget automatically scales down when economic conditions recover/improve.

However, according to Said Abdullah (Chairman of the Budget Committee, the House of Representative of the Republic of Indonesia) (results of interview on March 15, 2022), Indonesia carried out automatic stabilization as well as discretionary fiscal policy in the 2020 recession—hence, no one policy solves many problems. A good public policy is one that includes many considerations, and is multidisciplinary. The choice does not contradict the policy of whether to use automatic stabilization or discretionary policy. What is needed is the accuracy of reading the problem, and placing the appropriate policy response.

If we refer to the empirical results and the views of policymakers, the automatic stabilization policy is effectively used in facing a recession. Information that can be obtained from the Central Statistics Agency of Indonesia and exchange of data and information through crisis protocols related to global and national economic indicators can be used as a reference. By considering information related to leading economic indicators of a crisis, the government of Indonesia through the Financial System Stability Committee can determine the condition of the economic crisis and activate the automatic stabilization fiscal policy. The activation of the automatic stabilization fiscal policy will create flexibility in fiscal instruments, such as taxes and spending to stabilize the economy near its optimal point. What needs to be considered is that if the impact of shocks on the economy is large enough, the fiscal deficit experienced by the state budget will also have the potential to expand. Thus, the implementation of the automatic stabilization fiscal policy requires a flexible deficit space to be able to stabilize the economy.

Regarding the most optimal fiscal instruments (tax incentives, spending, or financing) in the automatic stabilization policy during a crisis, Suahasil Nazara (results of interview on January 26, 2022) explained that the choice of

fiscal instruments to respond to uncertainty will be aligned with the needs and challenges being faced by the economy. Our empirical results show that the most effective fiscal policy instruments in dealing with successive crises are Other Tax Stimulus, Excise Stimulus, Value Added Tax Stimulus (VAT), Increased Central Government Expenditure, Income Tax Stimulus (PPH), Tax Stimulus Land and Buildings, and increased Transfers to Regions and Village Funds.

The third instrument of public financial management is the rules. The inherent lack of information and process-based innovation has prompted public financial management to devise rules that constrain political and managerial decision-makers and dictate substantive outcomes. Because reliable information and good procedures can, and often do, lead to substandard or undesirable results (Schick, 2013). According to the International Monetary Fund's Fiscal Rules Dataset (in Bandaogo, 2020), the fiscal policy rules applied by many countries include debt regulations, expenditure rules, income rules, and/or balanced budget rules. Beyond the numerical limits and targets set by this rule, certain features also vary across countries such as the scope of the rule (whether the rule relates to central, state, and local (general) governments or only to the central government), legal basis, existence of independent monitoring authority and/or formal enforcement mechanisms, escape clauses, and formal sanctions for violations.

V. CONCLUSIONS

This paper examined the effectiveness of the automatic fiscal policy in dealing with economic recession in Indonesia. We found the following. *First*, the income tax revenue and GDP have two-sided causality, which can be potentially used as an automatic stabilizer. However, the other revenue components only have a one-sided relationship with GDP. On the other hand, in general, expenditure variables also have one-sided causality with GDP. Based on these results, we conclude that components of revenue and expenditure are used more as a fiscal discretion policy rather than as an automatic stabilizer.

Second, the government uses both automatic stabilizers and systemic fiscal discretion policies but uses fiscal discretion policies more to manage macroeconomic performance through the state budget deficit. During the pandemic, the automatic stabilizers and discretionary fiscal policies moved in opposite directions.

Third, the correlation results indicate that the automatic stabilizer has a positive association with the output gap, which means that it can be used when the potential output is greater than the actual output. In contrast, the discretionary fiscal policy has a negative association with the output gap, allowing the fiscal policy to be countercyclical.

Fourth, based on Indonesia's experience in facing crises, the country requires adaptation of public financial management by making a set of rules governing the implementation of discretionary policies or automatic stabilizers. The regulation must determine when the automatic stabilization policy is active and when the discretionary policy is active. This level of regulation should be further discussed, whether it will be made in the form of the State Finance Law or the National Budget Law.

Finally, the rules to regulate the application of discretionary policies and the automatic stabilizer must include articles that discuss escape clauses in the event of extraordinary conditions. In the case of Indonesia, the appropriate escape clause is to provide exceptions to the application of fiscal rules regarding the fiscal deficit limit of 3 percent with criteria and using specific indicators that are considered a crisis condition. Therefore, the fiscal discipline, which is the goal of the existence of fiscal rules, can be achieved, and when a major shock occurs in the economy, the application of automatic stabilization, which results in a widening of the fiscal deficit, can be accommodated by the existence of an escape clause by disabling fiscal rules regarding limits to the fiscal deficit, and thus ensuring that the fiscal response to a major crisis can be quickly carried out.

These findings have significant policy implications and open an additional avenue for understanding the effectiveness of policy stimulus to combat the COVID-19 pandemic. In order to accommodate the escape clause for the application of automatic stabilization in the face of a crisis with a large shock to the economy, the government needs to amend Law 17/2003 and include an escape clause with certain criteria, such as large deviations from the projected economic growth, and others. The government adopted a countercyclical policy intervention through fiscal stimulus with a focus on health, social protection, and support for the business world integrated in the national economic recovery program. This policy aims to encourage aggregate demand and economic activity that absorbs labor to improve economic conditions.

This study only examined fiscal policies, both discretionary and automatic stabilization policies during crises. Hence, the effectiveness of the policies was only considered for crises periods. We, therefore, recommend further research to analyze and compare the implementation of fiscal discretionary and automatic stabilization policies in normal times. By doing this, we will obtain a better fiscal policy model that can be implemented during periods of economic expansions (booms) and economic contractions (busts).

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