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The Impact of Public Debt on Income Inequality

An Empirical Analysis for Developed and Developing Countries

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Abstract

Given the current increase of public debt among governments worldwide and the shift in the composition of that debt toward private sector borrowing, it has become necessary to examine the potential influence of public debt on inequality as a contribution to diagnosing the causes of economic inequality and identifying its mechanisms, especially given the high level of inequality worldwide over the past three decades. This study conducts an empirical investigation of the relationship between public debt and income inequality, comparing the possible effects in developed and developing nations, by employing Fixed-Effects panel regression for 30 developing and developed countries from 1990 to 2020. It is shown that public debt has a significant positive effect on income inequality for the pooled group of selected countries (the full sample). However, the study does not provide robust evidence regarding differences between the debt-inequality sensitivity in the sub-samples of developed and developing countries.

Keywords: Public debt; Inequality; Openness; GINI-coefficient

JEL : E25; E37; E60

1. Introduction

Since the 1980s, income inequality has risen practically everywhere. It arises from differences in salaries, education, experience and resources availability (Mdingi and Ho, 2021). Although most of the developed economies exhibit natural income inequality in the competitive market, extreme inequality can negatively affect society and the economy by creating political, economic, and social instability (Dabla-Norris, et al., 2015).

The distribution of wealth and income in contemporary societies is influenced by a number of variables, including social norms, macroeconomic situations, institutions, and economic policies (Dabla-Norris et al., 2015). An examination of income inequality dynamics over the last four decades shows that many developed and developing countries have experienced a persistent worsening of income

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and wealth inequality (Milanovic, 2016). For example, during the 1995-2021 period, merely 2% of the actual wealth growth was attributed to the world's poorest half of population, whereas the richest 1% accounted for 38% (Chancel et al., 2021). When the real income growth rates are examined, it is found that during the 1980-2020 period, the lowest 50% of the global population only accounted for 9% of the real income gain, while the wealthiest 1% accounted for 23% (Chancel et al., 2021). Hence, these numbers imply that economic inequality has worsened in the recent decades. There exist many studies examining the dynamics of economic inequalities in terms of trends and determinants (Piketty, 2014; Bahmani-Oskooee et al., 2008; Tridico, 2018; Furceri & Ostry, 2019). Figure (1) shows the severe concentration of global income and wealth in 2021.

In addition, Figure (2) provides valuable insights for a deeper understanding of global income inequality and its evolution throughout the last 200 years. It indicates that between 1820 and 1910, the ratio of the top 10% to the bottom 50% of worldwide wealth (the "within-country ratio") climbed progressively. However, between 1910 and 1980, the ratio dramatically fell[1], and finally rose again since 1980. However, across-country inequality increased between 1820 and 1980, and then sharply declined since 1980. The world is still quite unequal today since the disparity between countries is growing, despite strong economic growth in emerging economies.

Given that income inequality is influenced by multiple factors, globalization through the movement of goods and people across countries can significantly affect income distribution (Harrison et al., 2011; Helpman

Figure 1 *Global income and wealth inequality, 2021*

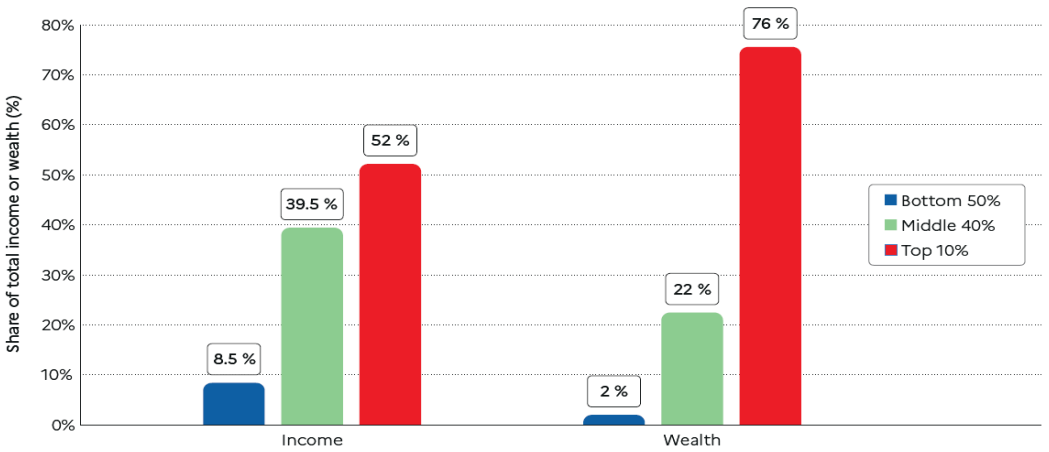

Figure 1. Global income and wealth inequality

Source: Chancel, L., Piketty, T., Saez, E., Zucman, G. et al. World Inequality Report 2022, World Inequality Lab wir2022.wid.world

[1] In his seminal work, "Capital in the Twenty First Century", Thomas Piketty attributes this decline in income inequality in that interval to the major economic and political shocks triggered by the Great Depression and the two World Wars, emphasizing that it is not a natural outcome of inequality mechanisms within the capitalism system (Piketty, 2014).

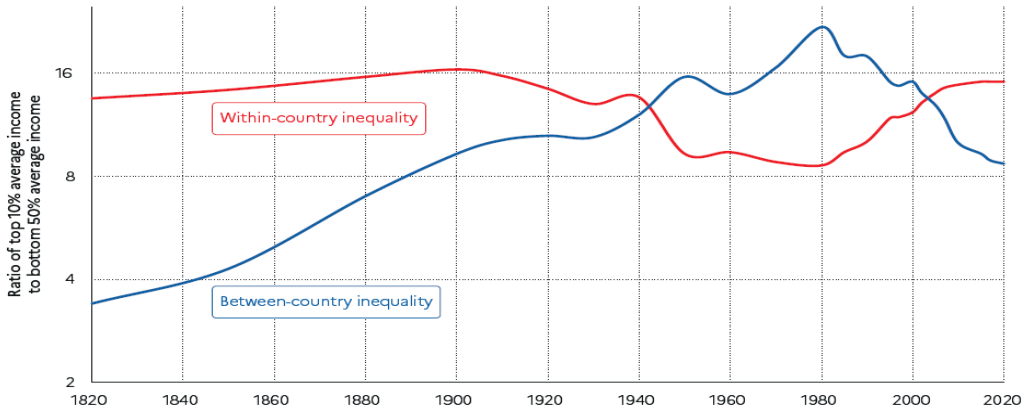

Figure 2. Global income inequality: 1820-2020

Source: Chancel, L., Piketty, T., Saez, E., Zucman, G. et al. World Inequality Report 2022, World Inequality Lab wir2022.wid.world

et al., 2017). The prevalent theories of trade, such as the Heckscher-Ohlin or Ricardian theories, suggest that countries specialize in products and services where they have comparative advantages due to factors like input abundance and technology (Krugman et al., 2017). When countries specialise within the global economic system, they begin importing goods and services that they do not have comparative advantages in. For example, rich countries such as the US and the UK would import labour-intensive goods from other countries with abundant labour input such as China and India. The returns for unskilled labour in the US and the UK may decline relative to other factors of production such as skilled labour and capital. As a result, globalisation and international trade can be important factors affecting income distribution in these countries. Similarly, the flows of labour or migration are shown to be among the factors with crucial implications for income inequality (Bastia, 2013). Moreover, policy variables (such as taxation, trade union density, and minimum wages) also affect the income shares in an economy (Piketty, 2015).

Our goal is to compile information about how public debt affects income disparity in both developed and developing nations. The importance of such analysis is underscored by the fact that public debt has increased recently and its composition has rapidly altered. Governments have become increasingly indebted to private creditors. In IDA-eligible countries, the proportion of GNI devoted to foreign debt climbed from 20% to 36.2%, while the portion owing to private creditors went from 5% to 21% from 2010 to 2021 (World Bank 2022b).

The remainder of the paper is constructed as follows: section two presents the literature review, section three shows the theoretical framework, while section four presents the data and the methodology, section five presents the econometric results and we conclude in section six.

2. Literature Review

2.1. Income Inequality: Trends and Determinants

Inequality in wealth, income, racial/ethnic, and gender can all be used as lenses through

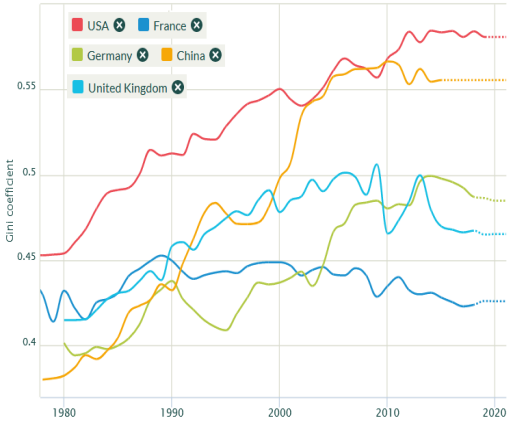

Figure 3. Gini coefficients for five leading economies

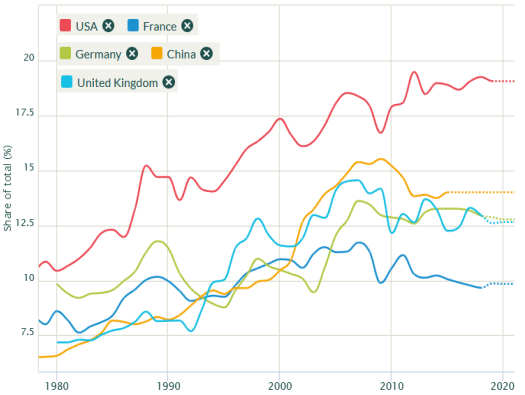

Figure 4. The Top 1% Income Shares five leading economies

Source: World Inequality Database (2022, n.p.).

which to view economic disparity. Given that income inequality is a broad concept, the literature has developed various indicators to measure the level of inequality in an economy (Jenkins, 2017). Of all these indicators, the most widely applied indicator is the Gini coefficient (Milanovic, 1997). This indicator ranges between 0 and 1. The lowest value of 0 shows that the society has a perfectly equal distribution of income, with every household having the same income level. The highest value of 1 corresponds to the situation of perfect inequality, with a single household taking all national income and the rest taking no income. In addition to the Gini coefficient, the income shares of various percentiles, such as the lowest 50%, top 10%, or top 1% are also directly used as indicators in the literature (Alvaredo, 2011). The literature also utilises different measures such as the Atkinson index, the coefficient of variation, the decile ratios, the Kakwani progressivity index, and the Sen poverty index (De Maio, 2007). In order to display the inequality trends, the income shares and the Gini coefficient are the most commonly used indicators.

As the aforementioned discussions demonstrate, the Gini coefficient and the income shares of various demographic groups are the primary indices for gauging income inequality. In this context, Figure 3 presents the evolution of the Gini coefficients for the prominent five countries in the world (i.e., the US, China, Germany, France, and the UK), while Figure 4 depicts the changes in these nations' top 1% income share over time. Overall, these two indicators show a trend of worsening income disparity in major economies over the last four decades, although the magnitude of this deterioration varied across countries and was associated with significant social, economic, and political consequences (Neckerman & Torche, 2007).

After examining the vast amount of research on the causes of income inequality, the following dimensions are shown to be associated with the main causes: international trade, migration, technology, automation, government policies, labor market institutions, and globalization. In the case of globalisation and international trade flows, the specialisation of countries in different segments of goods

and services can have major implications for the incomes of different factors of input such as unskilled labour, skilled labour, and capital (Harrison et al., 2011; Grossman & Helpman, 2018).

Regarding the technology dimension, Krusel et al. (2000) show that a significant amount of the US's deteriorating income distribution may be attributed to the increase in the availability of skilled labour and the corresponding skill premia. These dynamics can be related to skill-biased technological change. In addition, relevant studies such as Goos et al. (2009, 2014) find that automation and technological changes can lead to the loss of medium-wage jobs and create job polarization in economies (i.e., the rise of low and high-paying jobs at the expense of medium-paying jobs). Hence, the increasing trends in inequality over the past forty years may also be explained by these technical variables.

In addition to globalisation and technology as important determinants of inequality dynamics, the literature also identifies policy variables to understand inequality trends. For instance, as countries switched from welfare-state policies to neoliberal policies starting from the early 1980s (Harvey, 2007), labour market policies and institutions have also experienced major changes. Along with the labour market institutions, direct policy measures such as taxation and minimum wages also significantly affect the income distribution dynamics (David et al., 2016; Piketty & Cantante, 2018).

Overall, the pertinent research highlights the primary causes of income inequality dynamics and trends, namely, the globalization and technology to labour market institutions and regulations. However, the literature has a rather narrow focus when it comes to public financial concerns, particularly government debt. For example, different studies such as Acemoglu (2002) and Glaeser (2005) do not mention the role of public debt or other financial variables in accounting for inequality dynamics.

2.2. Public Debt and Inequality

A small number of research projects investigate the connection between inequality and public debt. For example, Azzimonti et al. (2014) show that the global economy has seen an increase in financialization and governmental debt during the 1980s, along with a little deterioration in income distribution. They contend that these trends are essentially related. Typically, economic cycle management and war funding are strongly linked to the dynamics of governmental debt. In this context, the authors claim that governments increased their public debt levels, as a policy tool or insurance against the rising income inequality levels. Similar arguments are put forward in the case of household debt, as well, in the sense that rising inequality levels are associated with higher household debt levels (Iacoviello, 2008). While these studies provide theoretical mechanisms connecting debt and inequality, they do not conduct any cross-country empirical analyses to support their arguments as they mainly rely on model simulations. In addition, these studies do not provide comprehensive evidence in terms of the sample of countries. Examining the implications of public debt, particularly its effects on income inequality, is crucial given that public debt levels have risen to extremely high levels in both developed and developing nations over the past 20 years.

3. Theoretical Framework

Previous literature demonstrates that the income distribution has deteriorated in many nations with the adoption of neoliberal structural and policy reforms during the past 40 years. The research on the patterns and causes of income inequality is substantial and ever-expanding. The literature identifies globalisation, international trade, migration, technology, automation, and policy factors as the leading factors of income inequality. A new strand of studies also looks at the role of credit and debt in inequality dynamics. However, there is a significant gap in the literature, particularly when it comes to how public debt affects income disparity. In addition, a few studies look at this relationship, but they do not discuss the possible differences across developed and developing country groups.

Theoretical factors linking public debt to income inequality are discussed in pertinent publications including Salti (2015) and Karlin (2018). From a theoretical point of view, public debt can be relevant for income distribution in terms of financing expenditures and debt burden. On one hand, higher public debt levels can be used to support transfer and subsidies, thereby decrease income inequality. However, Barro (2003) notes that government expenditures might have lower efficiency and can result in lower growth rates. In this case, government expenditures financed by public debt can have negative effects on income distribution. Hence, the inequality impact of the expenditure channel is not very clear. On the other hand, the government needs to make some transfers from the fiscal resources to holders of government debt. Since these debt holders would be generally wealthy agents and institutions in a country (Salti, 2015), the debt burden channel can lead to a worsening in income distribution. Hence, from these theoretical and analytical considerations, one may conclude that the ultimate consequence of public debt would be an escalation in inequality. In addition to this argument, our paper investigates the potential difference for this effect between developed and developing countries. In this context, the relevant two research hypotheses are postulated as follows:

Hypothesis 1: Higher public debt levels are associated with higher income inequality levels.

Hypothesis 2: Developing countries have higher sensitivity of inequality to public debt compared to developed countries.

The first research hypothesis argues that the negative distribution effects of public debt are dominant, similar to the arguments of Salti (2015) and Karlin (2018). Namely, public debt can be financed by taxation on the whole public, whereas the financiers of the public debt can be the top income percentiles in a country. Therefore, in an economy, public debt may represent a shift of revenue from low-income to high-income groups. As another possible mechanism, high public debt levels would require larger portions of public finance as debt payment burdens. In return, the government can have limited fiscal room to address inequality issues. Hence, these channels would imply that higher public debt levels would lead to higher inequality levels. The second study hypothesis posits that the processes mentioned above may be more robust in emerging nations as opposed to industrialized nations. Different findings are predicted between the groups of the countries due to numerous reasons and mechanisms; hence, the sample is divided into two subgroups: developed and developing countries. For example, it is likely that the

financial development levels in developing countries are lower and the public has limited access to government financing instruments. Hence, the wealthy parts of society can get interest and capital incomes from public debt. Moreover, the borrowing rates for public debt of developing countries are generally higher due to inherent risks compared to developed countries. As other possible factors, the lower quality of institutions and higher levels of corruption can restrict the ability of the state to direct debts for the benefit of the general public. Therefore, these differences can translate into higher debt service burdens and debt volatility levels for developing countries. In return, income distribution in these countries can be more sensitive to the public debt dynamics. This study accounts for the impacts of six pertinent elements to show the liaison between governmental debt and income inequality. We explain these factors and discuss the channels through which each of them affects inequality:

- **Economic growth:**

When public debt is utilized to fund productive investments, such as roads, hospitals, health facilities, and other public infrastructure, it leads to greater economic growth and income through the creation of jobs, which in turn has a favorable impact on income disparity. However, when public debt is utilized to fund unproductive initiatives, inequality is always severely impacted (Aghion & Howitt, 1998). Additionally, through progressive taxation, government revenues rise in tandem with economic development. The government can lessen economic disparity by implementing redistribution measures (Ostry, Berg, & Tsangarides, 2014). The government may also control the debt by never enacting restrictive fiscal measures when economic growth exceeds the interest rate on public debt. This is another way that changes in public debt are linked to economic growth. (2019, Blanchard). Public debt and private investment are seen as complementary when a nation does well economically, which leads to further economic expansion. Conversely, a low rate of economic growth leads to a crowding-out effect, which lowers production, eliminates jobs, and rises inequality (Cecchetti, Mohanty, & Zampolli, 2011).

- **Unemployment:**

High unemployment rates result in lower government income tax receipts but more spending on welfare and social assistance programs. The government would be unable to continue providing assistance if the unemployment rate in the economy continued to rise, leading to austerity and a rise in income inequality (Ball, 2014). A high unemployment rate also lowers wages in the economy, particularly for those with lower and moderate incomes, which increases inequality (Heathcote, Perri, & Violante, 2010). Furthermore, the duration of unemployment increases when a high unemployment rate and a high public debt are present. As a result, skills and the competences of the unemployed are worsened, which lowers their chances of finding work and so increases inequality. Because of the nation's massive public debt, it is unable to offer these jobless people any training programs, which exacerbates inequality (Nickell, 1997).

- **Female labour force participation:**

Women's increased engagement in the labour force boosts economic growth via boosting productivity. Tax revenues rise in parallel with GDP growth, allowing the

government to borrow less money and, thus, reduce the national debt. The government should reduce income disparity by implementing effective distribution measures. Income disparities across households can be lessened since the combined income of the male and female household members increases the overall income. The need for education rises with increased female income, which influences children's educational attainment and, ultimately, the long-term decrease of family income disparity (Esping-Andersen, 2007 and Bandara, 2015). In contrast, the FLFP rate can have a beneficial impact on income disparity since women typically work part-time, low-paying, or insecure employment, which increases income equality (Blau & Kahn, 2017; Goldin, 2014). Moreover, family income is larger than that of single-income families when both the male and female members of the home are employed (Greenwood et al., 2014).

- **International trade:**

Both skilled workers and the capital owners often stand to gain from international commerce during periods of trade openness. Capital owners' imports of technology and opportunities for highly trained work increase the gap between the affluent and the poor, hence increasing income inequality (Harrison et al., 2011; Helpman et al., 2017 and Okeke & Alexiou, 2025). However, increased trade has a favorable impact on economic growth, which raises government revenues. Effective redistribution measures also boost the income of the poor, reducing inequality. Additionally, the Stolper-Samuelson Theorem (1941) states that trade openness reduces income inequality in emerging nations by raising wages for the plentiful low-skilled labour and lowering wages for the scarce high-skilled workers. For developed nations, the opposite is true.

- **Political factors:**

Unstable political conditions that result in a nation's debt enable the government to impose austerity measures, which directly affect those with lower incomes (Stiglitz, 2012). Furthermore, unstable conditions may hinder government investment in youth training and skill development, which might result in a drop in youth job opportunities (Perotti, 1996). The government can raise borrowing because of the lack of investment optimism when political uncertainty is high (Woo, 2003).

- **Collective bargaining:**

Income disparity grows when collective bargaining raises wages because it deters companies from hiring workers and encourages them to use machinery and robotics to replace labour, particularly for lower-paid workers, Lemieux and Dinardo (1997). Additionally, Card (2001) shows that unions typically represent high- and middle-income workers, leaving low-income workers behind, which raises the level of inequality.

4. Data and Methodology

The section is organised into two parts, with the first part introducing and describing the dataset and the second part giving the details of the methodological approach.

4.1. Data

The main variables of interest in the empirical analysis are public debt and income inequality. Public debt is a relatively clear variable, which shows the financial liabilities of a government, including domestic liabilities and external liabilities. This variable is commonly available from public and reputable sources such as the World Development

Indicators, the World Bank, the BIS, and the OECD. In order to make the relevant debt numbers comparable across countries, the public debt variable is measured as a ratio to the GDP of the corresponding countries. The decomposition of the public into domestic versus external components (Salti, 2015) or domestic currency versus foreign currency denomination can be useful to understand the public debt dynamics and effects in more detail. However, given the scope of the present study and the data availability issues, these decomposition factors are not included in the empirical analysis.

While the measurement of public debt is relatively easy and this variable is widely available from the main public sources, measuring income inequality is a multifaceted problem. As discussed in the previous section, the inequality level can be conceptualised and measured in different ways (De Maio, 2007). The leading inequality indicators are the Gini coefficient and the top income shares (like the upper 10% and upper 1% income shares) (Alvaredo, 2011). In addition, one can use other indicators such as the Atkinson index, the coefficient of variation, the decile ratios, the Kakwani progressivity index, and the Sen Poverty index. Given that the mainstream of the literature use the Gini coefficients as their main dependent variable, the present study also follows the same convention to produce comparable results. Even when the Gini coefficients are chosen as the main measure of income inequality, there can be additional issues with the measurement of specific income types (Armour et al., 2013). For example, the incomes of households can be measured based on market activities, before any involvement of government policies. Then, this Gini coefficient indicator would be based on market incomes. However, governments conduct many different policies such as income taxes, subsidies, and transfers. Then, the disposable incomes of households can be very different from their market incomes. As a result, another approach can use the Gini coefficients based on disposable incomes. Since both indicators provide different information on the content of household income, it would be feasible to use one or two of them in the analysis. In this context, the present study focuses on Gini market income to analyse the potential influence of public debt on income disparity. Besides, the study utilises Gini disposable incomes to throw light on the effectiveness of government policies in reducing income inequality. The Gini coefficients are widely available from major public sources such as the World Bank (2022) and the OECD (2022). However, since the underlying surveys are not generally conducted every year for some countries, there can be gaps in the corresponding Gini coefficient estimates. In this context, one important source to overcome this challenge, as well as to make different indicators comparable across countries, is the Standardized World Income Inequality Database (SWIID) of Solt (2016). Hence, this dataset is used to calculate the two Gini coefficients for a vast array of developed and developing nations.

In evaluating the impact of public debt on income inequality, it is crucial to include the influence of other noteworthy variables. As the literature review section has demonstrated, specialization and flows in international commerce may have a significant impact on the returns on production components and alter the way income is distributed (Harrison et al., 2011; Helpman et al., 2017). Controlling the effect of global trade on income disparity would thus be essential. In this context, the

trade ratio can be a control variable in the empirical analysis. Kus (2012) provides an exhaustive version of the main control variables in understanding the determinants of income disparity. The author also incorporates trade union density, GDP growth rate, unemployment rate, female labour force participation rate, and collective bargaining coverage in addition to the trade variable.

Regarding the data sources, the dependent variable is the inequality while the independent variable is the public debt to GDP ratio. The control variables are obtained from the four public data sources of the SWIID by Solt (2016), the World Development Indicators (WDI) by the World Bank (2022), the credit database by the BIS (2022), and the labour market database by the OECD (2022) covering the period (1990 – 2020). The development status of countries is determined based on the Human Development Index (HDI) level. In this regard, a sample of 30 developed and developing countries is selected: Australia, Belgium, Canada, Chile, Colombia, Japan, the Czech Republic, Denmark, the United States, France, Israel, Germany, Hungary, Ireland, Italy, Greece, Korea, Turkey, Mexico, Sweden, New Zealand, Norway, Poland, Austria, Portugal, Spain, Switzerland, Netherlands, the United Kingdom, and Finland.

4.2. Methodology

Panel data regression techniques, such as pooled OLS regressions and fixed-effects regressions are used in pertinent research that examine the link between income inequality and public debt, such as Salti (2015) and Karlin (2018). The current study used the fixed-effects technique as its empirical approach, as the pooled OLS method fails to include the country effects and panel data characteristics of the dataset. In this framework, we consider the following model:

$$Gini\ Market\ Coefficient_{i,t} = \alpha + \beta Public\ Debt_{i,t} + \gamma Control\ Variables_{i,t} + \varepsilon_{i,t}$$

Where countries are denoted by i while years are denoted by t. The variables are summarized in the following table:

Variable	Source
Gini Market Coefficient	The Standardized World Income Inequality Database
Public Debt	Bank for International Settlements (BIS)
GDP growth	The World Bank Data
Unemployment Rate	OECD Data
Female LFP	The World Bank Data
Trade Openness	The World Bank Data
Trade Union Density	OECD Data
Collective bargaining coverage	OECD Data

The first research hypothesis implies that $\beta>0$, while the second research hypothesis postulates that $\beta_{developing}>\beta_{advanced}$. These hypotheses are examined empirically in the next section.

4.2.1. Panel Estimation

The efficiency of econometric estimations is increased by panel data analysis. In addition to providing more variety, it permits the error variances and intercept to vary freely amongst

entities, more precision in deriving the model's parameters, reduced collinearity between independent variables, and increased degrees of freedom (Hsiao, 2003).

The random effects and fixed effects models are introduced in the panel data test. Due to its absence of time-invariant features, the fixed effect model is immune to bias (like race, language, religion, gender, culture, etc.), as it accounts for the individuals' time-invariant differences. The fixed effects model is shown in the equation below:

$$Y_{it} = \alpha_i + \beta_1 * X_{it} + u_{it}$$

Where, uit is the error term, uit = μit + vit,

The random effects model presupposes that variations occur randomly across entities and that these variations are uncorrelated with the independent variables that make up the model. One benefit of the random effect is that time-invariant factors, such as gender, are included. The random effects model is shown in the following equation:

$$Yit = \alpha + \beta Xit + uit + \varepsilon it$$

Where ε is within entity error and uit is between entity errors.

4.2.2. Hausman Test

Hausman (1978) created a statistical hypothesis test to help select between fixed effect and random effect models. The test compares the coefficient estimators and assesses the consistency between the two models. The random effects estimator is inconsistent while the fixed model is consistent if μit is correlated with the independent variables.

4.2.3. Fisher test

When using Fisher's test, the null hypothesis states that all of the panel's series are non-stationary, whereas the alternative states that there is at least one stationary series. There is no need for a balanced panel for this test.

4.2.4. Variance Inflation Factor

Regression analysis uses a variance inflation factor (VIF) to identify multicollinearity. The occurrence of multicollinearity, or correlation between variables in a model, might negatively impact the outcomes of your regression analysis. The variance inflation factor (VIF) calculates the extent to which multicollinearity in a model inflates the variance of a regression coefficient.

Variance inflation factors start at 1 and go higher. The VIF's numerical value indicates the proportion that each coefficient's variance is inflated in decimal form. A VIF of 1.9, for instance, indicates that the variance of a given coefficient is 90% more than what would be predicted in the absence of multicollinearity.

5. Results and Analysis

The empirical findings are presented in three parts: First, the background information on data trends and summary statistics is covered. The correlation analysis is covered in the second part, while the regression findings and accompanying analysis are presented in the third section.

5.1. Descriptive Analysis

The dependent variables are the two Gini coefficients (as measured between 0 and 100), one based on market income and the other based on after-tax income. The independent variable is the public debt ratio, while the control variables include the GDP growth rate, unemployment rate, female labour force participation rate, trade ratio, trade union density, and collective bargaining coverage.

Table 1. Summary Statistics for the Full Sample

Variable	Obs	Mean	Std.Dev.	Min	Max
Gini Market	469	47.114	4.761	30.6	55.5
Gini Disposable	469	31.808	6.173	22.3	53.2
Public Debt	469	62.979	37.609	4.6	208.5
GDP growth	469	2.444	2.661	-8.074	11.467
Unemployment	469	7.092	3.744	2.05	27.47
Female LFP	469	52.022	8.752	23.07	70.64
Trade	469	74.916	36.679	18.349	217.614
Trade Union Density	469	26.54	18.181	6.3	81
Collective Bargaining	469	50.159	33.02	.7	100

Source: Authors' calculations based on data from SWIID (Solt, 2016), Bank for International Settlements (BIS), World Development Indicators (World Bank), and OECD Data.

Table 1 displays the summary statistics for these factors. In particular, it shows that the average Gini market coefficient was 47.1 with a standard deviation of 4.8. In the case of the Gini disposable coefficient, the average was 31.8 and the standard deviation was 6.2. In addition, the Gini market coefficient ranged between 30.6 and 55.5 while the Gini disposable coefficient varied between 22.3 and 53.2. Hence, the lower ranges and values of the Gini disposable coefficient imply that government policies are effective in decreasing income inequality levels.

The average debt is 63% of GDP with a standard deviation of 37.6% according to the public debt variable in Table 1. The range illustrates the wide range of variance in the public debt variable, ranging from a minimum value of 4.6% to a maximum value of 208.5%. Examining the control variables, the average GDP growth is 2.4% with a standard deviation of 2.7%, while the average unemployment rate was 7.1% with a standard deviation of 8.8%. The data also reveal that the standard deviation of the female labour force participation rate is 8.8% with an average of 52%, while the average trade ratio was 74.9% of GDP with a standard deviation of 36.7%. Hence, these control variables display high levels of dispersion in the sample. These findings are expected given that the sample covers many decades and very different countries.

Finally, the table presents the summary statistics for the labour market institutions. Namely, the trade union density is 26.5% on average with an 18.2% standard deviation, while the average collective bargaining coverage is 50.2% with a standard deviation of 33%.

It would be instructive to examine the summary data for each country groupings independently as the research also focuses on the distinctions between developed and developing nations. In this regard, Table 2 shows the developed nations' summary data in the top and bottom panels, respectively.

Table 2. Summary Statistics for Developed and Developing Countries

Developed Countries	Obs	Mean	Std.Dev.	Min	Max
Gini Market	408	47.283	4.481	31.8	55.5
Gini Disposable	408	30.544	4.568	22.3	47.4
Public Debt	408	66.866	37.982	5.7	208.5
GDP growth	408	2.2	2.413	-8.074	11.467
Unemployment	408	7.095	3.723	2.12	27.47
Female LFP	408	53.543	7.452	30.24	70.64
Trade	408	77.535	37.742	18.349	217.614
Trade Union	408	28.256	18.644	6.9	81
Collective Bargaining	408	54.946	31.929	6.7	100
Developing Countries	**Obs**	**Mean**	**Std.Dev.**	**Min**	**Max**
Gini Market	61	45.984	6.255	30.6	55.2
Gini Disposable	61	40.262	8.491	24.7	53.2
Public Debt	61	36.979	21.37	4.6	97.5
GDP growth	61	4.077	3.551	-5.75	11.2
Unemployment	61	7.072	3.919	2.05	22.67
Female LFP	61	41.848	9.992	23.07	58.17
Trade	61	57.398	21.743	30.71	137.407
Trade Union	61	15.061	8.153	6.3	51.5
Collective Bargaining	61	18.139	19.776	.7	100

Source: Authors' calculations based on data from SWIID (Solt, 2016), Bank for International Settlements (BIS), World Development Indicators (World Bank), and OECD Data.

With a standard deviation of 4.5, the average Gini market coefficient for developed nations was 47.3 according to the top panel of Table 2. Regarding the Gini disposable coefficient, the average is 30.5 and the standard deviation is 4.6. In addition, the Gini market coefficient ranged between 31.8 and 55.5, while the Gini disposable coefficient varied between 22.3 and 47.4. Hence, the lower ranges and values of the Gini disposable coefficient imply that government policies are more effective in decreasing income inequality levels in the developed countries.

Regarding the developed countries, Table 1 shows that government policies decrease the inequality level by around 17 points (from 47.3 to 30.5) while the same decrease is around 15 points (from 47.1 to 31.8). The redistribution policies seem to be more effective in the developed countries. The public debt in Table 2 shows that the average debt is 66.9% of GDP in the developed countries with a standard deviation of 38%. Hence, the public debt levels are larger in the developed nations.

Concerning the control variables, the average GDP growth is 2.2% for developed nations with a standard deviation of 2.4% while the average unemployment rate is 7.1% with a standard deviation of 3.7%. Hence,

both the growth rate and unemployment rate, along with their volatilities are smaller in the developed countries. The data also reveal that the standard deviation of the female labour force participation rate is 7.5% with an average value of 53.5% while the average trade ratio is 77.5% of GDP with a standard deviation of 37.7%. Hence, developed countries are found to have higher female LFP and trade ratios compared to the full sample. Lastly, the table shows that the trade union density had an average value of 28.3% with a standard deviation of 18.6 % while the average collective bargaining coverage is 54.9% with a standard deviation of 31.9%. Hence, the developed countries have higher trade union density levels and broader coverage of collective bargaining.

Table 2 (lower panel) indicates that the average Gini market coefficient for developing nations is 46 with a corresponding standard deviation of 6.3. Regarding the Gini disposable coefficient, the average is 40.3 and the standard deviation is 8.5. In addition, the Gini market coefficient ranged between 30.6 and 55.2 while the Gini disposable coefficient varied between 24.7 and 53.2. While these numbers imply that the government policies are effective in decreasing the inequality levels in developing countries, this effect is weaker compared to the same effect in the developed countries. In the developing countries, government policies decrease the inequality level by around only 6 points (from 46 to 40.3) while the policies decrease it around 17 points (from 47.3 to 30.5) in the upper panel of Table 2 for developed countries. Therefore, the redistribution policies seem to be more effective in the case of developed countries.

The public debt variable in the lower panel of Table 2 shows that the average debt is 37% of GDP in the developing country sample with a standard deviation of 21.4%. Hence, the public debt levels are lower in the case of developing countries. Regarding the control variables, the average GDP growth is 4.1% for developing countries with a standard deviation of 3.6%. In addition, the average unemployment rate is 7.1% for developing countries with a standard deviation of 3.9%. Therefore, the growth rate in developing nations was higher.

Furthermore, the average trade ratio of 57.4% of GDP with a standard variation of 21.7% and the average value of 41.8% with a standard deviation of 10% for the female labour force participation rate are shown in the table's lower panel. Hence, developing countries are found to have lower female LFP and trade ratios compared to the developed country. Finally, the table shows that the trade union density in developing countries had an average value of 15.1% with a standard deviation of 8.2% while the average collective bargaining coverage is 18.1% with a standard deviation of 19.8%. Therefore, the developing country sample has lower trade union density levels and narrower coverage of collective bargaining.

Overall, the comparison of the summary statistics in Table 2 documents major similarities and differences in data properties such as similar inequality levels but lower public debt levels in developing countries. These differences are also presented in Figures 3 and 4. In return, it can be expected that these properties can be reflected in the empirical analysis in terms of different debt-inequality nexuses across country groups.

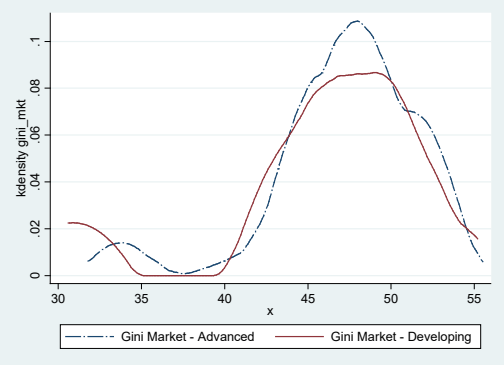

Figure 5. Kernel Density for Gini Market

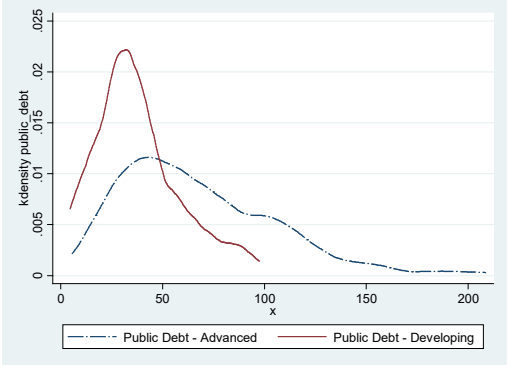

Figure 6. Kernel Density for Public Debt

Source: Based on author's calculations

5.2. Correlation Analysis

Once the dependent, independent, and control variables' statistics have been shown, this part conducts a simple correlation analysis among these variables. The Pearson correlation coefficients for both developed and developing nations are displayed in Table 3. It shows the existence of a positive and modest link between the Gini market coefficient and the Gini disposable coefficient. Furthermore, the association between the Gini market coefficient and the public debt variable is positive (with a correlation value of 0.345). Therefore, these data support the first hypothesis by showing a correlation between debt levels and the degrees of inequality.

Table 3 summarizes the relationships between the control variables and the Gini market coefficient. It shows that the growth rate is negatively correlated with the Gini market coefficient whereas the unemployment rate, female LFP, trade union density, and collective bargaining coverage are favorably correlated. In the case of the Gini disposable coefficient, Table 3 also shows that it has a negative (with a correlation coefficient of -0.121) correlation with the public debt. Therefore, this result contradicts the first hypothesis, which holds that there is a connection between greater debt levels and lower inequality levels. This puzzling result is similar to the case of Kalin (2018), who also finds different signs when the inequality measures are changed.

Furthermore, Table 3 summarizes the correlations between the Gini disposable coefficient and the control variables. It shows that the Gini disposable coefficient is negatively correlated with the trade ratio, female labour force participation rate, collective bargaining coverage, and growth rate, while it is positively correlated with the unemployment rate and the growth rate. Certain indications, including the ways that trade union density and collective bargaining coverage reduce inequality, are predicted, while some other signs are not as expected (such as the inequality-increasing effects of economic growth).

Table 4 repeats the same correlation analysis for the developed and developing nations individually. In particular, the upper panel of Table 4 shows that, for developed nations, there is a positive association (correlation size of 0.234) between the Gini market coefficient and the Gini disposable coefficient. In addition, the Gini market

Table 3. Pearson Correlation Coefficients for the Full Sample

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Gini Market	1.000							
(2) Gini Disposable	0.225*	1.000						
(3) Public Debt	0.345*	-0.121*	1.000					
(4) GDP Growth	-0.272*	0.145*	-0.347*	1.000				
(5) Unemployment	0.315*	0.098*	0.276*	-0.152*	1.000			
(6) Female LFP	0.105*	-0.364*	-0.147*	-0.119*	-0.295*	1.000		
(7) Trade	-0.024	-0.532*	-0.043	-0.013	-0.108*	0.087	1.000	
(8) Trade Union	0.138*	-0.532*	0.081	-0.176*	-0.015	0.312*	0.250*	1.000
(9) Collective_Barg.	0.221*	-0.590*	0.289*	-0.290*	0.252*	0.107*	0.347*	0.614*

* shows significance at the 0.05 level

Source: Authors' calculations based on data from SWIID (Solt, 2016), Bank for International Settlements (BIS), World Development Indicators (World Bank), and OECD Data.

coefficient is positively and moderately correlated with the public debt variable (correlation coefficient = 0.339). Therefore, this result supports the first hypothesis by showing that greater debt levels are linked to higher levels of inequality. Regarding the correlations with the control variables in the developed nations, Table 4's upper panel demonstrates that the growth rate is negatively correlated with the Gini market coefficient while the unemployment rate, trade union density, and collective bargaining coverage are positively correlated. In the case of the Gini disposable coefficient for developed countries, the upper panel of Table 4 shows that it has a positive, but statistically insignificant (with a correlation coefficient of 0.050) correlation with the public debt.

With a correlation value of 0.570, the lower panel of Table 4 illustrates how the Gini market coefficient and the Gini disposable coefficient correlate positively in the emerging nations. In addition, the Gini market coefficient is positive and moderate (with a correlation coefficient of 0.413) with the public debt. Therefore, this result supports the first hypothesis by showing that greater debt levels are linked to higher levels of inequality. In the case of the Gini disposable coefficient for developing countries, the lower panel of Table 4 indicates that it has again a negative but statistically insignificant correlation with the public debt.

Overall, these figures demonstrate that the relationship between debt and inequality varies between developed and developing nations. This positive association is also shown with scatter plots in Figures 7 and 8. Moreover, the debt-inequality correlation coefficient is larger in the developing countries, which supports the second research hypothesis. While correlation analysis provides some indicative evidence of the debt-inequality relationship, its bivariate nature (i.e., the lack of controlling for other relevant variables) becomes an important shortcoming. Hence, the following part conducts multivariate regression analyses to produce more robust findings.

Table 4. Pearson Correlation Coefficients for Developed and Developing Countries

Developed Countries	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Gini Market	1.000							
(2) Gini Disposable	0.234*	1.000						
(3) Public Debt	0.339*	0.050	1.000					
(4) GDP Growth	-0.205*	0.087	-0.322*	1.000				
(5) Unemployment	0.314*	0.164*	0.262*	-0.165*	1.000			
(6) Female LFP	0.048	-0.240*	-0.323*	0.008	-0.364*	1.000		
(7) Trade	-0.055	-0.569*	-0.109*	0.054	-0.106*	0.005	1.000	
(8) Trade Union	0.126*	-0.557*	0.003	-0.126*	-0.022	0.252*	0.211*	1.000
(9) Collective_Barg.	0.232*	-0.529*	0.197*	-0.245*	0.271*	-0.100*	0.306*	0.584*
Developing Countries	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
(1) Gini Market	1.000							
(2) Gini Disposable	0.570*	1.000						
(3) Public Debt	0.413*	-0.117	1.000					
(4) GDP Growth	-0.435*	-0.137	-0.275*	1.000				
(5) Unemployment	0.338*	-0.033	0.609*	-0.120	1.000			
(6) Female LFP	0.159	0.028	-0.306*	-0.090	-0.180	1.000		
(7) Trade	0.050	-0.542*	0.145	-0.128	-0.179	0.000	1.000	
(8) Trade Union	0.120	-0.443*	0.404*	-0.211	0.056	0.154	0.316*	1.000
(9) Collective_Barg.	0.031	-0.582*	0.480*	-0.139	0.303*	0.108	0.293*	0.552*

* shows significance at the 0.05 level

Source: Authors' calculations based on data from SWIID (Solt, 2016), Bank for International Settlements (BIS), World Development Indicators (World Bank), and OECD Data.

5.3. Regression Analysis

In this section, the multivariate regression analysis is carried out for the entire sample of countries in addition to the developed and developing country groups. Table 5 presents the regression model estimation using the panel data methods of fixed-effect regressions and the Gini market coefficient. The Hausman test is used to evaluate the decision between the random-effects model and the fixed-effects model (Wooldridge, 2010). Given that the relevant p-value is less than 0.05, the fixed-effects model is the recommended estimate method. The corresponding results show that the R^2 parameter is estimated as 0.421, thereby implying that the regression is 44.922 with a corresponding p-value of 0.000. Accordingly, these data suggest that the group of the independent variables, which includes the public debt variable, is jointly statistically significant at the 1% level. Hence, the R^2 and F-stat imply that the regression model has explanatory power for the Gini market coefficient.

Figure 7. Gini Market and Public Debt in Developed Countries

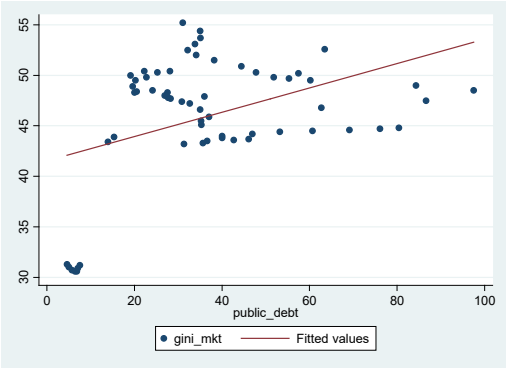

Figure 8. Gini Market and Public Debt in Developing Countries

Source: Based on author's calculations

One possible issue in the regression is multicollinearity, which arises in the case of very high correlation coefficients among the independent variables (Wooldridge, 2010). Following the regression findings, the Variance Inflation Factors (VIF) are computed in order to check for the existence of the multicollinearity problem. The results indicate that none of the VIF factors is above three; hence, the OLS results do not suffer from the multicollinearity problem. According to the Fisher test, the variables used in the regression model satisfy stationarity assumption.

Table 5. Fixed-Effects Regression Results of Gini Market Coefficient for the Full Sample

Gini Market	Coef.	St.Err.	t-value	p-value	Sig
GDP Growth	-0.025	0.022	-1.15	0.249	
Unemployment	0.149	0.026	5.79	0.000	***
Female LFP	0.100	0.021	4.83	0.000	***
Trade	0.004	0.005	0.72	0.473	
Public Debt	0.019	0.003	5.57	0.000	***
Trade Union	-0.124	0.018	-6.74	0.000	***
Collective Barg.	-0.003	0.009	-0.28	0.782	
Constant	42.840	1.471	29.13	0.000	***
Mean dependent var	47.114		SD dependent var		4.761
R-squared	0.421		Number of obs		469.000
F-test	44.922		Prob > F		0.000

*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' calculations based on data from SWIID (Solt, 2016), Bank for International Settlements (BIS), World Development Indicators (World Bank), and OECD Data.

Table 6. Fisher-type unit-root test based on Augmented Dickey-Fuller test (Developing Countries)

Variables	Lags	Chi-Squared	P-Value
Gini Market	0	83.8066	0.0000
Unemployment	0	81.1195	0.0000
GDP Growth	0	56.1403	0.0000
Female LFP	0	73.0401	0.0000
Trade Openness	0	43.8806	0.0001
Public Debt	0	19.3883	0.0356
Trade Union	0	108.7873	0.0000
Collective Barg.	0	36.3244	0.0009

Source: Authors' calculations based on data from SWIID (Solt, 2016), Bank for International Settlements (BIS), World Development Indicators (World Bank), and OECD Data.

Table 7. Fisher-type unit-root test based on Augmented Dickey-Fuller test (Developed Countries)

Variables	Lags	Chi-Squared	P-Value
Gini Market	0	68.2308	0.0001
Unemployment	0	85.6821	0.0000
GDP Growth	0	433.3368	0.0000
Female LFP	0	176.4464	0.0000
Trade Openness	0	242.5202	0.0000
Public Debt	0	97.1562	0.0000
Trade Union	0	209.7807	0.0000
Collective Barg.	0	337.4541	0.0000

Source: Authors' calculations based on data from SWIID (Solt, 2016), Bank for International Settlements (BIS), World Development Indicators (World Bank), and OECD Data.

Computed by the author using STATA. Ho: All panels contain unit roots, and the number of panels is 7; Ha: At least one panel is stationary, and the average period is 14.86.

Computed by the author using STATA. Ho: All panels contain unit roots, and the number of panels is 18; Ha: At least one panel is stationary, and the average period is 15.78.

When the statistically significant individual regression coefficients in Table 5 are examined, it is found that trade union density has a negative association with inequality, whereas the unemployment rate and female LFP have positive associations. These results are consistent with those found in previous research, such as Kus (2012), which found that greater rates of trade union density are associated with reduced inequality, whereas higher rates of unemployment and female labour force participation are associated with higher inequality. Table 5's upper panel presents the primary finding, indicating that the public debt regression coefficient is positive and statistically significant at the 1% level. A 1% increase in public debt is associated with a 0.019 point increase in

Table 8. Estimated VIF for Developing, and Developed Countries by the Methods of the Fixed and Random Individual Effects

	Developing Countries		Developed Countries	
Dependent variable	Gini Market			
	VIF	1/VIF	VIF	1/VIF
Predictors	Coef.	Coef.	Coef.	Coef.
GDP Growth	1.22	0.82	1.11	0.904
Unemployment	1.88	0.53	1.31	0.764
Female LFP	1.82	0.78	1.85	0.55
Trade Openness	1.75	0.57	1.26	0.79
Public Debt	1.70	0.59	1.47	0.68
Trade Union	1.63	0.61	1.67	0.598
Collective Barg.	1.18	0..85	1.16	0.86
Mean VIF	1.60		1.4	

Source: Authors' calculations based on data from SWIID (Solt, 2016), Bank for International Settlements (BIS), World Development Indicators (World Bank), and OECD Data.

Table 9. Estimated Model (1), (2) by the Methods of the Fixed and Random Individual Effects

	Developing Countries		Developed Countries	
Dependent variable	Gini Market			
	Fixed Effect	Random Effect	Fixed Effect	Random Effect
Predictors	Coef.	Coef.	Coef.	Coef.
GDP Growth	0.041	-0.293	-0.025	-0.040
Unemployment	-0.102	1.025***	0.173***	0.167***
Female LFP	-0.310***	0.062	0.141***	0.152***
Trade Openness	-0.064	0.562	0.013***	0.019***
Public Debt	0.017	0.059	0.014***	0.014***
Trade Union	-0.085	0.482**	-0.176***	-0.143***
Collective Barg.	-0.115*	-0.381*	0.014*	0.015*
Constant	65.892***	29.226***	40.811***	39.676***
Obs.	104	104	365	365
Prob.> F	0.000	0.000	0.000	0.0333
R-Squared	0.569	0.403	0.579	0.575
Hausman Test				
chi2(7)	14.502		chi2(7) = 17.581	
Prob.>chi2	0.043		0.014	

Source: Authors' calculations. ***: sig at 1% level, **: sig at 5% level, and *: sig at 10% level

the Gini market coefficient, according to the regression coefficient. The initial study hypothesis—which holds that greater levels of public debt are linked to higher levels of inequality—is strongly supported by these results. This finding also extends the existing literature, such as Salti (2015) and Karlin (2018), by providing evidence based on a broader sample and more robust results.

The second research hypothesis postulates that debt-inequality sensitivity can be higher in developing countries due to various structural differences between developed and developing countries. To verify this hypothesis, Table 9 reproduces the fixed-effects regression model for the developing and developed country subsamples in the lower and top panels, respectively. The main focus is on the difference in the regression coefficients for the public debt variable. Table 9 shows that the relevant regression coefficient is estimated as 0.014 in the case of developed countries and 0.017 in the case of developing countries. The regression coefficient is significant at the 1% level for the developed countries but not significant at the 10% level for developing countries. So, the direct comparison of the regression coefficients implies that the inequality-increasing impact of public debt is stronger in the case of developing countries. However, this comparison is not robust as the statistical significance level is not sufficient for the second country group. Hence, it can be argued that the empirical evidence for the second research hypothesis is relatively limited.

The results for developed nations are similar to the full-sample results when comparing Tables 5 and 9, while the results for developing nations differ significantly. This can be explained by the fact that 87% of the observations used in this study are from developed countries, while the percentage of observations from developing countries is limited to 13% of the total observations. This is because developing nations have historically limited access to data, which might seriously affect the outcomes seen in Table 9's lower half. Specifically, the FLFP rate and collective bargaining have a favorable impact on income disparity in developed countries, as Table (9) demonstrates. Inequality is increased because, as the theoretical framework states, unions protect middle-class and higher-paid workers while leaving lower-paid workers unorganized. As women typically work in lower-paying industries like healthcare facilities and maternal education, while males are more likely to have high-paying positions, the FLFP has a positive impact on inequality.

6. Conclusions

The present study postulates that higher public debt would be associated with higher inequality levels. While debt financing serves the interests of those who can afford to lend to the government, one potential vehicle for financing public debt is taxes imposed on the entire people. Therefore, because it may suggest money transfers from the poor to the rich, governmental debt may be regressive. In addition, higher public debt levels can squeeze fiscal space through higher payment burdens, thereby decreasing the ability of governments to address inequality issues. In order to test this possible inequality-increasing effect of public debt, the study conducts detailed pooled OLS and fixed-effects regression estimations. The results provide robust indication of the positive association between public debt and inequality, i.e., higher public debt levels lead to higher inequality levels.

The additional outcomes indicate that the corresponding sensitivity parameter is larger

in the case of developing countries; however, the corresponding evidence is not strong, which pave the way for context-oriented studies to investigate the factors that control this sensitivity.

The results of this research can have important policy implications. Related to the research topic, evidence of the inequality-increasing effects of public debt implies that governments can use debt as a policy tool to address inequality. Namely, the persistently rising or high levels of public debt in recent periods in many countries can be harmful to economic equality. Hence, governments can decrease public debt levels in order to improve income distribution by imposing an exceptional tax on private capital as "the most just and efficient solution" (Piketty, 2014). Moreover, the regression outcomes display that labour market institutions such as trade unions and collective bargaining can be helpful to decrease inequality. Then, governments can implement measures that would increase the bargaining power of workers relative to large corporations in order to improve income equality. Overall, the study adds to the pertinent body of research by providing thorough and convincing data about the effect of public debt on inequality in both developed and developing nations.

References

Acemoglu, D. (2002). Technology and inequality. *NBER Reporter Online*, (Winter 2002/03), 12-16.

Alvaredo, F. (2011). A note on the relationship between top income shares and the Gini coefficient. *Economics Letters*, *110*(3), 274-277.

Aghion, P., & Howitt, P. (1998). *Endogenous growth theory*. MIT Press.

Armour, P., Burkhauser, R. V., & Larrimore, J. (2013). Deconstructing income and income inequality measures: a crosswalk from market income to comprehensive income. *American Economic Review*, *103*(3), 173-77.

Azzimonti, M., De Francisco, E., & Quadrini, V. (2014). Financial globalization, inequality, and the rising public debt. *American Economic Review*, *104*(8), 2267-2302.

Bahmani-Oskooee, M., Hegerty, S. W., & Wilmeth, H. (2008). Short-run and long-run determinants of income inequality: evidence from 16 countries. *Journal of Post Keynesian Economics*, *30*(3), 463-484.

Ball, L. (2014). Long-term damage from the Great Recession in OECD countries. *European Journal of Economics and Economic Policies, 11*(2), 149-160.

Bandara, A. (2015). The Economic Cost of Gender Gaps iin Effecrive Labor: Africa's Missing Growth Reserve. Feminist Economics, 21(2), 162-186.

Barro, R. J. (2003). Determinants of economic growth in a panel of countries. *Annals of economics and finance*, *4*, 231-274.

Bastia, T. (2013). Migration and inequality: an introduction. In *Migration and inequality* (pp. 19-39). Routledge.

BIS (2022). Credit to the non-financial sector. Available at: https://www.bis.org/statistics/totcredit.htm (Accessed 02 September 2022).

Blanchard, O. (2019). Public debt and low interest rates. *American Economic Review, 109*(4), 1197–1229.

Blau, F. D., & Kahn, L. M. (2017). The Gender Wage Gap: Extent, Trends, and

Explanations. *Journal of Economic Literature, 55*(3), 789-865.

Card, D. (2001). The Effect of Unions on Wage Inequality in the US Labor Market. *Industrial and Labor Relations Review, 54*(2), 296-315.

Cecchetti, S. G., Mohanty, M. S., & Zampolli, F. (2011). The real effects of debt. *Bank for International Settlements Working Paper No. 352*.

Chancel, L., Piketty, T., Saez, E., & Zucman, G. (2021). World inequality report 2022. Available at: https://wir2022.wid.world/ (Accessed 02 September 2022).

Dabla-Norris, M. E., Kochhar, M. K., Suphaphiphat, M. N., Ricka, M. F., & Tsounta, M. E. (2015). *Causes and consequences of income inequality: A global perspective*. International Monetary Fund.

David, H., Manning, A., & Smith, C. L. (2016). The contribution of the minimum wage to US wage inequality over three decades: a reassessment. *American Economic Journal: Applied Economics*, *8*(1), 58-99.

De Maio, F. G. (2007). Income inequality measures. *Journal of Epidemiology & Community Health*, *61*(10), 849-852.

DeLong, J. B., & Summers, L. H. (2012). Fiscal policy in a depressed economy. *Brookings Papers on Economic Activity, 2012*(1), 233-297.

Dinardo, J., & Lemieux, T. (1997). Diverging Wage Inequality Trends. *American Economic Review, 87*(2), 309-314.

Esping-Andersen, G. (2007). Sociological Explanations of Changing Income Distributions. *American Behavioral Scientist* 50:639.

Furceri, D., & Ostry, J. D. (2019). Robust determinants of income inequality. *Oxford Review of Economic Policy*, *35*(3), 490-517.

Goldin, C. (2014). A Grand Gender Convergence: Its Last Chapter. *American Economic Review, 104*(4), 1091-1119.

Goos, M., Manning, A., & Salomons, A. (2009). Job polarization in Europe. *American Economic Review*, *99*(2), 58-63.

Goos, M., Manning, A., & Salomons, A. (2014). Explaining job polarization: Routine-biased technological change and offshoring. *American Economic Review*, *104*(8), 2509-26.

Greenwood, J., Guner, N., Kocharkov, G., & Santos, C. (2014). Marry Your Like: Assortative Mating and Income Inequality. *American Economic Review, 104*(5), 348-353.

Grossman, G. M., & Helpman, E. (2018). Growth, trade, and inequality. *Econometrica*, *86*(1), 37-83.

Harrison, A., McLaren, J., & McMillan, M. (2011). Recent perspectives on trade and inequality. *Annu. Rev. Econ.*, *3*(1), 261-289.

Harvey, D. (2007). *A brief history of neoliberalism*. Oxford University Press, USA.

Heathcote, J., Perri, F., & Violante, G. L. (2010). Unequal we stand: An empirical analysis of economic inequality in the United States, 1967–2006. *Review of Economic Dynamics, 13*(1), 15-51.

Helpman, E., Itskhoki, O., Muendler, M. A., & Redding, S. J. (2017). Trade and inequality: From theory to estimation. *The Review of Economic Studies*, *84*(1), 357-405.

Iacoviello, M. (2008). Household debt and income inequality, 1963–2003. *Journal of*

Money, Credit and Banking, *40*(5), 929-965.

Jenkins, S. (2017). The measurement of income inequality. In *Economic inequality and poverty* (pp. 3-38). Routledge.

Karlin, P. (2018). *Income inequality in OECD countries with increasing public debt and varying economic performance.* MS Thesis, Faculty of Business Studies, University of Vaasa, Finland.

Krugman, P., Obstfeld, M., & Melitz, M. (2017). *International Economics: Theory and Policy*. Pearson.

Kus, B. (2012). Financialisation and income inequality in OECD nations: 1995-2007. *The Economic and Social Review*, *43*(4, Winter), 477-495.

Lin, K. H., & Tomaskovic-Devey, D. (2013). Financialization and US income inequality, 1970–2008. *American Journal of Sociology*, *118*(5), 1284-1329.

Mdingi, K. and Ho, S.-Y. (2021). Literature review on income inequality and economic growth. MethodsX, 8. https://doi.org/10.1016/j.mex.2021.101402.

Milanovic, B. (1997). A simple way to calculate the Gini coefficient, and some implications. *Economics Letters*, *56*(1), 45-49.

Milanovic, B. (2016). *Global inequality: A new approach for the age of globalization*. Harvard University Press.

Neckerman, K. M., & Torche, F. (2007). Inequality: Causes and consequences. *Annu. Rev. Sociol.*, *33*, 335-357.

Nickell, S. (1997). Unemployment and labor market rigidities: Europe versus North America. *Journal of Economic Perspectives, 11*(3), 55-74.

OECD (2022). Trade Unions and Collective Bargaining. Available at: https://stats.oecd.org/Index.aspx?DataSetCode=TUD (Accessed 02 September 2022).

Okeke, A., & Alexiou, C. (2025). Public debt and income inequality in times of austerity: Dynamic panel evidence. *Forum for Social Economics*, 1–23. https://doi.org/10.1080/07360932.2025.2464599

Ostry, J. D., Berg, A., & Tsangarides, C. G. (2014). Redistribution, inequality, and growth. *IMF Staff Discussion Note No. 14/02*.

Perotti, R. (1996). Growth, income distribution, and democracy: What the data say. *Journal of Economic Growth, 1*(2), 149-187.

Piketty, T. (2014). *Capital in the Twenty-First Century*. Harvard University Press.

Piketty, T. (2015). *The economics of inequality*. Harvard University Press.

Piketty, T., & Cantante, F. (2018). Wealth, taxation and inequality. In *Reducing inequalities* (pp. 225-239). Palgrave Macmillan, Cham.

Salti, N. (2015). Income inequality and the composition of public debt. *Journal of Economic Studies*, *42*(5), 821-837.

Stiglitz, J. E. (2012). *The price of inequality: How today's divided society endangers our future*. W.W. Norton & Company.

Stolper, W. F., & Samuelson, P. A. (1941). Protection and Real Wages. The Review of Economic Studies, 9(1), 58–73.

Solt, F. (2016). The standardized world income inequality database. *Social science quarterly*, *97*(5), 1267-1281.

Tridico, P. (2018). The determinants of income inequality in OECD countries. *Cambridge Journal of Economics*, *42*(4), 1009-1042.

UNDP (2022). Human Development Data. Available at: https://hdr.undp.org/data-center (Accessed 22 September 2022).

Woo, J. (2003). Economic, political, and institutional determinants of public deficits. *Journal of Public Economics, 87*(3-4), 387-426.

Woo, J., & Kumar, M. S. (2015). Public debt and growth. *Economica*, *82*(328), 705-739.

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. MIT Press.

World Bank (2022). World Development Indicators. Available at: https://databank.worldbank.org/source/world-development-indicators (Accessed 02 September 2022).

World Bank (2022b*). International Debt Report 2022*: Updated International Debt Statistics. Washington, DC: World Bank.

World Inequality Database (2022). Gini Index of National Income. Available at: https://wid.world/ (Accessed 02 September 2022).