

## THE IMPACT OF NON-SYSTEMATIC DISCRETIONARY FISCAL POLICY ON INCOME DISTRIBUTION: A CROSS COUNTRY ANALYSIS

<sup>1</sup>Tariq Aziz, <sup>2</sup>Sher Ali,

### ABSTRACT

**Keywords:**

*Non-systematic*

*Income-Distribution,*

*Fiscal-Discretionary*

*Policy, GMM*

The rising income inequality is a global problem, and reducing income inequality is one of the Sustainable Development Goals of the United Nations. This paper examines the impact of non-systematic fiscal discretionary spending on income distribution in selected developed and developing countries. The paper's panel is comprised of 64 countries from 1980 to 2021. World Income Inequality Database (WIID) is utilized for income inequality data; moreover, the leftover variables are extracted from World Development Indicators (WDI). This study employed the Generalized Method of Moment (GMM) in a two-step Forward Orthogonal Deviation (FOD) transformation to obtain the results. In aggregate analysis, the study's results confirm the significant role of non-systematic fiscal discretionary spending in income distribution, revealing that income inequality is reduced with non-systematic discretionary public expenditures. In disaggregate analysis, the results of developing countries also found supportive evidence for the impact of non-systematic fiscal discretionary spending on income distribution, and it is concluded that income inequality significantly diminishes with the extension of non-systematic discretionary fiscal spending. In contrast, the developed countries' results indicated that the non-systematic fiscal discretionary spending plays no role in income distribution and found that the income inequality of developed countries isn't affected by discretionary public expenditures.

### INTRODUCTION

The role of fiscal policy in macroeconomic conditions is always interesting; over the last several decades, policymakers and researchers have given it a prominent place in their policymaking and research. The importance of fiscal policy was realized after the Great

<sup>1</sup> PhD Scholar, Islamia College University Peshawar, Pakistan. Email: [tariq.qau077@gmail.com](mailto:tariq.qau077@gmail.com)

<sup>2</sup> Associate Professor, Islamia College University Peshawar, Pakistan. Email: [drali@icp.edu.pk](mailto:drali@icp.edu.pk)  
(Corresponding Author)

Recession, which led to a debate recording the true influence of fiscal policy on economic stability and the business cycle (Agnello & Sousa, 2011; Ali & Khan, 2020; Brunila *et al.*, 2003; Flores & Berdanaz, 2022). Fiscal policy measures, including government spending and taxation, are the two primary measures by which the government seeks to achieve the goals of a sustainable economic growth rate and create supportable social outcomes (Bogolib, 2015)<sup>3</sup>. Different schools of thought in macroeconomics have different opinions on the influence of fiscal policy, with two prominent schools of thought, Classical and Keynesian, having opposing opinions on the role of fiscal policy (Palley, 2013). The early classical school of thought contends that government fiscal measures lead to inefficiency, greater distortions in the macroeconomic system, discrimination between sectors, and lower productivity (Barwell, 2017; Munir & Riaz, 2019). In contrast, Kenyans believe that discretionary fiscal measures taken by public authorities play an important role in triggering economic growth. These measures create investment opportunities that cause economic stability, eliminate short-run fluctuations in the business cycle, produce the desired amount of public goods, and drive the economy at a steady pace (Middleton, 2013). Undeniably, these wide differences exist because no separate channel or mechanism can confirm the direct impact of fiscal instruments<sup>4</sup> on macroeconomic variables (Gupta *et al.*, 2005).

The role of fiscal policy in achieving the macroeconomic objective arose as a response to the Great Depression of the 1930s and rising to the idea of economist John Maynard Keynes (Parkin, 2008). However, in the mid of 1970s, the budgetary policy becomes unpopular with the collapse of the Keynesian view, and the role of budgetary policy in economic stabilization become questionable with the Ricardian Equivalence theory (Barro, 1974). But the Recession of 2008-09 reaffirmed the importance of fiscal stimulus and brought back the ideas of Keynesian macroeconomics (Parkin, 2008). The use of fiscal policy has always been popular among researchers and policymakers during and after crises and has gained considerable importance. At the same time, an additional debate has arisen since the Great Recession about the real effect of fiscal policy components on other economic and social indicators. An aspect of the literature documented studies that fiscal spending show has a direct impact not only on economic stability (Epstein & Gintis, 1995; Kelly, 1997) but also on other macroeconomic indicators such as income distribution (M. V. Tanzi, 1998; V. Tanzi, 1974). Another aspect of

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<sup>3</sup>(Lustig, 2017) discusses the sustainable social outcomes of fiscal policy, including reductions in poverty rates, income inequality and unemployment rates.

<sup>4</sup> Government spending and taxes are the primary instruments of fiscal policy.

the literature conducted the study and provides evidence that fiscal spending slowdown not only economic growth (Barro, 1991; Engen & Skinner, 1992; Grier & Tullock, 1989; Lee, 1995) but also income distribution (Chu *et al.*, 2000).

As time went on, the researcher put the spotlight on fiscal stimulus. (Fatás & Mihov, 2003; Galí & Perotti, 2003) decomposed the fiscal policy into two stimuli; automatic and discretionary fiscal policy. The first component of the fiscal policy is the automatic stabilizers, and is automatically adjusted with economic conditions<sup>5</sup>. The discretionary stimuli of the fiscal are further divided into systematic and non-systematic discretions. The first one is systematic discretion, also called the structural or cyclical adjusted fiscal policy, mainly related to macroeconomic objectives<sup>6</sup> and endogenously determined (Fatás & Mihov, 2003; Galí & Perotti, 2003). The latter part is the non-systematic or exogenous component of the fiscal policy, which is implanted not for achieving the macroeconomic economic objectives; rather, it is the exogenous measures of fiscal policy and mainly practices for political purposes or others purposes (Ali & Khan, 2020; Flores & Berdanaz, 2022). Among these macroeconomic findings, the effects of fiscal discretion, particularly the effects of non-systematic fiscal discretionary spending on income inequality, are of great importance because income inequality has been rising since the emergence of capitalism.

In the present era, income inequality is a major challenge of the world, and the United Nations included it in Sustainable Development Goals (SDGs). Both in advanced and developing countries, the growing income inequality is a major task (Dabla-Norris *et al.*, 2015). Increased risks of social discontent and political unrest are consequences of income inequality (Barro, 2000). Similarly (Alesina & Perotti, 1996) argues that widening income inequality has increased the likelihood of uprisings, mass violence, revolutions, policy uncertainty, and threats to property rights; as a result, investment is adversely affected and slows down the growth rate. There is an increasing risk of income inequality worldwide in advanced and developing economies (Roser & Cuaresma, 2016). The world income inequality map obtained from World Income Inequality Database (WIID) for 1960 to 2021 indicated that African countries have more income inequality worldwide, followed by South America. As the increasing risk of income inequality has greater consequences, researchers and policymakers have given a

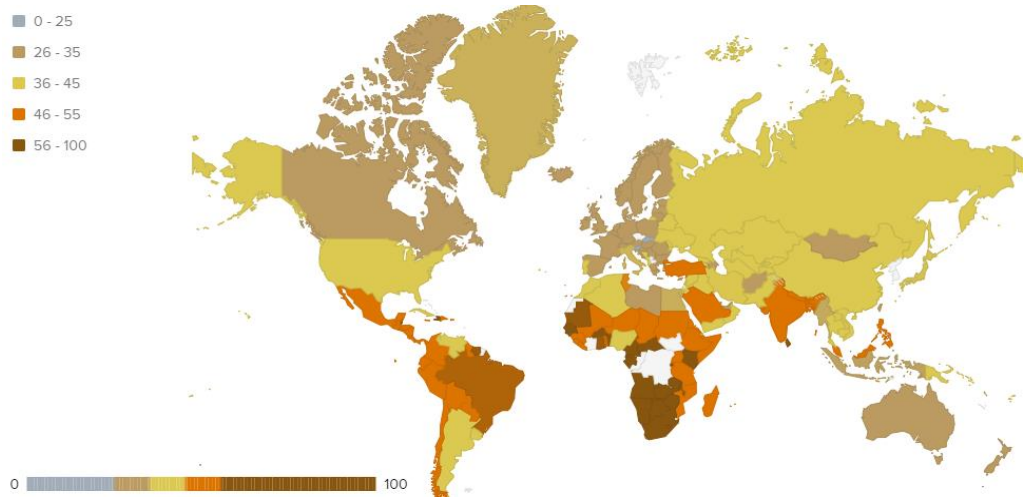
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<sup>5</sup> When there is a recession, government spending increases and its revenue decreases and the opposite of this when there is an inflationary gap (Parkin, 2008).

<sup>6</sup> Macroeconomic conditions or macroeconomic objectives are mainly considered as steady growth rate, price stability and full employment (Parkin, 2008).

prominent place to income inequality in their work. Most researchers try to understand the impact of macroeconomic indicators on income inequality. Among them, questions about the impact of fiscal spending and income inequality are very interesting and attract most researchers.

### **World Income Inequality Map**



Source: World Income Inequality Database (WIID)

There are two aspects of the literature; one examines the impact of total fiscal spending on income inequality, and there are enriching studies. The other side divided the fiscal policy into fiscal stimulus, which may be either automatic or discretionary, and tried to find out the influence of fiscal policy on income distribution; however, very little literature exists on this aspect. While examining the literature, we find a study (Flores & Berdanaz, 2022) investigating the impact of discretionary fiscal measures on income distribution in European Union countries using the annual data from 1990 to 2017. The results of the Panel Auto Regressive Distributive Lagged (ARDL) Model suggest that discretionary fiscal spending has a redistribution impact and reduces income inequality in the short run. Moreover, the results also indicated that income inequality rises with non-systematic discretions in the long run. The remaining literature examines the impact of all components of fiscal policy on income inequality. While searching the literature (Coady & Gupta, 2012) examined the role of fiscal policy in the income distribution of developed and developing countries using data sets for the years 1980-2010; the study submits that income inequality declines with the use of fiscal policy in developed economies. However, in developing economies, the influence of the budgetary policy on income distribution is conditional to health and educational expenditures. Another recent study (Sidek, 2021) re-examined the impact of fiscal spending on income inequality using the data for 122 countries, 91 developing and 31 developed. The study's major finding revealed that

government expenditures decrease income inequality; in advanced countries, the finding supports the Kuznet curve; moreover, in developing countries, conditional fiscal spending subject to health and education reduces income inequality. Another study (Anderson *et al.*, 2017) investigates the effect of fiscal spending on poverty and income inequality; the result shows that increasing fiscal spending reduces income inequality in middle-income countries. Differently, there is the fewest amount of literature that examines the role of fiscal policy in income distribution during fiscal consolidation phases<sup>7</sup>. Following the literature (Agnello & Sousa, 2014) find out the impact of fiscal policy in the consolidation phases of eighteen industrialized countries from 1978 to 2009, and the results are consistent with that of (Mulas-Granados, 2005).

Furthermore, fiscal expansions and fiscal consolidation have uneven consequences on income inequality. But, theoretical and empirical literature in this manner is almost non-existent. The literature (Mulas-Granados, 2005) concluded that European income distribution was determined by fiscal consolidation involving spending cuts. Another study (Paulus *et al.*, 2017) compared the fiscal spending and tax burden. The results indicated that fiscal spending in the form of family support has a greater significant role in income distribution than tax reliefs. Likewise, for Asian economies, the theoretical and empirical literature is also evident in only a few studies examining fiscal changes' impact on income distributions. Recent studies (Padhan *et al.*, 2022) examine the role of tax rate and government spending in income inequality using annual data with the nonlinear Autoregressive Distributive Lag Model (ARDL). The results indicate that income equality rises with the increase in the tax rate; moreover, it is also concluded that fiscal spending reduces income inequality. Another study (Claus *et al.*, 2013) examines the impact of public spending and tax rate on income inequality in Asia. The results indicate that the progressive taxation system reduces income inequality; however, government expenditures are more effective in reducing income inequality than the progressive tax system. A recent study (Malla & Pathranarakul, 2022) examined the conditional role of the institutional capacity of fiscal policy in income distributions of advanced and developing countries from 2000 to 2019. The Generalized Method of Moment (GMM) results suggest that a progressive tax system for income abates income inequality only in developing countries. Furthermore, it is also revealed that conditional fiscal spending on health and education reduces the income

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<sup>7</sup> Phase of the fiscal policy where government aimed to reduce fiscal deficit and debt accumulation through spending reduction or revenue increase.

inequality of developing countries only. Discretionary fiscal spending has greater macroeconomic consequences, especially on a country's economic performance. Another recent study (Kunawotor *et al.*, 2022) examines the impact of fiscal and monetary measures on the income distribution of Africa using panel data from 1990 to 2017. The results indicated that fiscal measures are more effective in the income distribution than monetary measures.

To summarize the literature about the influence of budgetary policy on income distribution, it is argued that fiscal expenditures have a greater influence on the income distribution of advanced countries. However, in developing countries, conditional expenditures on the public good, especially on education and health, reduced income inequality (Anderson *et al.*, 2017; Balseven & Tugcu, 2017; Coady & Gupta, 2012; Lustig, 2017; Paulus *et al.*, 2017; Sidek, 2021). This result is also supported by the most recent literature (Kunawotor *et al.*, 2022; Malla & Pathranarakul, 2022; Padhan *et al.*, 2022). Moreover, on the fiscal consolidation side, the literature discussed that the consolidation phase of fiscal policy widens income inequality (Agnello & Sousa, 2014; Mulas-Granados, 2005). However, the literature broadly neglected the fiscal policy's systematic and non-systematic discretionary measures, and only (Flores & Berdanaz, 2022) concluded that non-systematic discretionary spending decreases income inequality; moreover, in the long run, income inequality alleviates with this spending. In a more specific context, it is concluded that a large body of the literature studies the importance of fiscal changes on income distribution. However, fewer works of literature are available to examine the effect of discretionary fiscal policy on income inequality.

Hence, when we analyze the present literature, it is concluded that the present literature has been linking the fiscal measures of income and expenditures with income inequality. However, the literature largely ignores the fiscal policy's associated measures, discretionary and non-discretionary, and its income distribution consequences. Thus, the potential analysis of discretionary spending and its role in income distribution and the absences of theoretical and empirical literature provide us with a potential area of research. Additionally, the literature provides debatable results about the role of fiscal spending on income distribution in advanced and developing countries. Also, the fiscal authority in developing countries faces lower fiscal restrictions due to the fragile political system<sup>8</sup>; therefore, they use discretionary spending regularly and aggressively. Therefore, examining the influence of non-systematic discretionary

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<sup>8</sup> Fragile states are countries where the citizen are exposed to every shock and the state are branded with weak capacity.



spending on income distribution is important. Thus the present study intended to examine the empirical relation of discretionary spending and income distribution using the panel data of advanced and developing countries.

### **OBJECTIVE OF THE STUDY**

- To assess the impact of non-systematic discretionary Fiscal policy on income distribution in selected developed and developing countries.

### **METHODOLOGY**

In this part of the study, we will focus on the proposed methodology used to examine the relationship between discretionary fiscal spending and income inequality. First, we will present a theoretical argument for the effects of fiscal policy and then develop a conceptual framework for the relationship between discretionary fiscal spending and income inequality. The later section of the methodology discusses the measures for variables and the econometric model. While examining the literature for the theoretical framework, it is concluded that fiscal policy remains controversial among different schools of thought. On one side of the literature, classical economists completely denied the role of fiscal policy in economic performance and stated that fiscal spending does not affect output (Barwell, 2017; Munir & Riaz, 2019). Following these thoughts, it is concluded that fiscal policy cannot affect economic performance, and the labor market remains at full employment with a natural unemployment rate. Therefore, fiscal policy remains ineffective in income distribution. On the other side, Keynesian thoughts believe that fiscal policy plays a vital role in a country's economic performance and stabilizes the business cycle. During the recession, fiscal spending played a lifting role in the economy by increasing the aggregate demand and output (Middleton, 2013). Furthermore, the recession was also characterized by surplus labor that widened the income gap between rich and poor, and fiscal policy played a vital role in eliminating this gap. This channel becomes more popular during and after the Great Recession of the 90s. Likewise, discretionary spending is part of fiscal policy, and the above-mentioned theoretical channel also applies to discretionary spending. This study explores the impact of discretionary fiscal policy on income distribution in developed and emerging economies. Income distribution is the primary dependent variable of this study, while discretionary fiscal spending is the choice variable. The discretionary fiscal spending is predicated as the error term of the change in fiscal expenditures regression and is determined by the lagged term of fiscal expenditures and controlled through macroeconomic indicators like output, inflation, and squared of inflation as

suggested by (Fatás & Mihov, 2013). In literature, income distribution is mostly determined by population and trade openness. This paper intends to use non-systematic discretionary fiscal spending as the choice control determinant of income inequality. To discuss the possible outcome for the impact of discretionary fiscal stimulus on income distribution. One side of the theory concluded that expanding discretionary fiscal spending has crowding-out consequences if financed through public debiting. By crowding-out effect, we mean the increased real interest rate that declines real investment because of the increasing demand for public debt. Furthermore, the decline in investment decreases the output level (Parkin, 2008). As the interest rate rises, the capitalists gain more, and because of low investment and low output, the labor market faces downward pressure contributing to unemployment and income loss; as a result, income inequality rises. Moreover, with an increased real interest rate, the capitalist gain more while the loss in real investment puts downward pressure on the labor market and, as a result, people lose their jobs, which results in the lost income of the people and hence alleviate income inequality. On the other side, the injection of discretionary government spending escalates the aggregate demand by two of its component: the government spending, which is the direct effect, and the household consumption indirect effect (Parkin, 2008). Therefore, enhancing the labor market creates more jobs and high wage rates, reducing income inequality.

### **Measures for Income Distribution**

Some prominent measures for income inequality are the Gini coefficients, Lorenz curve, log-normal distribution, inter-quartile range, coefficient of variations, ratios of income received by lowest and highest income groups, etc. Moreover, some measures like Atkinson's Index, Sen's Index, Theil's entropy measures, Takayama Index, etc., are the normative proxies of income distribution that are subject to reflect the welfare of society in different sections of the population. A good proxy index for income inequality is characterized by the property of Pigou-Dalton transfer sensitivity, independence, symmetry, and population homogeneity (Kemal, 2006). In the income inequality literature, the Gini coefficient was used by (Agnello & Sousa, 2014; Claus *et al.*, 2013; Gupta *et al.*, 2005; Immervoll *et al.*, 2006; Kunawotor *et al.*, 2022; Malla & Pathranarakul, 2022; Paulus *et al.*, 2017). However, (Gupta *et al.*, 2005) use two measures of income inequality the Gini coefficient and Theil indexes. The Lorenz curve and Gini coefficient are those indices of income inequality that are accompanied by most of the property, as mentioned earlier; moreover, they are used by most of the studies in the literature. Therefore, this study suggests using the Gini coefficient to measure income inequality.



### Non-Systematic Discretionary Measures

In this section, we focused on the decomposition of fiscal spending. In theory, fiscal spending is decomposed into three modules. The first component of the fiscal policy is the automatic stabilizers, previously defined. The second part of fiscal is the systematic discretionary fiscal spending determined by the country's macroeconomic indicator. Lastly, discretionary fiscal spending is part of fiscal spending independent of macroeconomic conditions and is incurred for political purposes or someone else (Fatás & Mihov, 2003). Since the fiscal discretions involve the latter two of the fiscal spending, (Aizenman & Marion, 1993) regressed the policy variable on their lagged value to measure the policy uncertainty. However, since this study is interested in the latter component of fiscal policy and since the beginning of the literature, there is no apt method to measure the cyclically adjusted fiscal policy. The difficulty arose due to the simultaneity in determining output and budget deficit that produces biased estimators. So, this study focuses only on public spending as a representative of the fiscal policy following the (Agnello & Sousa, 2014; Fatás & Mihov, 2003; Flores & Berdanaz, 2022). Also, (Chalk, 2002) find out that government expenditures are a good proxy for budgetary policy. Henceforth, when the fiscal measure has been finalized, the fiscal model can be constructed to explain the changes in fiscal expenditures due to macroeconomic indicators.

Following the current literature, this study estimated the following fiscal rule model to determine the change in government expenditures proposed by (Afonso *et al.*, 2010; Agnello *et al.*, 2013; Ali & Khan, 2020; Badinger, 2009; Brueckner & Gradstein, 2014; Fatás & Mihov, 2003, 2013)

$$\Delta G_{i,t} = \alpha_i + \beta_i \Delta Y_{i,t} + \gamma_i \Delta G_{i,t-1} + \sum_{r=1}^j \delta_r X_{r,i,t} + \epsilon_{i,t} \quad (1)$$

Where 'G' represents the government expenditures. Y is the real GDP, and X is the vector of other control variables that include time trend, inflation and inflation squared<sup>9</sup>, and real public debt as recommended by (Agnello *et al.*, 2013; Fatás & Mihov, 2003). The estimation of this equation is sensitive towards endogeneity because of the inclusion of output growth to cover the issue; this study suggested using the Instrumental Variables (IV) with Two Stage Least Square (TSLS) method. The instrument included one lag of inflation and two lags of real GDP following (Fatás & Mihov, 2003). Following this method, the first stage equation of the estimation is formulated as under:

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<sup>9</sup> To capture the price effect the inflation is included. The inclusion of the square term of the inflation is due to the possibility of nonlinear relationships between fiscal expenditures changes and inflation.

$$\Delta Y_{it} = \pi_{0i} + \sum_{r=1}^3 \pi_r I_{ri} + \sum_{j=1}^{j+1} \rho_1 Z'_{jit} + \vartheta_{it} \quad (2)$$

Whereas in the above equation 2 "I" present the vector of three instruments and  $Z'$  is the similar set of exogenous variables discussed for equation 1. The consistency of instruments is examined with F-test. The discretionary spending measured is predicated as the error term of equation 2 and is denoted by  $\epsilon_{i,t}$ .

### The Model

Since the panel data is subjected to several constraints, such as cross-sectional heterogeneity, serial correlation, omitted variable bias, reverse causality, and the problem of endogeneity. Moreover, from income inequality literature, it is also observed that the income inequality index Gini coefficient depends on its lagged value (Clifton *et al.*, 2020; Kunawotor *et al.*, 2022; Malla & Pathranarakul, 2022). Therefore, this paper proposed using the panel dynamic Generalized Method of Moment (GMM) to deal with these constraints. Following the literature on income inequality, this paper determined income inequality by its lagged values, non-systematic fiscal discretionary spending, GDP growth rate, trade, and population; the Autoregressive Distributive Lag (ARDL) version of these variables is presented as:

$$gini_{i,t} = \sum_{j=1}^q \beta_j gini_{i,t-1} + \sum_{j=1}^p \gamma_j X_{i,t-1} + \alpha_i + u_{i,t} \quad (3)$$

Where  $gini$  presents the Gini coefficient, the proposed measure of income inequality.  $\beta$  is the coefficient of lagged Gini depending on the order of serial correlation, and  $X$  is the vector of the control variable that mainly includes the non-systematic fiscal discretionary spending, GDP growth rate, trade, population, and time trend following (Flores & Berdanaz, 2022). In the presence of a lagged effect, the panel fixed effect and the random effect produced biased estimators (Malla & Pathranarakul, 2022). So in this respect, the literature prefers the panel dynamic GMM model that covers all the mentioned problems (Kripfganz, 2019). GMM panel dynamic model mostly prefer in a case where the cross-section (N) is greater than the number of the times ( $N > T$ ). Moreover, in the case of unbalanced panel data with an interior gap, the forward-orthogonal deviation (FOD) GMM estimators are more informative than other GMM estimators (Kripfganz, 2019)<sup>10</sup>. This study analyzes the distributive role of non-systematic discretionary spending in advanced and developing countries. The panel of this paper contains groups of cross-sections greater than time; moreover, for most countries, the Gini data is available in a gap. Therefore, this paper proposed using forward-orthogonal deviation (FOD)

<sup>10</sup> The other GMM estimator's models are one-step and two-step difference and system GMM for detail see (Kripfganz, 2019).

GMM transformation of equation 3 to obtain the results. To check whether the FOD-GMM is correctly specified, the paper uses an over-identification test proposed by (Hansen, 1982; Sargan, 1958)<sup>11</sup>; identification of the model is subject to the instrument's validity and verified from the acceptance of two null hypotheses (Roodman, 2009).

This paper uses the GMM method with FOD transformation because of several reasons. Firstly, this paper incorporated the panel data of 64 countries from 1980 to 2021, so the cross-section number is sufficiently large compared to the time. Secondly, due to lagged significant structure of income inequality, it is preferred to adopt the panel dynamic GMM model. Thirdly, to capture the unobserved cross-sectional heterogeneity, it is required to use GMM. Lastly, as the Gini data is available in gaps and the study uses the panel data with gaps, the use of FOD-GMM is more informative (Kripfganz, 2019; Malla & Pathranarakul, 2022).

**Description of Variable and Data Sources**

Since this study intends to examine the influence of non-systematic discretion spending on income distribution across developed and developing countries using panel data comprised of 32 developed and 32 developing countries<sup>12</sup> from 1980 to 2021. The selection of the country is subjected to the availability of income inequality data extracted from the World Income Inequality Database (WIID). As stated earlier, the remaining data on the explanatory variable are filtered from World Development Indicators (WDI). Table 1 enlists the variable description, while the descriptive statistics are available in Table 2.

**Table 1:** Sources and Definitions of Variables

Variables	Definition	Source
Inequality	“Income inequality is measured through the Gini index, as reported by the source. The Gini Index varies between 0 and 100” (0 for perfect income distribution and 100 represents perfect income inequality)	World Income Inequality Database (WIID)
Non-systematic Discretionary Fiscal Spending	The “non-systematic” or “exogenous” fiscal measures are the implementation of fiscal policy not for achieving the macroeconomic objectives; rather, it is exogenous spending incurred for political motives or other purposes.	(Fatás & Mihov, 2013)
Real Gross Domestic Product (GDP)	“GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without deductions for the depreciation of fabricated assets or the depletion and degradation of natural resources. Data are in constant 2015 prices, expressed in U.S. dollars.”	WDI

<sup>11</sup> Difference Sargan and Hansen tests presented the chi-values and the acceptance of null hypothesis with low chi-values or high probability value suggest that the models is correctly identified.

<sup>12</sup> The list of selected developed and developing country is prepared from World Economic Situation and Prospects 2022, UN report see Appendix in Table A1.

Government Expenditures as a Percentage of GDP	“General government final consumption expenditures comprised current government expenditure on goods and services, including social security benefits and national defense and security. It excluded government military expenditures. It is measured as a ratio of GDP”.	WDI
Debt as a Percentage of GDP	“It included the country's domestic and foreign liabilities such as currency, money deposits, securities other than shares, and loans. It is measured as a ratio of GDP”.	WDI
Inflation	“Inflation, as measured by the annual growth rate of the GDP implicit deflator, shows the rate of price change in the economy. The GDP implicit deflator is the GDP ratio in the current local currency to GDP in constant local currency”.	WDI
Trade	“Trade is the sum of exports and imports of goods and services measured as a share of the gross domestic product.”	WDI
GDP Growth Rate	“GDP is the market value of all goods and services produced by a country in a given time, normally one year, and the GDP growth rate is the percentage change in GDP.”	WDI
Population	“Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. The values shown are midyear estimates”.	WDI

In this study, our dependent variable is income inequality and mostly proxy through the Gini index; the description of the variable is already stated in Table 1. The descriptive statistics in Table 2 reveal that the mean value of the Gini index is 36.89, near the middle range of income inequality; Gini values vary between 18.97 to 73.25, exhibiting that the data set consists of low, middle, and high-income inequality values. Our core explanatory variable is the non-systematic discretionary public spending. It is calculated through the fiscal rule model proposed by (Agnello *et al.*, 2013; Fatás & Mihov, 2013) presented as equation 1 of the study. The main proposed explanatory variable in equation 1 are real GDP, inflation, and public debt, with the dependent variables as government expenditures. The description of the mentioned variable is specified in Table 1.

**Table 2:** Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Inequality (Gini Index)	2079	36.89	8.96	18.97	73.25
Real GDP	2,476	5.71e+11	1.87e+12	1.20e+09	2.33e+13
Non-systematic discretionary public spending	2,429	0.0004111	2.225013	-13.2694	14.2865
Gross Domestic Product (GDP) growth rate	2448	2.88	4.54	-44.9	24.37
Trade	2467	82.38	56.44	11.55	437.33
Population	2688	48984797	1.59E+08	364150	1.41E+09
Govt expenditures as %age of GDP	2476	77.44	10.71	35.9	148.71
Inflation	2447	47.23	477.96	-26.3	15444.38
Debt as a percentage of GDP	951	55.97	36.52	0	252.29

It is observed from Table 2 of descriptive statistics that the data on debt is fewer and available for few countries, do this paper, while calculating the non-systematic discretion, take the debt variable in equation 1 for those countries only for whom data is available. Moreover, the

descriptive statistics table shows that for the calculation of non-systematic discretion, the data on the remaining explanatory variables, real GDP, inflation, and government expenditure, are sufficiently available. Moreover, the descriptive statistics table also presents enough variation of non-systematic discretion public spending captured as 2.224 standard deviations within the range of -13.26 to 14.28.

Following the standard practice of income inequality literature, this paper added some control variables in the model of income inequality, such as trade openness, GDP growth rate, and population, already stated in equation 3 and described in Table 1. Trade openness is the ratio of the sum of imports and exports to GDP; trade divergence leads to specialization and promotes the skill of low-income and middle-income people, thus negatively impacting income inequality, so this study expected the distributive income role of trade (Malla & Pathranarakul, 2022). Another study variable is population; the literature on income inequality argues that the rise in population increases the gap between rich and poor (Kunawotor *et al.*, 2022).

## **RESULTS AND DISCUSSION**

This paper intends to determine the distributive role of non-systematic discretionary fiscal policy in developed and developing countries. This study selected 32 countries in each developed and developing country group for this objective. The data were extracted from World Development Indicators (WDI) and World Income Inequality Database (WIID) from 1980 to 2021. To check the unit root of the variable, this paper employed the proposed test (Pesaran, 2007). The panel unit root test results confirmed that all variables are integrated of order zero<sup>13</sup>. After performing the panel unit root test, the study's results were obtained in five model frames. Model 1 presents the results obtained through pooled OLS and is subjected to various problems, such as the problem of endogeneity, serial autocorrelation, and cross-sectional heterogeneity. Model 2 shows the results obtained by the Two Stages Least Square (2SLS) instrumental variables method covering the heterogeneity problem; however, it is not designed to deal with cross-sectional heterogeneity. The fixed effect and random effect model results were given in models 3 and 4; however, they produced biased estimators in the lagged dependent variable. Model 5 offered the results of a panel dynamic model transformed Forward Orthogonal Deviation two-step Generalized Method of Moment (FOD-GMM), and the model is designed to capture the dynamic effect of the dependent variable; to control the endogeneity of the lagged dependent variable, controlling the omitted variable biased; to captured

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<sup>13</sup> The detail results of LM Pesaran panel unit root test were present in Table A2 of the Appendix  
[www.ijbms.org](http://www.ijbms.org)

unobserved heterogeneity; and finally to control the measurement error. Moreover, it is stated that all the above models were regressed with a robust option for homogeneity. Lastly, it should be understood that the dependent variable is Gini Index and proxy income inequality, and the significant negative sign of the coefficient of the explanatory variable reveals that the variable has the power to reduce income inequality.

**Table-3:** *Non-Systematic Discretionary Fiscal Spending & Income-Inequality (Developed and Developing Countries)*

VARIABLES	(1) OLS	(2) 2SLS	(3) FE	(4) RE	(5) FOD-GMM
<b>Gini index Lagged</b>		0.979*** (0.008)			0.605*** (0.063)
<b>Non-Systematic Discretionary Fiscal Spending</b>	0.021 (0.085)	-0.030 (0.036)	-0.035 (0.040)	-0.033 (0.038)	-0.0305** (0.125)
<b>GDP Growth Rate</b>	0.186*** (0.044)	-0.029* (0.017)	0.011 (0.032)	0.018 (0.033)	-0.072 (0.055)
<b>Log of Total Population</b>	-0.023 (0.154)	0.090** (0.044)	-5.328 (3.896)	-0.780 (1.467)	0.139* (0.082)
<b>Trade Openness</b>	-0.028*** (0.005)	0.001 (0.001)	0.036** (0.014)	0.034*** (0.013)	0.001 (0.002)
<b>Trend</b>	0.021 (0.021)	-0.012* (0.006)	0.045 (0.052)	0.012 (0.040)	-0.027*** (0.009)
<b>Constant</b>	-2.910 (40.631)	22.645* (12.291)	32.805 (68.866)	23.337 (69.529)	53.301*** (18.646)
<b>Observations</b>	1,910	1,593	1,910	1,910	1,505
<b>Number of groups</b>			64	64	64
<b>Number of instruments</b>					14
<b>AR (1) P-Value</b>					0.0000
<b>AR (2) P-Value</b>					0.674
<b>Sargan test for overid:</b>					0.455
<b>Hansan test for overid:</b>					0.663

*Robust standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$*

In Table 3 of the study, we presented the combined results of developed and developing countries. In the panel dynamic model, for model specification, this study applies the Arellano-Bond AR test (Arellano & Bond, 1991) to check the serial correlation. The test result accepts the null hypothesis for AR (2); moreover, it rejects the null hypothesis of AR (1), confirming the dynamic effect of the model with no more serial correlation. To check the over-identification condition, we employ Hansen and Sargan tests (Hansen, 1982; Sargan, 1958), and the null hypothesis of both tests is accepted, suggesting that the model is correctly specified with valid instruments. Moreover, Model 5 uses fourteen instruments, less than the number of



groups, which is sixty-four. As previously stated, the results mentioned in columns 1 to 4 might be alleged because of numerous problems. However, the results lying in column 5 are estimated through two-step FOD-GMM and controlling these problems; hence the results remain valid. In respect of non-systematic discretionary fiscal policy, most of the models of the study assert that it hurts Gini Index, and this result becomes significant in two-step FOD-GMM. Referring to Model 5, we can conclude that a one percent increase in non-systematic discretionary spending declines income inequality by 3%. In other words, countries that practice the discretionary fiscal policy would have low-income inequality compared to those that do not exercise it.

The justification for the income distributive role of non-systematic discretionary fiscal policy is that the non-systematic fiscal spending intensifies the aggregate demand due to the direct effect government expenditures component of aggregate demand. At the same time, this spending has an indirect positive impact on the consumption component and an indirect negative impact on the investment<sup>14</sup> component of aggregate demand. Hence, it is argued that due to the positive impact of two component of aggregate demand and the declining effect of investment, only the government spending multiplier is greater than one and lead to high output and high per capita output. Moreover, non-systematic discretionary public spending is incurred for reasons different from the achieving of macroeconomic objectives, and it is the result of extraordinary non-economic conditions or exogenous political processes, such as spending for political purposes. It mainly involves development projects that create labor demand in the labor market and, as a result, create jobs opportunity and lower the unemployment rate. Moreover, due to increased labor demand, the price of labor factor experienced upward pressure, and due to the positive wage effect, income inequality declined. These results are also supported by (Flores & Berdanaz, 2022), which reveals that income inequality decline with non-systematic discretionary public spending. Onward, we discuss the results of the explanatory control variable, and the results of the study indicate that most of the estimated model, including the FOD-GMM model of the economic growth rate, has no effect on income inequality, and our results are consistent with those (Papanek & Kyn, 1986). The income inequality literature mostly uses the population as the explanatory control variable; the FOD-GMM model reveals the positive and significant impact of the population on the Gini index.

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<sup>14</sup> The fiscal spending that financed through domestic debt increase the real interest and decline the investment level which is termed as crowding-out affect.

The results concluded that with the increase in population, income inequality reduces, and our results are also supported (Kunawotor *et al.*, 2022; Malla & Pathranarakul, 2022). Trade openness is the explanatory control variable and is causally used by income inequality literature; the results of model 5 show the insignificant impact of trade openness on income inequality and are supported by (Flores & Berdanaz, 2022).

**Table-4:** Non-Systematic Discretionary Fiscal Spending on Income-Inequality (Developed Countries)

VARIABLES	( 1 ) OLS	( 2 ) 2SLS	( 3 ) FE	( 4 ) RE	( 5 ) FOD-GMM
<b>Gini index lagged</b>		0.959*** (0.018)			0.702*** (0.062)
<b>Non-Systematic Discretionary Fiscal Spending</b>	0.048 (0.102)	-0.057 (0.060)	0.028 (0.060)	0.010 (0.063)	-0.123 (0.141)
<b>GDP Growth Rate</b>	0.166*** (0.051)	0.006 (0.026)	0.029 (0.047)	0.034 (0.049)	-0.095 (0.059)
<b>Log of Total Population</b>	0.628*** (0.130)	0.059 (0.056)	-8.476 (5.749)	0.245 (0.916)	0.065 (0.060)
<b>Trade Openness</b>	-0.016*** (0.003)	-0.000 (0.002)	0.012 (0.016)	0.007 (0.011)	-0.003** (0.001)
<b>@Trend</b>	0.196*** (0.013)	0.004 (0.008)	0.175*** (0.049)	0.148*** (0.038)	-0.045*** (0.013)
<b>Constant</b>	-369.020*** (25.738)	-8.000 (16.618)	-182.35*** (57.326)	-268.3*** (66.752)	89.156*** (26.259)
<b>Observations</b>	988	867	988	988	833
<b>Number of groups</b>			32	32	32
<b>Number of instruments</b>					14
<b>AR (1) P-Value</b>					0.0000
<b>AR (2) P-Value</b>					0.567
<b>Sargan test for overid:</b>					0.421
<b>Hansan test for overid:</b>					0.542

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 4 presents the results of five models for a developed country. According to the results, there is no income distribution role of non-systematic discretionary fiscal policy in developed countries. The non-systematic discretionary fiscal policy coefficients remain insignificant in all models, and no model presents the significant impact of non-systematic discretionary spending on income inequality in developed countries. The insignificant results of the non-systematic discretionary public spending in developed countries are justified with arguments that developed countries rarely practice non-systematic discretionary spending compared to

developing countries. The descriptive statistics of non-systematic discretionary spending presented in Table A3 of the Appendix reveal that the non-systematic public spending of developed countries varies within the range of -11.139 to 7.865 with a standard deviation of 1.519 as compared to developing countries that vary in the range of -13.269 to 14.286 with standard deviation 2.743. These statistics indicated that developing countries rarely used non-systematic discretionary public spending.

As early discussed in the literature review that fiscal policy instruments play an income distributive role in developed countries, while in developing countries, only conditional fiscal spending plays an important role in income distribution (Anderson *et al.*, 2017; Kunawotor *et al.*, 2022; Malla & Pathranarakul, 2022; Padhan *et al.*, 2022). Following these results, this study argues that the developed country regularly uses the unemployment benefits component of the fiscal policy (Moffitt, 2014), reducing the risk of increasing income inequality and resulting in the significant role of fiscal policy in the income distribution of the developed country. However, due to the rare practice of non-systematic discretionary public spending by developed countries, this study shows the insignificant impact of this spending on income inequality. Moreover, the results of the remaining control variables indicated that in the case of developed countries, trade openness significantly reduced income inequality. While the GDP growth rate and population remain insignificant and have no role in the income distribution of developed countries, the justification for these results is already discussed in the previous section.

Table-5 tabulated the results of the study for developing countries. This study incorporated the data of 32 developing countries, whose lists are attached in the Appendix with Table-A1. As previously discussed, the results mentioned in columns-1 to 4 are suspected and suffer from multi-econometric problems; however, model-5 FOD-GMM covers all these problems and produces more accurate results than other models. All the diagnostic tests in Table-5 are consistent with model specifications and concluded that the model is correctly specified. The results of all models showing the negative impact of non-systematic discretionary on income inequality; however, model 5 of the study confirm that this result is significant. Hence it is concluded that non-systematic discretionary spending has an income-distributive role in developing countries. It is because the political setup in developing countries regularly uses fiscal policy for their political purposes compared to developed countries. The range and standard deviation of non-systematic fiscal discretionary spending in Table-3 of the Appendix

justify it. The intensive use of non-systematic discretionary spending boosts the labor market, creates job opportunities, and increases the wage rate, resulting in declining income inequality. Following the literature on income inequality and fiscal policy, it is claimed that in developing countries, fiscal policy remains ineffective in income distribution; nevertheless, the literature also claims that conditional fiscal spending in the form of education and health expenditures reduces income inequality (Anderson *et al.*, 2017; Coady & Gupta, 2012; Paulus *et al.*, 2017; Sidek, 2021). However, this study concluded that non-systematic discretionary public spending plays an income distribution role in developing countries after calculating the undetermined component of the fiscal policy.

**Table-5:** Non-Systematic Discretionary Fiscal Spending on Income Inequality (Developing Countries)

VARIABLES	(1) OLS	(2) 2SLS	(3) FE	(4) RE	(5) FOD-GMM
<b>Gini index lagged</b>		0.981*** (0.012)			0.591*** (0.064)
<b>Non-Systematic Discretionary Fiscal Spending</b>	-0.083 (0.100)	-0.015 (0.043)	-0.062 (0.043)	-0.065 (0.043)	-0.0323*** (0.118)
<b>GDP Growth Rate</b>	0.061 (0.057)	-0.046** (0.023)	0.069 (0.045)	0.056 (0.041)	-0.111 (0.037)
<b>Log of Total Population</b>	-0.773*** (0.214)	0.123* (0.066)	6.113 (4.377)	1.568 (1.618)	0.206** (0.093)
<b>Trade Openness</b>	-0.025*** (0.005)	0.001 (0.002)	0.021 (0.026)	0.020 (0.024)	0.000 (0.003)
<b>Time Trend</b>	-0.160*** (0.029)	-0.021** (0.010)	-0.173** (0.082)	-0.121* (0.064)	-0.038** (0.017)
<b>Constant</b>	376.976*** (57.730)	41.298** (19.965)	285.723** (115.656)	257.022** (111.215)	75.394** (36.611)
<b>Observations</b>	922	726	922	922	672
<b>Number of groups</b>			32	32	32
<b>Number of instruments</b>					14
<b>AR (1) P-Value</b>					0.0003
<b>AR (2) P-Value</b>					0.508
<b>Sargan test for overid:</b>					0.961
<b>Hansen test for overid:</b>					0.814

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Moreover, the results of developing countries showing the negative impact of GDP growth rate on the Gini index; however, the results remain insignificant in all models. Economic growth doesn't affect the income distribution of developing countries; the justification of the results is previously discussed in detail. Furthermore, the results also show the significant positive

impact of population on the Gini index and indicate that the population increase causes unequal income distribution. These results are supported by income inequality literature (Flores & Berdanaz, 2022; Kunawotor *et al.*, 2022; Malla & Pathranarakul, 2022). Additionally, the results of developing countries remain insignificant in the case of trade openness, and it is observed that trade liberalization doesn't affect the income distribution of developing countries.

### **CONCLUSION AND POLICY IMPLICATION**

Income inequality has risen in recent years within developed and developing countries regardless of economic prosperity and ever-increasing economic growth worldwide. With time, countries across the globe are engaged in collecting information about income inequality through numerous surveys and, as a result enriching the databank of income inequality. Now more researchers are diverting to income inequality literature and trying to find out the factors influencing income inequality. Among them, the consideration of fiscal as a cure for income distribution is interesting and attracts more researchers. The fiscal policy has various components: automatic fiscal and discretionary fiscal. The discretionary fiscal component is further assorted as systematic discretions that are connected with macroeconomic objection and non-systematic discretions, which are not designed for achieving the macroeconomic objectives; rather, it is exogenous spending and may be incurred for political benefits or someone else other. Most of the literature on income inequality and fiscal policy focuses on all component of fiscal policy and state that fiscal policy plays an unconditional role in income distribution of advanced countries. However, the fiscal policy in developing country remain ineffective and plays no role in income distribution except the conditional one, which states that if the fiscal spending were incurred on education and health or any other public goods, resulting in the decline in income inequality of the developing countries.

As observed, most developing countries regularly practice the non-systematic powers of fiscal policy, especially for their political benefits. A country's macroeconomic conditions are very sensitive toward these practices, creating the business cycle and fluctuations in economic activities. These fluctuations cause disturbances in the factors market and disturb the reward of factors of production that cause the redistribution of income among the various sectors of the economy. However, insufficient literature empirically examined the impact of non-systematic discretion on income distribution across the country. So this study intends to determine the impact of non-systematic discretion fiscal policy on income distribution worldwide. The results

of the study are drawn into three groups. Firstly, I aggregate analysis of the study results showing the significant role of non-systematic fiscal policy in income distribution worldwide. Secondly, in developed countries, this study concluded that non-systematic fiscal discretion measures have no role in reducing income inequality. Finally, for the developing countries, this study concluded that non-systematic fiscal measures influence their income inequality, and the income inequality of developing countries sufficiently falls with the expansionary non-systematic discretionary fiscal policy. As a policy recommendation, it is suggested the widening income inequality of developing countries can be reduced with the use of non-systematic discretionary public spending. However, it should be incurred under strict accountability as most developing nations suffer from malpractices and corruption. It should be noted that this paper has a few limitations, such as the availability of data on income inequality. The data are missed for most countries and available in gaps, so for future research, it is suggested to design the data in a five-year mean average to remove the gap and missing observation from the data set. Moreover, the conditional study can also be conducted for the role of non-systematic discretionary fiscal, especially with transparency indices, to assess the ultimate effect of the non-systematic discretionary spending across the country realities.

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**Annexure**

**Table A1:** List of Developed and Developing Countries included in the sample

Developing Country		Developed Country	
1	Argentina	33	Australia
2	Armenia	34	Austria
3	Belarus	35	Belgium
4	Bolivia	36	Bulgaria
5	Brazil	37	Canada
6	Chile	38	Croatia
7	China	39	Czech IA
8	Colombia	40	Denmark
9	Costa Rica	41	Estonia
10	Dominican Republic	42	Finland
11	Ecuador	43	France
12	El Salvador	44	Germany
13	Georgia	45	Greece
14	Honduras	46	Hungary
15	Indonesia	47	Ireland
16	Jamaica	48	Italy
17	Kazakhstan	49	Latvia
18	Korea, Rep.	50	Lithuania
19	Kyrgyz Republic	51	Luxembourg
20	Moldova	52	Netherlands
21	North Macedonia	53	New Zealand
22	Pakistan	54	Norway
23	Panama	55	Poland
24	Paraguay	56	Portugal
25	Peru	57	Romania
26	Singapore	58	Slovak Republic
27	South Africa	59	Slovenia
28	Thailand	60	Spain
29	Turkiye	61	Sweden
30	Ukraine	62	Switzerland
31	Uruguay	63	United Kingdom
32	Venezuela, RB	64	United States

**Table A2:** Results of Im Pesaran Panel Unit Root Test at level form

Variable	T-Bar	Z-T-Tilde-Bar	Z-T-Tilde-Bar	P-Value
<b>Gini Index</b>	-2.1249	-1.8046	-3.6539	0.0001
<b>Non-Systematic Public Discretionary Spending</b>	-5.9043	-4.1465	-26.9931	0.0000
<b>GDP Growth Rate</b>	-4.6835	-3.6567	-22.7050	0.0000
<b>Trade</b>	-2.5736	-2.3439	-8.8855	0.0000
<b>Log of Total Population</b>	-5.9920	-1.6993	-2.3309	0.0099

**Table A3:** *Descriptive Statistics of Non-Systematic Discretionary Public Spending in respect of Developed Countries and Developing Countries*

<b>Country</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
<b>Developing</b>	1232	-.013	2.743	-13.269	14.286
<b>Developed</b>	1197	.014	1.519	-11.139	7.865