Do fiscal rules influence income inequality? Evidence from advanced and emerging economies

Luca Klein
*lklein@cedeplar.ufmg.br

Rafael S. M. Ribeiro
†rsmribeiro@cedeplar.ufmg.br

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Abstract

Income inequality is a pertinent subject of study due to its manifold implications for economies. Fiscal rules represent a restriction on fiscal policy, a crucial tool for addressing income inequality. The widespread implementation of fiscal rules has coincided with changes in the dynamics of income inequality in recent decades. This study aims to investigate the differential impacts of the implementation of four types of fiscal rules (Debt, Budget Balance, Expenditures, and Revenues) on income inequality in both advanced and emerging economies. Through empirical analysis using the Local Projections method for the period from 1995 to 2019, this article finds that all four types of fiscal rules contributed to an increase in income inequality in advanced economies. However, in emerging economies, only Budget Balance Rules have favored the mitigation of income inequality, while Debt, Expenditure and Revenue rules have had neutral effects.
Keywords: *Income Inequality; Fiscal Rules; Advanced Economies; Emerging Economies.*

Área: Economia

1 Introduction

Income inequality, defined as the unequal distribution of income among individuals or households within a society, is a pertinent subject of study due to its far-reaching implications on various economic aspects, including growth, productivity and stability (Chancel et al., 2022)). In recent decades, a noticeable rise in income inequality has been observed globally, particularly pronounced in advanced economies since the 1980s, with subsequent manifestations in emerging economies (Chancel et al., 2022)). This shift in dynamics can be attributed to several factors, including but not limited to globalization, technological changes and institutional reforms (M. D. Coady & Gupta, 2012). It is noteworthy that alongside the increase in Income inequality, there has been a growing trend of public support for income redistribution measures aimed at mitigating this disparity (Fund, 2014).

When addressing income distribution, fiscal policy emerges as one of the most effective tools to combat inequality. However, the redistributive function of fiscal policy has been weakening in some countries (M. D. Coady & Gupta, 2012). Since the 1990s, Fiscal Rules have been widely adopted in both advanced and emerging markets (Lledó, Yoon, Fang, Mbaye, & Kim, 2017). Essentially, a Fiscal Rule can be defined as a restriction on the use of fiscal policy aimed at promoting sustainability, transparency and signaling of public accounts (Eyraud et al., 2018).

While fiscal rules have been successful in achieving fiscal balance in numerous nations (Bova, Carcenac, & Guerguil, 2014; Dahan & Strawczynski, 2013; Fabrizio & Mody, 2006;

*Department of Economics, Universidade Federal de Minas Gerais, Brazil
†Department of Economics, Universidade Federal de Minas Gerais, Brazil

Hallerberg, Strauch, & von Hagen, 2009; Neyapti, 2013), their potential side effects remain relatively underexplored in the literature (Bova et al., 2014; Combes, Minea, Vinturis, & Sawadogo, 2019; Dahan & Strawczynski, 2013; Hartwig & Sturm, 2019; Jung & Kim, 2021; Ulloa-Suárez, 2021). Consequently, this paper aims to address three key gaps in the existing literature regarding Income inequality and Fiscal Rules.

Firstly, it extends the analysis to both advanced and emerging countries, unlike previous studies that often focused on isolated groups such as the Eurozone, the OECD, or Latin America. As noted by previous authors, understanding how structural factors influence both the design of Fiscal Rules and the dynamics of inequality is crucial. Secondly, this study pioneers the application of Local Projections, a method previously unexplored in this literature. Traditional approaches have concentrated on Synthetic Control, Fixed Effects Panel and Propensity Score methodologies. Lastly, the paper examines the effects of Revenue Fiscal Rules, a type of rule that has not been unexplored in previous studies. By addressing these gaps, this paper contributes to a deeper understanding of the relationship between Fiscal Rules and Income inequality.

This study is organized into four separate sections. The first section presents a review of the literature on Income inequality and Fiscal Rules. The second section details the database, particular cases of some countries and the methodology used. Then, the third section thoroughly analyzes the model results. Finally, the fourth section presents the conclusions obtained. It is worth mentioning that the Appendix contains surveys of empirical work on the determinants of Income inequality and the relationship between Fiscal Rules and Income inequality, together with tables containing the results of the models.

2 Literature review

2.1 Income Inequality

inequality is a multidimensional concept appearing in the form of wealth, opportunities, life expectancy, income, gender disparities and among others (Aaberge & Brandolini, 2015). The focus of this study is on Income inequality (II), which pertains to the distribution of individual or household earnings within a population at a given time, reflecting the disparities in income distribution among individuals (Fund, 2014).

On a global scale, II has exhibited a gradual decline over history when considering the world average. However, over the past four decades, II has surged in numerous countries and regions, albeit with variations (Chancel et al., 2022). Notably, during the 20th century, income disparities between nations were more pronounced. Presently, these inter-country disparities have somewhat diminished, depending on the regions under analysis. However, there has been a discernible rise in intra-country inequality. M. D. Coady and Gupta (2012) attribute this trend to several factors. Globalization, for instance, exerts downward pressure on the wages of low-skilled workers, who constitute a larger share of the workforce, while benefiting more highly skilled labor. Additionally, technological advancements have disproportionately favored highly skilled workers. Furthermore, various institutional and

regulatory reforms have fostered a more competitive market environment, diminishing workers' bargaining power. These dynamics initially impacted II in advanced countries during the 1980s and later extended their influence to emerging economies.

The Gini Index is the most commonly used measure of II, ranging from 0 (indicating complete equality) to 1 (indicating complete inequality). An analysis of this indicator reveals that between 1990 and 2010, European economies experienced an increase in II, particularly pronounced between 1990 and 1995, especially in emerging countries within Europe. Similar trends were observed in regions such as Asia, the Pacific, the Middle East and North Africa. Although average inequality in Sub-Saharan Africa decreased during this period, more than a quarter of economies in this region still saw an increase of more than 3 percentage points in II. In Latin America, over a third of economies experienced an increase in II, although there was a slight reduction on average. However, from 2000 onwards, most countries in Latin America began to record a significant decrease in the Gini Index. Interestingly, the global increase in II coincided with a widespread rise in public support for income redistribution, as noted by the Fund (2014).

II is a crucial topic for study due to its influence across various economic channels. Firstly, it is essential to highlight the negative relationship between II and aggregate demand, which is influenced by income concentration (R. J. Barro, 2000; Jha, 1996). Additionally, II can limit access to credit for low-income individuals, thereby constraining their productive potential due to failures in credit and investment markets, which hampers growth(Aghion & Bolton, 1997; Banerjee & Newman, 1993; Bertola, 2000; Galor & Zeira, 1993; Loury, 1981; Piketty, 1997). Moreover, II can lead to political instability, resulting in inefficiencies in investment levels (A. F. Alesina & Perotti, 1996). Lastly, II can impact economic efficiency, fostering rent-seeking activities. High II encourages an inefficient allocation of resources, discouraging investment and hindering economic growth (Rodrik, 1997).

Considering the economic implications surrounding II, it is crucial to understand the factors that influence its dynamics. The literature emphasizes several determinant factors for II. Firstly, education emerges as a crucial instrument in combating II in the medium term (D. Coady & Dizioli, 2018). Education can play a pivotal role in various ways. For instance, it can stimulate a more robust economic growth process, as suggested by R. Barro (2013) and Hanushek and Wobmann (2010), or it can disrupt the inter generational transmission of poverty and asymmetry of opportunities, as observed by Corak (2013).

Secondly, the income generation process is considered a significant vector, addressed in various perspectives in the literature. Jha (1996), a pioneer in this discussion, highlighted a nonlinear relationship between economic growth and the Gini Index: initially, economic growth might increase the Gini Index due to income concentration, but later, this relationship could reverse due to factors such as a progressive tax system. On the other hand, the institutional approach suggests that strong institutions promote more balance and distributive growth (Daron & Robinson, 2012; Rodrik, 2000; Stiglitz, 2016).

Globalization has demonstrated significant effects on II since the 1990s, with various studies shedding new light on this relationship Dorn, Fuest, and Potrafke (2018). According

to Feenstra and Hanson (1996, 1999), outsourcing low-skilled tasks in advanced economies can negatively impact less skilled workers in these countries. However, within the global value chain, these activities can stimulate demand for higher skills in emerging countries. Thus, heterogeneity between firms within the same sector and wage differentials between firms involved in international trade can contribute to an increase in II. More productive companies tend to offer higher wages to skilled workers, thereby widening the wage gap between workers from different companies (Egger, Egger, & Kreickemeier, 2013; Egger & Kreickemeier, 2009; Frias, Kaplan, & Verhogen, 2012; Manasse & Turrini, 2001; Munch & Skaksen, 2008; Sampson, 2014; Verhoog, 2008; Yeaple, 2005).

When addressing income distribution, fiscal policy emerges as the essential tool Fund (2017). On the one hand, studies emphasize that a more progressive tax system has more consistent effects in alleviating II, as shown by Woo, Bova, Kinda, and Zhang (2017). Specifically, direct taxes are more effective in income redistribution, while indirect taxes tend to increase II (Cubero & Hollar, 2010; Gemmell & Morrissey, 2005; Martinez-Vazquez, Moreno-Dodson, & Vulovic, 2012). On the other hand, research highlights that public spending in the form of social benefits is more distributive than taxes (Chu, Davoodi, & Gupta, 2012; Doumbia & Kinda, 2019; Joumard, Pisu, & Bloch, 2012; Martinez-Vazquez et al., 2012; Paulus et al., 2009).

M. D. Coady and Gupta (2012) suggest that the redistributive function of fiscal policy in advanced countries was notably efficient, with a reduction in II observed in 25 OECD countries between 1985 and 2005. The authors found that expenditure-focused fiscal policies had a distributive effect twice as large as tax-focused policies. However, starting from the 1990s, the redistributive effects of fiscal policy weakened in these countries.

In contrast, in emerging countries, the effectiveness of fiscal policy in reducing II is more limited due to lower levels of taxes and transfers. Research by Goñi, López, and Servén (2008) indicates that by the mid-2000s, the tax and transfer system in six Latin American economies managed to decrease the average Gini Index by only about 2 percentage points, from 0.52 to 0.50. Similar results were reported by Lustig et al. (2011). This decrease stands in stark contrast to the situation in 15 European economies, where inequality dropped by approximately 20 percentage points, from 0.46 to 0.27. As a result, nearly three-quarters of the difference in Gini indices between Latin American and European countries, corresponding to 18 of the 23 points of difference, can be attributed to disparities in fiscal policy approaches.

After introducing the discussion on II, this study aims to understand how the implementation of Fiscal Rules can affect the dynamics of this variable. Recent literature has emphasized the success of incorporating rules in promoting fiscal sustainability, but there is still a lack of investigation into their effects on socioeconomic variables Bonasia et al. (2020); Dahan and Strawczynski (2013); Hartwig and Sturm (2019).

In this context, it is important to consider that each country's structural factors may result in different effects for each Fiscal Rules, such as in emerging and advanced economies. In other words, the process of economic and redistributive growth, along with each country's fiscal situation, may lead to different interpretations of the impacts of fiscal constraints. For

example, one rule may lead to a reduction in II in one country and an increase in another.

This study aims to fill a gap in the literature by investigating how Fiscal Rules affect II in emerging and advanced economies. This is especially relevant since previous studies on this topic have focused on analyzing groups of economies that share similar characteristics, such as the Eurozone, the OECD and Latin America.

2.2 Fiscal Rules

Fiscal Rules (FR) can be defined as constraints on the use of fiscal policy, aimed at promoting fiscal sustainability, transparency and signaling of the conduct of public accounts (Eyraud et al., 2018). Essentially, FR are designed to contain excessive government debt.

This practice is grounded in three key principles. Firstly, as A. Alesina and Tabellini (1990) explain, FR serves as a commitment device, acting as a restraint on fiscal discretion. Secondly, Debrun and Kumar (2007) emphasize the role of FR in reducing informational asymmetry in economic policy, functioning as a signaling instrument. Finally, as observed by Eyraud et al. (2018), FR also possesses a political dimension, facilitating coordination and coalition-building among political parties.

Well-designed FR plays a crucial role in preserving fiscal space to promote policies of interest, contributing to economic stabilization, balance growth and inclusive social policies. Blanchard, Dell'Ariccia, and Mauro (2010) and Delong and Summers (2012) emphasize that better-shaped FR enhances the performance of automatic stabilizers, mechanisms that act during economic fluctuations without government intervention. Consequently, the fiscal space generated can help alleviate II or enhance the efficiency of countercyclical fiscal policies. The increased maneuvering room provided by well-designed FR favors stimulating aggregate demand without compromising fiscal sustainability.

Conversely, poorly designed FR can incur costs (Eyraud et al., 2018). For instance, limits on nominal deficits can lead to pro-cyclical dynamics, where spending cuts or tax increases occur during economic slowdowns and vice versa. Certain FR may also be inconsistent and generate composition bias, as demonstrated by Peletier, Dur, and Swank (1999), resulting in misallocated spending hindering the fight against II. Additionally, FR introduced without proper political adherence can lead to cases of creative accounting, reducing the transparency of fiscal policy (Milesi-Ferretti, 2003).

FR can have different properties and objectives. Among the various specifications of FR, this study relies on the IMF dataset (Schachter et al., 2012), focusing specifically on rules related to restrictions on budget aggregates Kumar et al. (2009). Therefore, the research only encompasses four types of rules:

- **Debt Rule:** The establishment of a limit or target for public debt, expressed as a ratio of Gross Domestic Product (GDP), is a common practice aimed at ensuring fiscal discipline and promoting convergence to a specific level of indebtedness, with ease of communication and monitoring.

  However, this rule is not without its limitations. One notable limitation is the lagged effects that budgetary measures may have on debt, making it challenging to implement

short-term and stabilization policies. This can result in pro-cyclical dynamics, where fiscal policy exacerbates economic fluctuations rather than mitigating them.

Additionally, adhering strictly to a debt rule may complicate the response to monetary shocks, as adjustments to fiscal policy may need to be larger than expected to maintain compliance with the debt target. This can introduce additional volatility into the economy and hinder efforts to stabilize economic conditions.

Furthermore, when the level of indebtedness is below the maximum limit established by the rule, it may offer little guidance on fiscal policy decisions. In such cases, policymakers may lack clear direction on whether to pursue further debt reduction or to reallocate resources towards other policy objectives.

Overall, while Debt Rule can provide a useful framework for fiscal discipline, policymakers must be mindful of these limitations and consider them when designing and implementing fiscal policy. Balancing the need for debt sustainability with the flexibility to respond effectively to economic shocks is essential for achieving macroeconomic stability and promoting long-term economic growth.

- **Budget Balance Rules:** These rules may encompass general balance, structural balance, cyclically adjusted balance and "above the cycle" balance, aiming to ensure that the debt-to-GDP ratio converges to a finite level. Among these, the cyclically adjusted balance rule is the most sensitive to political decisions.

  Favorable characteristics of these rules include their ability to ensure debt sustainability with clear objectives, as well as ease of communication and monitoring. However, they are not without limitations, which vary depending on their specific design.

  Rules focused on cyclically adjusted balance may be complex to calculate, making communication difficult. Conversely, the "above the cycle" balance rule may weaken corrective measures. Additionally, some designs may not incorporate economic stabilization characteristics, leading to pro-cyclical dynamics.

  Lastly, the Golden Rule, a peculiarity of this type of control, stipulates that capital expenditures are not restricted. However, this characteristic is not directly related to debt sustainability.

  In summary, while these rules offer advantages in ensuring fiscal discipline and debt sustainability, policymakers must carefully consider their design and implementation to mitigate potential limitations and avoid unintended consequences.

- **Expenditure Rules:** These types of rules establish limits for total public spending, primary spending (excluding debt interest payments), or current spending (regular government expenses). These limits are typically defined in various ways, including absolute values, growth rates, or as a percentage of GDP and typically extend over three to five years.

  It's important to note that these rules do not primarily aim to ensure the sustainability of public debt and do not restrict government revenue collection. However, they can

complement rules that directly address public debt or budget balance. They serve as an operational tool to encourage fiscal consolidation, controlling the budget consistently with sustainability when used alongside other rules.

Additionally, expenditure rules can prevent excessive spending during periods of unexpected economic growth when government revenues are temporarily high and meeting budget deficit limits is easy. However, they may not be suitable for allowing automatic fiscal responses to adverse economic shocks, as they do not require automatic adjustments of fiscal revenues in times of recession. Certain categories of spending, such as those aimed at unemployment support, may exhibit greater counter-cyclicality, which can increase the gap from sustainability targets.

In summary, these rules set limits for government spending and are relatively easy to communicate and monitor. However, they are not sufficient on their own to ensure the sustainability of public finances and are not compatible with discretionary fiscal stimulus. To ensure sustainability and economic stability, they generally need to be combined with other rules and fiscal policies.

- **Revenue Rules:** These rules are guidelines that establish maximum or minimum limits for government revenues, aiming to increase revenue collection or avoid excessive taxation. However, most of these rules are not directly related to controlling public debt since they do not limit government spending.

  Setting limits on revenues can be challenging, as revenue collection can vary considerably due to economic fluctuations, following the business cycle. An exception is rules that prohibit the use of "unexpected" revenues for additional expenses, helping prevent the government from spending unplanned money.

  On their own, revenue rules can contribute to pro-cyclical fiscal policies. Minimum limits often do not consider how revenues may automatically decrease in a recession or how they may grow beyond maximum limits during an economic recovery.

  However, like expenditure rules, revenue rules can be used to directly target the size of government, meaning they can be used to control the level of government activities. This aspect provides policymakers with a tool to manage the overall scope and scale of government operations.

Advanced economies led the way in adopting FR in the 1990s, with several emerging economies following suit from the 2000s onwards. By the end of 2021, 105 countries had incorporated at least one FR into their fiscal regimes, either at the national or supranational level. The impetus for advanced economies to implement FR came primarily from the Maastricht Treaty of 1992, which mandated members of the European Economic and Monetary Union to adopt measures to achieve debt and public deficit targets (Davoodi et al., 2022).

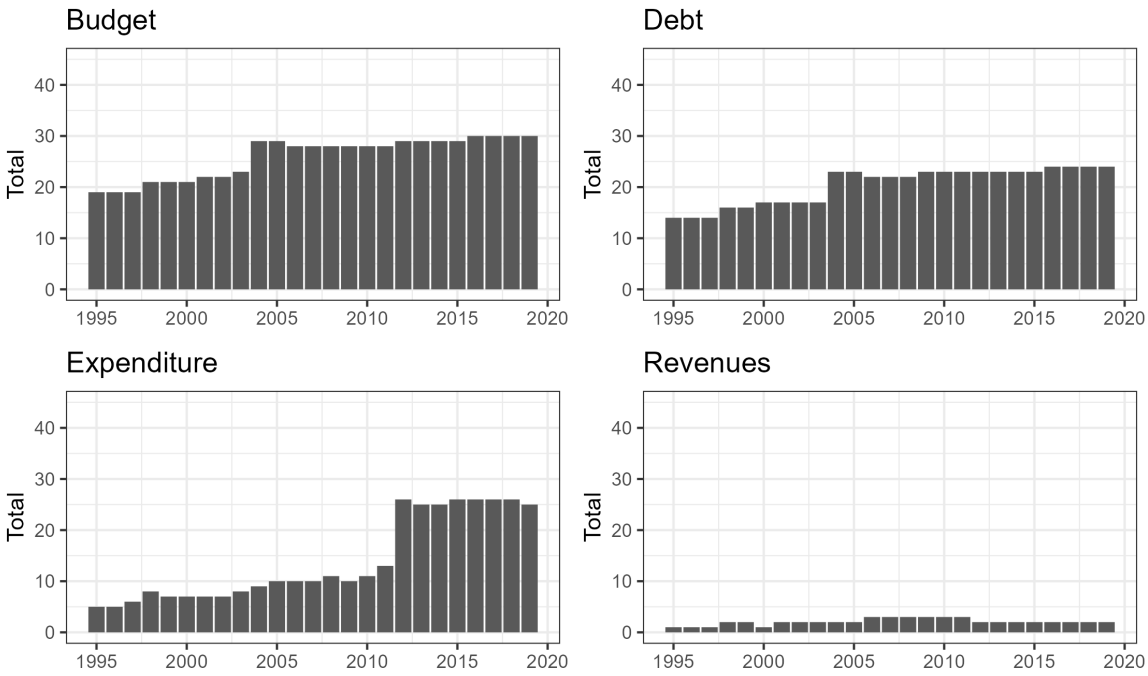
During the early 2000s, emerging countries began implementing national FR, while low-income economies adopted supranational FR. Among emerging countries, some implemented

FR to make fiscal adjustments after crisis periods, such as Brazil and Colombia. Others, like Mexico and Poland, aimed to achieve gains from fiscal reforms. Additionally, countries like Chile, Russia and Mongolia utilized FR to mitigate larger pro-cyclical spending amidst fluctuations in natural resource prices.

The prevalence of FR increased over time, with the average number of FR per nation rising from 2 in the early 2000s to 3. This trend towards multiple constraints was primarily driven by the desire to promote greater fiscal discipline, as observed by Davoodi et al. (2022) and Schachter et al. (2012). Analysis of FR dynamics reveals that Debt Rule were commonly combined with Budget Balance Rules. Subsequently, many countries introduced Expenditure Rules, while Revenue Rules were less adopted, partly due to governments having less control over revenue.

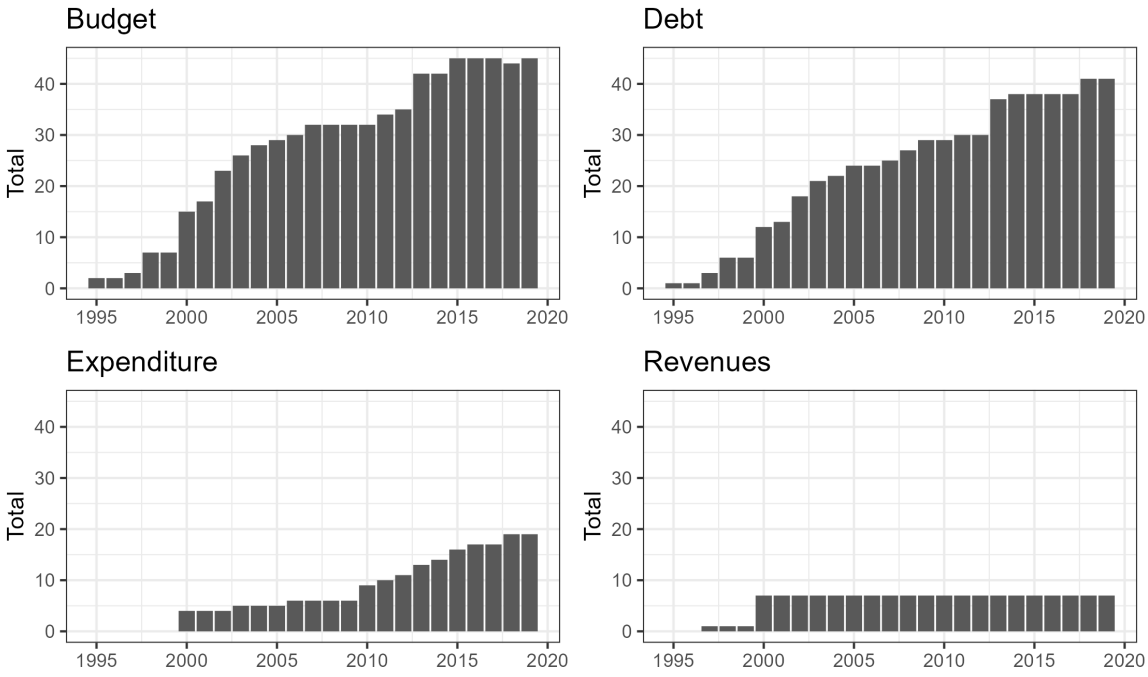
As of 2021, the adoption of Expenditure Rules prevails, with advanced economies leading the way. Approximately 75% of advanced economies have instituted this type of rule. However, less than half of emerging and developing economies have adopted this type of restriction. This reflects, in part, the need to increase spending in response to revenue growth, according to the findings of the same authors.

Figure 1: Distribution of FR in Advanced Economies



Source: Own elaboration with data from Schaechter et al. (2012).

Figure 2: Distribution of FR in Emerging Economies



Source: Own elaboration with data from Schaechter et al. (2012).

The connection between FR and macroeconomic aggregates has been extensively studied in the literature. Notable findings include the positive effect of these rules on reducing economic volatility (Fatás & Mihov, 2006) and their influence on interest rates (Iara & Wolff, 2014). Additionally, research shows that FR can have significant implications for fiscal sustainability (Bova et al., 2014; Dahan & Strawczynski, 2013; Fabrizio & Mody, 2006; Hallerberg et al., 2009; Neyapti, 2013).

However, it is important to note that the side effects of FR have not been widely explored, especially concerning social variables such as inequality and poverty.

Overall, FR are not explicitly designed to combat inequality and poverty. However, they have direct effects on fiscal policy, which consequently tends to have a more pronounced impact on II. The dynamics between II and FR can occur through at least three transmission channels.

Firstly, as argued by Debrun and Kumar (2007),Taps (2012) and Combes, Debrun, Minea, and Tapsoba (2018), the most direct channel through which FR influences II is the fiscal balance. The fiscal balance directly impacts the dynamics between government revenues and expenditures, making the composition of these variables relevant for reducing II. The progressiveness of spending and taxes is a determining factor for aggregate demand and, therefore, for II.

Next, fiscal consolidation programs play a significant role, with the implementation of FR being key in the pursuit of fiscal sustainability (Guichard, Kennedy, Wurzel, & André, 2007). Studies suggest that the type of fiscal consolidation matters for II. Programs focused on expenditure cuts have been associated with an increase in II (Agnello & Sousa, 2014;

Ball, Furceri, Leigh, & Loungani, 2011; Woo et al., 2017), while those based on tax increases have reduced II (Ciminelli, Ernst, Merola, & Giuliodori, 2019).

Thirdly, the cyclicality of fiscal policy and borrowing costs also influence how fiscal policy varies over time in response to economic cycles and government borrowing costs. The results generated in these processes can impact the dynamics of public debt and the credibility of fiscal policy, which in turn affect various determinants of II. Capital flows (Figini & Gorg, 2011), trade (UNCTAD, 2019), globalization factors, education (Goldin & Katz, 2009) and the labor market (Berg, 2015) are highlighted as factors influenced by fiscal policy credibility that can impact II.

Based on the findings from the Appendix B survey, there is a notable shortage of studies on the effects of FR on II. This research aims to address this gap by conducting a comprehensive analysis covering both emerging and advanced countries. Furthermore, this research advocates for the adoption of the Local Projections analytical technique, a novel approach within this literature. This technique is designed to quantify effects over time stemming from the implementation of FR on II. Finally, this research offers novel estimations for Revenue Rules.

3 Database and Methodology

3.1 Database

The sample utilized in this study consists of an unbalanced panel, primarily due to data availability constraints, with annual frequency. The selected period spans from 1995 to 2019, intending to capture the onset of the widespread implementation of FR at the same time that the dynamics of II are changing. Furthermore, the analysis includes a division in the estimates between emerging and advanced economies. This approach allows for a comprehensive examination of the effects of FR on II across different economic contexts over a significant period.

- **Income inequality:** To represent the variable of interest, this study utilized the Gini Index of Disposable Income (after transfers and taxes) from the Standardized World Income inequality Database (SWIID) developed by Solt (2016). The Gini Index ranges from 0 (indicating complete equality) to 100 (indicating complete inequality).

  One of the main advantages of using the SWIID lies in its ability to standardize data from various sources, including the World Bank, Eurostat, the OECD Income Distribution Database, among others. This standardization process helps to reduce the uncertainty associated with the Gini Index, allowing for more precise comparisons between different datasets.

  In summary, the standardization process of SWIID follows a Bayesian approach, which involves the application of statistical and probabilistic methods to adjust and harmonize the different data sources, making them comparable for analysis. This ensures the reliability and consistency of the Gini Index data used in the study.

- **Fiscal Rules:** This study utilized the IMF database constructed by Schachter et al. (2012) to represent the FR within the models. To do so, dummy variables were employed, where 0 represents the absence of a rule and 1 indicates its presence. These dummy variables correspond to Debt, Budget Balance, Expenditure and Revenue rules.

- **Controls:** In this research, the fiscal variables were obtained from the IMF database. The focus was on government expenditure as a percentage of GDP, as it is directly controlled by the government and has significant potential to influence II dynamics. Additionally, Central Government Debt expressed as a percentage of GDP was incorporated to assess the effectiveness of fiscal measures and the burdens associated with high public debt. This variable was lagged by one period, as suggested by Combes et al. (2019).

  While national FR typically applies to the concept of "General Government," which includes various government entities, including state and local governments and social security funds, this study concentrated on the Central Government. This decision was made because the Central Government holds the majority of public debt and provides more comprehensive data. The dynamics of the Central Government did not significantly affect the results of this research. The selection of these variables aimed to cover the three main transmission channels of fiscal rules to the dynamics of public debt, as highlighted in the literature.

  To capture economic growth, real GDP, expressed in millions of 2017 US dollars, divided by the population (in millions of people), sourced from the Penn World Table, was adopted. The variable was included with a logarithm, as suggested by R. J. Barro (2008).

  For globalization, the KOF Globalization Index was used, which encompasses economic, social and political globalization sub-indices weighted equally to form the overall indicator. This indicator has been utilized by Bergh and Nilsson (2010) and other authors.

  Lastly, the proxy for education was the V-Dem variable of average years of schooling of the total population aged 15 and above.

3.2 Particular Cases

In this section, we conducted a survey of selected cases where the dynamics of the chosen economies broadly reflect the pattern of the group to which they belong. We delve into the evolution of the Gini Index over time, along with the implementation (not revision or alteration) of certain types of FR.

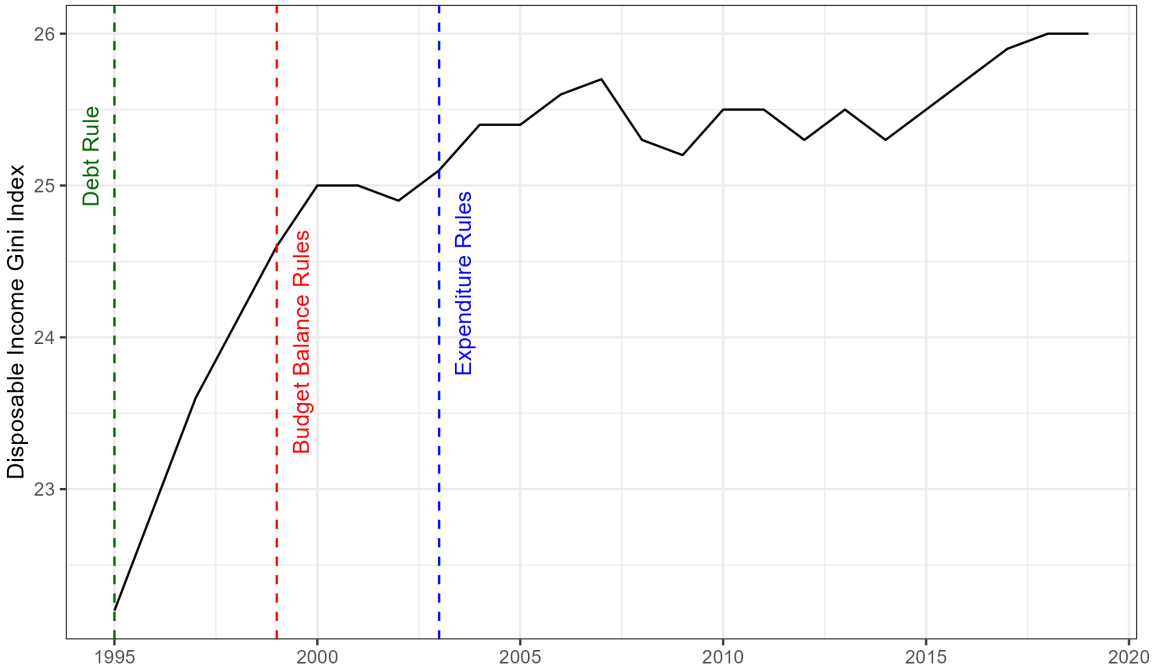
3.2.1 Advanced Economies

- **Finland**

Finland implemented three types of FR without enforcement mechanisms. The first one is the Debt Rule (1995-2006; since 2011), aiming to keep the Central Government deficit below 1% of GDP. The second one is the Budget Balanced Rules (since 1999, revised in 2011), aiming to achieve surpluses of 1% of potential GDP during 2007-2011, with a tolerance band for short-term deviations. Since 2011, the target has been adjusted to 1% of nominal GDP. The third rule is the Expenditure Rules (since 2003), which sets annual limits in real terms for non-cyclical primary spending.

Among other factors that influenced the dynamics of II in Finland, we can mention the crisis of the 1990s that led to a long-term increase in unemployment until the early 2000s (Paukkeri, Ravaska, & Riihelä, 2023). After these periods, changes in II tended to be more related to cyclical fluctuations (Blomgren et al., 2014). Furthermore, there has been a notable slowdown in average growth in hourly wages and annual earnings since 2008.

Figure 3: Gini Index and the Introduction of FR in Finland



Source: Own elaboration with data from Schaechter et al. (2012) and Solt and Frederick (2020).

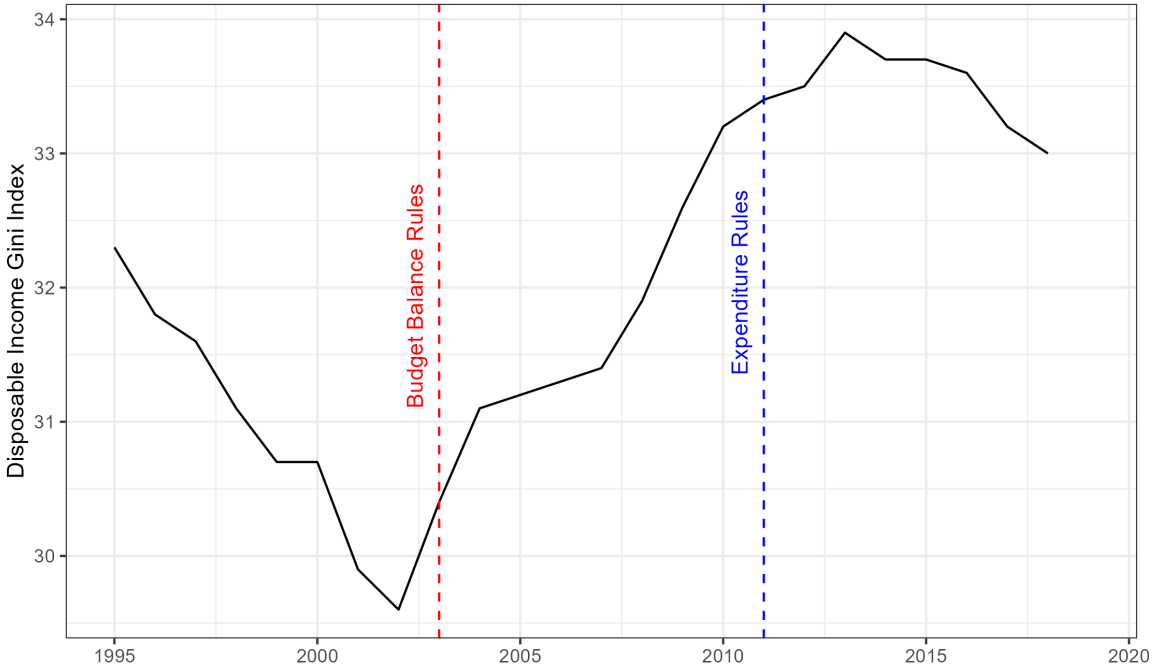
- **Spain**

  Spain implemented two fiscal rules with enforcement mechanisms. The first one is the Budget Balanced Rules (2003-05; 2006-11; revised in 2011). Initially, the deficit target was adjusted according to economic stability. During the period from 2006 to 2011, the rule considered the economic cycle, requiring the deficit not to exceed a certain percentage of GDP in times of low growth, and seeking surpluses in times of strong expansion. Since 2011, the rule also aims to limit public debt to 60% of GDP from 2020 onwards and allows additional spending of 0.5% of GDP on public investment, provided

it is justified. Exceptional deficits must be followed by a medium-term adjustment plan. The second rule is the Expenditure Rules (2011), which limits the nominal spending of central and local governments to the nominal growth of GDP in the medium term.

Among the events that changed II, we highlight that the Spanish labor market is affected by structural issues that contribute to rising II, as unemployment is often high and highly sensitive to cyclical fluctuations. Additionally, II was considered highly countercyclical in a period in the country, a phenomenon evidenced by the economic boom that occurred until 2007 (Anghel, Bover, Hospido, Ortega, & Regil, 2023; Ayala & Cantó, 2018). Since the 2008 crisis, unemployment has been identified as one of the main drivers of increasing II, along with rising wage disparity. Another point to note is the limited redistributive capacity of the country's fiscal system, whose weakness became more evident after 2008 (Ayala & Cantó, 2018).

Figure 4: Gini Index and the Introduction of FR in Spain



Source: Own elaboration with data from Schaechter et al. (2012) and Solt and Frederick (2020).

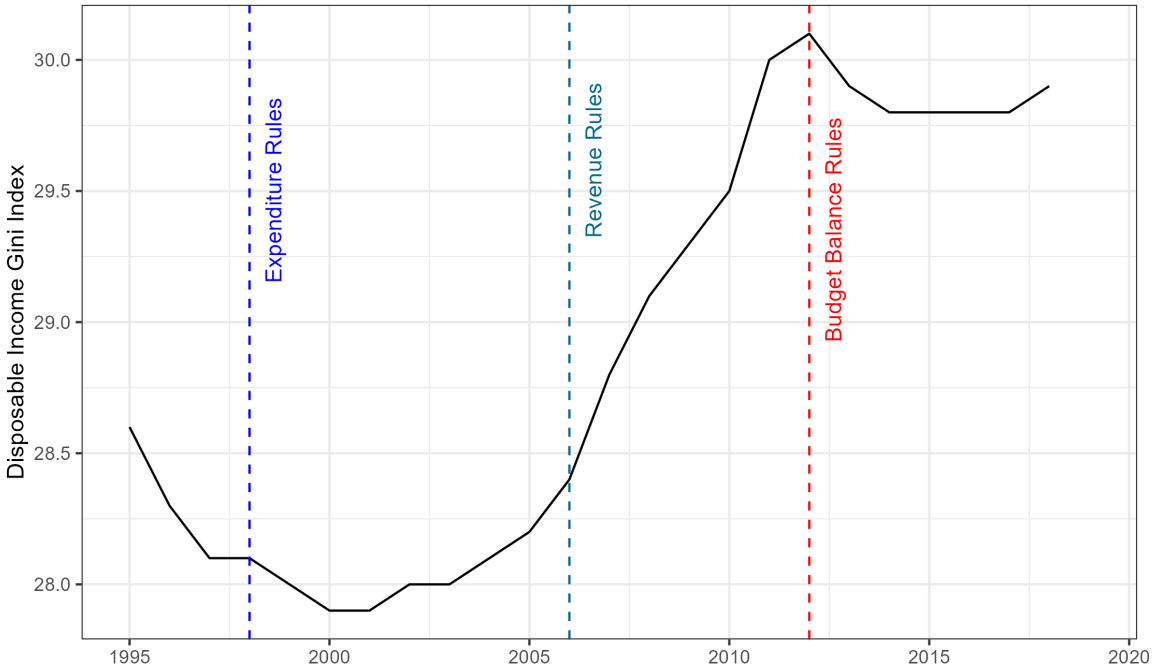
- **France**

  France has implemented three fiscal rules with enforcement mechanisms only for the Budget Balanced Rules. The Expenditure Rules (1998) aim to increase real or nominal expenditures, excluding interest and pensions. The Revenue Rules (since 2006; revised in 2011) initially allowed central and local governments to set revenues higher than projected, but later established mandatory minimum targets for the net impact of new revenue measures. The Budget Balanced Rule (2012) requires the country to follow a plan for structural balance.

  Among the characteristics that influenced the dynamics of II in France, we highlight

the increase in youth unemployment from 1997 to 2002, followed by stability. Another factor contributing to the rise in II was the growth of self-employed workers since 2003 (Bozio et al., 2023). Additionally, wage inequality began to intensify in the mid-90s (Godechot, 2012). Besides the weaknesses in the labor market, the French social protection system faces challenges in directing expenditures efficiently, largely due to the weight of pension and healthcare expenses (OECD, 2007) (OECD Economic Survey France, 2007).

Figure 5: Gini Index and the Introduction of FR in France



Source: Own elaboration with data from Schaechter et al. (2012) and Solt and Frederick (2020).

3.2.2 Emerging Economies

- **Argentina**

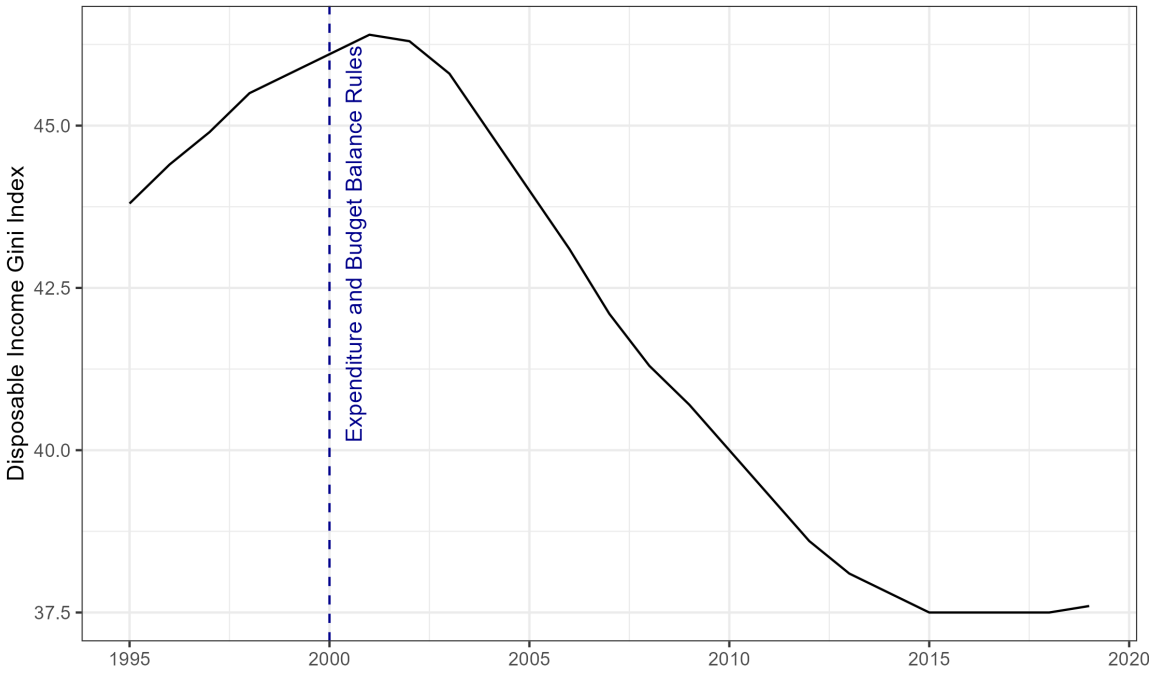
  Argentina adopted enforcement mechanisms for FR. The Expenditure Rules (since 2000; revised in 2017), in general, limited the growth of primary expenditures concerning nominal GDP or in real terms during periods of economic recession. After being suspended between 2009 and 2017, new rules were established, where current primary expenditures cannot grow more than inflation; while for those that reached primary balance, the limit is nominal GDP. Additionally, public employment growth cannot exceed population growth.

  The Budget Balanced Rules (2000-2017) required central and local governments to maintain balanced accounts, except for investments in basic social and economic infrastructure and projects financed by international financial institutions. This rule was suspended between 2009 and 2017 and later abolished. However, the Fiscal

Responsibility Law (FRL) encouraged local governments to establish countercyclical funds and imposed limits on entity indebtedness, aligned with revenue dynamics.

Diverging from the trend of the 90s, Argentina experienced in the 2000s a process of formalization and flexibilization of the labor market across all categories of workers, while simultaneously reducing wage disparities (Maurizio, 2015). During this period, the government took a more proactive approach, ensuring a more equitable social protection system for low-skilled workers, as well as strengthening labor institutions (Gasparini & Cruces, 2010; Lustig, Lopez-Calva, & Ortiz-Juarez, 2013).

Figure 6: Gini Index and the Introduction of FR in Argentina



Source: Own elaboration with data from Schaechter et al. (2012) and Solt and Frederick (2020).

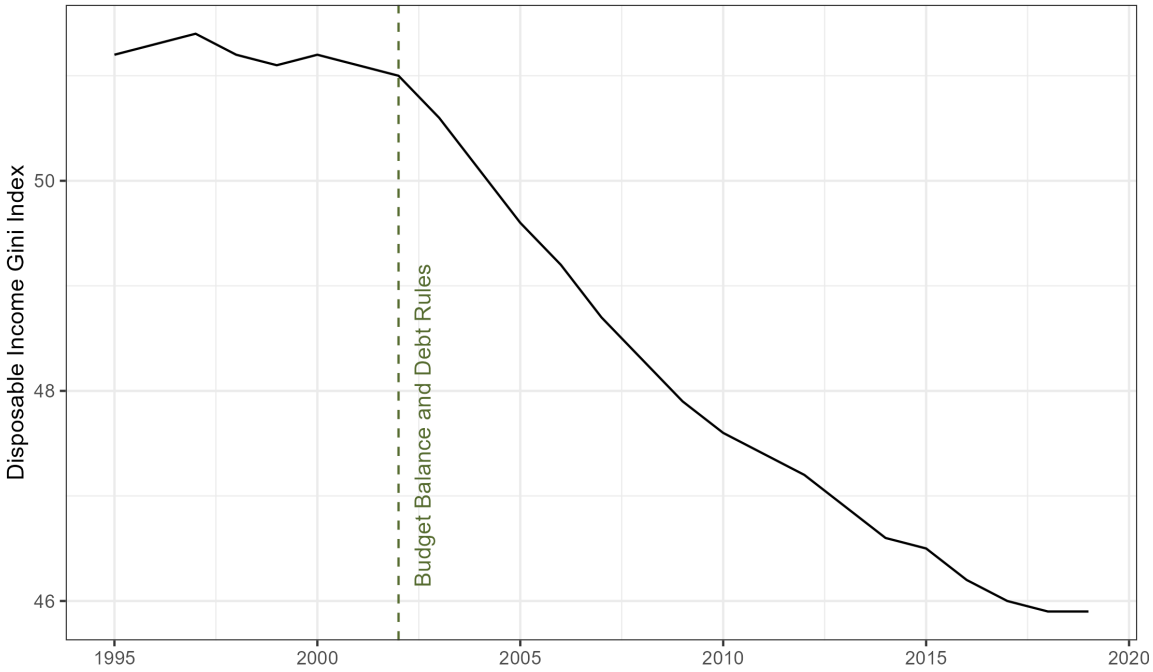
- **Panama**

  Panama adopted two FR with no enforcement mechanisms. The Budget Balanced Rule (2002-07; since 2009; revised in 2012) was implemented as part of the FRL, limiting the deficit of the non-financial public sector to 1% of GDP, adjustable to 3% during periods of weak economic growth. In 2008, the FRL was replaced by the Social and Fiscal Responsibility Law, which set new deficit limits and public debt goals. Safeguard clauses were included for situations of natural disasters, national emergencies, and economic recessions. In 2012, the concept of "adjusted balance" of the non-financial public sector was introduced, setting new deficit limits until 2018. The Debt Rule (2002-07; since 2009) was established as part of the FRL, with a maximum limit of 40% of GDP until 2014. Starting in 2009, the LRF was replaced by a new Social and Fiscal Responsibility Law to address the economic crisis.

  Strong economic growth and macroeconomic conditions favored the income expansion

process of Panama's population in the 2000s. During the same period, Panama watched an increase in government instruments to promote higher-quality jobs, investments in education, greater inclusion of women in the economy, and a slight improvement in the distributive function of fiscal policy can be observed (OECD, 2017).

Figure 7: Gini Index and the Introduction of FR in Panama



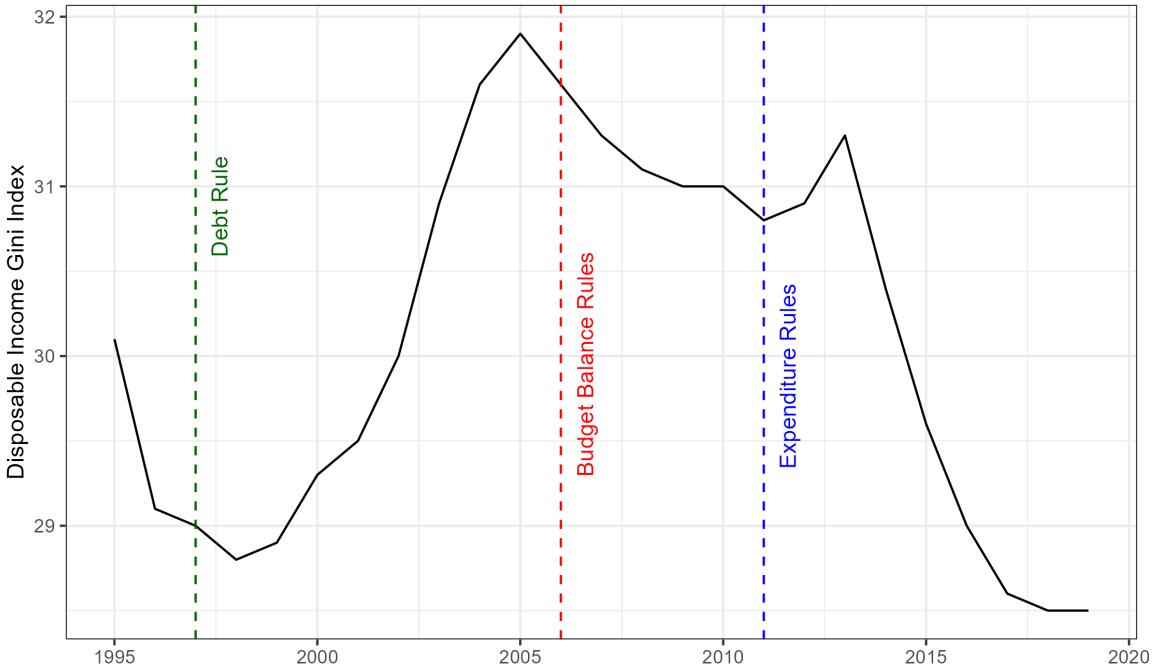
Source: Own elaboration with data from Schaechter et al. (2012) and Solt and Frederick (2020).

- **Poland**

  Poland doesn't have enforcement mechanisms only for Budget Balanced Rules. The Debt Rule (1997) capped general government debt at 60%, with corrective triggers if debt approached its limit and in exceptional cases (war, natural disasters, etc.). The Budget Balanced Rule (2006-07) stipulated that the central government should adhere to a fiscal anchor for 4 years. The Expenditure Rules (since 2011; revised in 2015) regulated discretionary spending increases to 1% of real growth. With the revision, price indexation was changed to create fiscal space for a child benefit program.

  After witnessing an increase in II, Poland made some changes that influenced the stability of this variable starting in 2007, with the main ones being the reforms of the tax-benefit system and the family allowance system, along with a decrease in wage dispersion, one of the main determinants of II previously (Brzeziński, 2017). In 2015, the launch of the Family 500+ social program was one of the main drivers that helped reduce II by reaching the lower-income layers of families (Jędrzejczak & Pekasiewicz, 2020).

Figure 8: Gini Index and the Introduction of FR in Poland



Source: Own elaboration with data from Schaechter et al. (2012) and Solt and Frederick (2020).

Finally, the description of the countries includes events and facts that contributed to the change in the dynamics of the II, considering that the FR are not the only or primary causes for such changes. Graphic analysis is a limited tool for exploring the proposed theme, so the introduction of econometric methods can bring more relevant and robust conclusions. In other words, by considering the controls in the models, the aim is to isolate the short and long-term effects of other variables that influenced the change in II, whether cyclical, structural, or shock-related. Therefore, empirical models seek to demonstrate only the effects of FR on II. Additionally, the graphs suggest a certain lag between the implementation of RF and the change in II. Therefore, another advantage of adopting econometric methods is that we can verify if this hypothesis is valid.

3.3 Method

The chosen method for exploring the topic of this study is Local Projections (LP) emerged in 2005 as an alternative to Vector Autoregressive Models (VAR) in applied macroeconomics. The fundamental concept behind LP is to estimate impulse-response functions within a dynamic system. Unlike VAR, LP applies a shock only to the reference period instead of propagating this shock to subsequent periods. This feature is particularly relevant for the present study, as it captures both a change in the dynamics of II and the implementation of FR.

LP offers several advantages, as highlighted by Jordà (2005). Firstly, it can accommodate estimations through the Ordinary Least Squares method and handle nonlinear relationships, which are common in multivariate scenarios. In the context of this study, LP demonstrates

sufficient flexibility to estimate panel structures.

In terms of inference, LP provides both individual and joint results without the need for asymptotic approximations. Additionally, its results remain robust even in the presence of misspecifications, a significant advantage compared to VAR, as demonstrated by Ramey (2016). This robustness is particularly valuable as errors do not accumulate, contributing to the reliability of the analyses.

The choice of the LP method was driven by several factors. Firstly, LP is suitable for analyzing dummy variables, making it effective for handling the shock introduced by FR in this study. Unlike the VAR method, LP can generate impulse-response functions for this type of data, providing a more appropriate framework for the analysis.

Secondly, there is a scarcity of studies that utilize LP to examine the relationship between II and FR. This presents an opportunity to contribute novel insights to the existing literature by employing LP in this context.

Thirdly, LP has been widely employed in studies investigating issues related to fiscal policy (Auerbach & Gorodnichenko, 2013; Aye, Clance, & Gupta, 2019; Jordà & Taylor, 2016; Ramey & Zubairy, 2018) and panel data (Owyang, Ramey, & Zubairy, 2013; **?**). Its versatility and applicability in similar research contexts lend credibility to its use in this study.

Lastly, LP allows for the estimation of impulse-response functions within the sample itself, enabling the testing of hypotheses regarding the lag in the propagation of the effects of implementing FR on II.

The impulse-response equations investigated in this study adhere to the subsequent specification:

$$\Delta_h Gini_{i,t} = \alpha_{i,h} + \beta_h FRi, t + \gamma_h X_{i,t} + \epsilon'_{i,t+h} \quad h = 0, 1, \ldots, H-1 \tag{1}$$

Where:

$\Delta_h Gini_{i,t} = Gini_{i,t+h} - Gini_{i,t-1}$,
$\alpha_{i,h}$ represents the fixed effects of the cross-sectional units indexed by$i$,
β_h is the coefficient associated with the shock given in $FR_{i,t}$,
γ_h is a vector of coefficients associated with the $X_{i,t}$, which is the vector of control variables,
$\epsilon'_{i,t+h}$ is the error term,
h is the time horizon, with H = 10 periods.

The estimation of this study involves creating a model for each rule and each group of interest. In these models, the rule for which the shock was given is endogenous and the other variables are exogenous, including the other rules, since it is quite common in economies to use combinations of different types of rules (Eyraud et al., 2018).

4 Results

Overall, the results converge in some aspects with empirical studies related to the theme but also present differences. Regarding emerging economies, significant impacts of shocks on II were not observed, except in the case of Budget Balance Rules. This is in line, to some extent, with the study by Ulloa-Suárez (2021), which did not find significant impacts of FR in Latin American countries and with the study by Combes et al. (2019), which highlighted that the implementation of the Budget Balance Rules is associated with a reduction in II.

In contrast, in advanced economies, all models indicated an increased II following the implementation of a FR, although at different times and intensities. This is similar to what was observed by Hartwig and Sturm (2019), who highlighted that FR had impacts on increasing II in the European Union.

A notable point, highlighted by Schachter et al. (2012), is that emerging economies have demonstrated having stricter national restrictions and enforcement mechanisms for various aspects of FR even before advanced economies. To some extent, advanced economies intensified such characteristics after the 2008 crisis. Several factors contribute to explaining the differences found, not only the design of the FR in each group but also the selected period and the economic structure of each.

Regarding advanced economies, fiscal consolidation programs in the 1990s were accompanied by higher short-term unemployment, the extent of the impact on income distribution depended on automatic stabilizers and private demand. Thus, the effects of anti-unemployment policies helped mitigate the effects on II. However, cuts in government services may have disproportionately affected low-income families, as explained by the Chu et al. (2012) and Organization for Economic Cooperation and Development (OECD) (2011).

Moreover, the way fiscal adjustments were made in advanced economies played a significant role in increasing II. These programs mostly emphasized cuts in public spending rather than tax increases. An analysis of the composition of reduced spending reveals that social transfers and distribution programs were affected (A. Alesina & Ardagna, 2009; A. F. Alesina & Perotti, 1996; M. D. Coady & Gupta, 2012). Consequently, as discussed earlier, cuts in social spending tend to have a more negative impact on income distribution (Agnello & Sousa, 2014).

On the other hand, emerging economies also underwent fiscal consolidation programs in the 2000s, but these episodes were shorter compared to advanced countries. This resulted in less intense effects on unemployment, which, according to the M. D. Coady and Gupta (2012), contributed to an improvement in income distribution after the adjustment period.

An additional significant characteristic of emerging economies, also highlighted by M. D. Coady and Gupta (2012), is the lack of progressivity in public spending. Therefore, during periods of fiscal adjustment, the concentration of cuts can result in a process that improves equity in public spending and provides protection to the most vulnerable families.

Lastly, the full set of estimates is available in the Appendix(C to F). Subsequently, we present the impulse response functions for each model examined.

4.1 Debt Rule

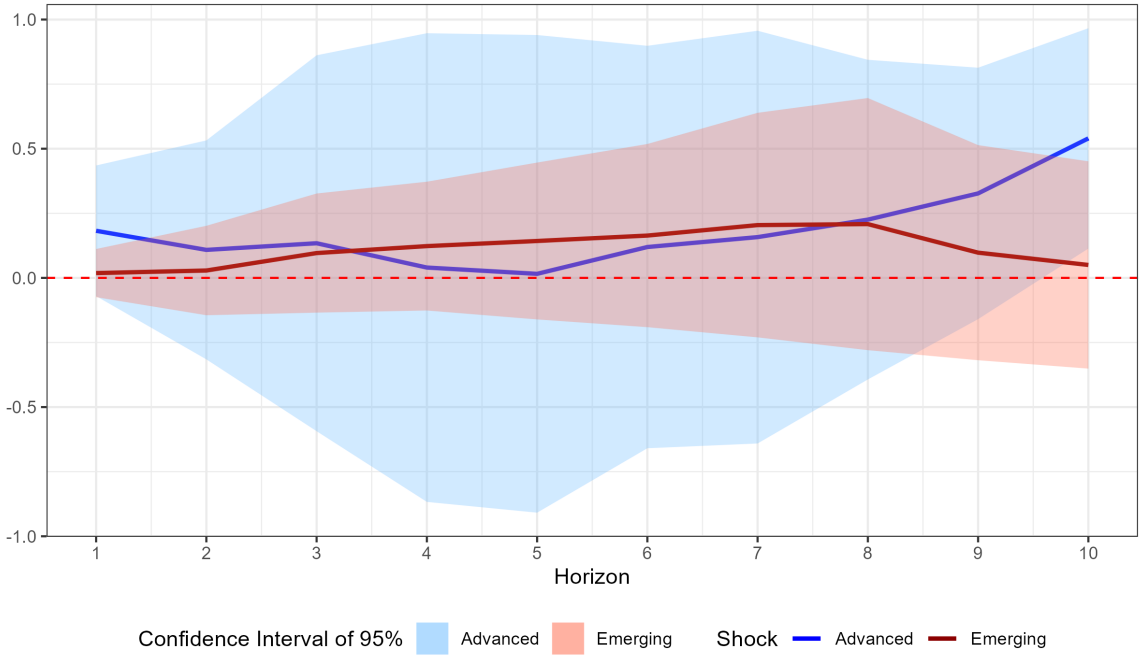
The results of this exercise corroborate some of the characteristics pointed out byCaselli et al. (2022); Davoodi et al. (2022); Schachter et al. (2012). In this context, it is important to note that this type of FR is mostly implemented in conjunction with other rules and, therefore, its effects on II are influenced by various factors, not just a set debt target. As explained by Schachter et al. (2012), the Debt Rule has the characteristic of easily communicating fiscal anchoring but has limitations in their short-term orientation. In this sense, as the Budget Balance Rules are more dominant, a possible effect of the Debt Rule is to allow greater fiscal space for investments since the limit established by it is not as strict (Combes et al., 2019).

The results reflect this complexity, as many of them do not reach statistical significance and are characterized by a high degree of uncertainty, as evidenced by the confidence intervals of the shocks. When we specifically look at advanced economies, we observe that only one period of significance is identified, in which II shows a slight increase. On the other hand, emerging economies did not show statistically significant results.

According to the evidence, the increase in II in advanced economies might be attributed to fiscal consolidation programs and the composition of the balance. As discussed earlier, many advanced economies have chosen to restrain spending rather than increase taxes as part of these programs, which has had a more pronounced effect on the rise of II. Consequently, analyses of the fiscal balance in some markets have shown a decrease in social spending in these economies (A. Alesina & Ardagna, 2009; A. F. Alesina & Perotti, 1996; M. D. Coady & Gupta, 2012).

Another factor that may have influenced II is the poor short-term stabilization function, as suggested by Schachter et al. (2012). Therefore, during the 1990s, when economic slowdowns were creating imbalances in the economy, this rule may have responded inadequately to shocks.

Figure 9: Response of Income Inequality to the Implementation of Debt Rule



Source: Own elaboration.

4.2 Budget Balance Rules

The results of a shock to Budget Balance Rules pointed in opposite directions for advanced and emerging markets. While the former indicated an increase at certain moments, the latter suggested a decrease in II after some periods.

In the case of advanced economies, the results reinforce perspectives discussed previously and addressed by previously cited authors. These FR are more closely associated with the sustainability of public debt and is generally implemented in conjunction with the Debt Rule. The applied shock revealed a positive effect on II, which may be favored by the reduction in social spending resulting from the design of fiscal consolidation programs (A. Alesina & Ardagna, 2009; A. Alesina & Perotti, 1995; M. D. Coady & Gupta, 2012).

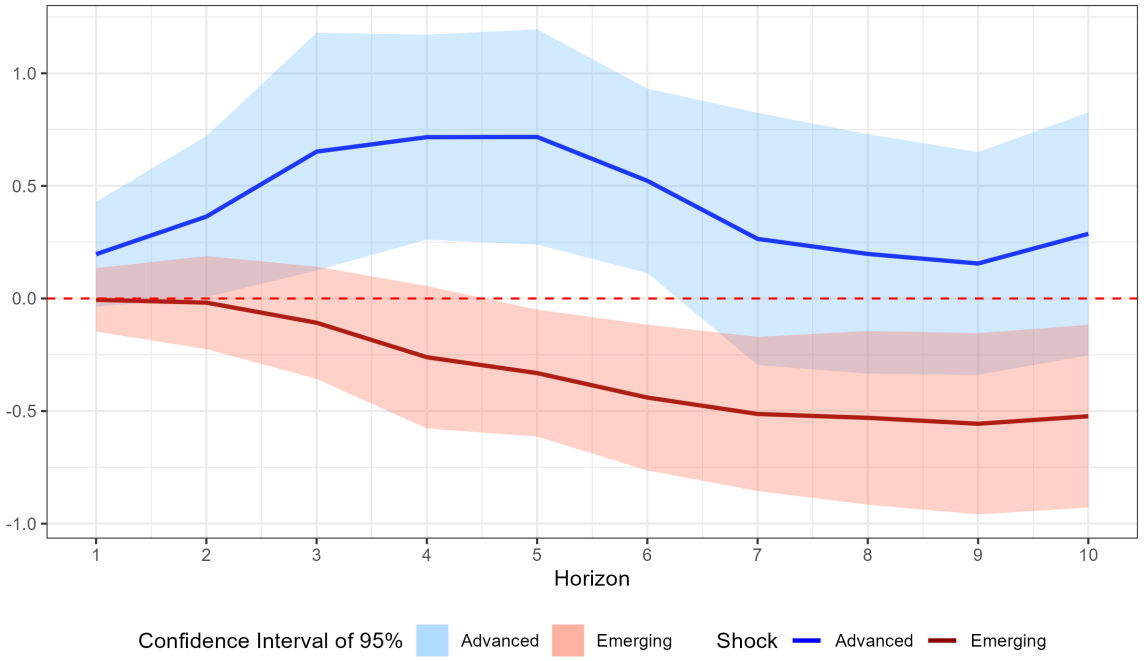
As observed with the Debt Rule, depending on the design of Budget Balance Rules, pro-cyclical dynamics and difficulties in incorporating corrective and stabilization measures may arise. Consequently, this characteristic might exert negative influences on income distribution.

From the emerging economies perspective, in seeking a balanced budget, adjustments made by the consolidation programs in this group may have contributed to the reduction of II through greater progressivity in spending (M. D. Coady & Gupta, 2012). This suggests, to some extent, that the cuts made did not impact social benefits but rather other current expenses.

Additionally, Combes et al. (2019) found a similar result. In their analysis, the authors reinforce that Budget Balance Rules cannot affect total government spending, as seen in Dahan and Strawczynski (2013). Furthermore, according to Guerguil, Mandon, and Tapsoba

(2017), this type of rule has greater effects on investment, which may favor greater fiscal space to address II issues.

Figure 10: Response of Income Inequality to the Implementation of Budget Balance Rules



Source: Own elaboration.

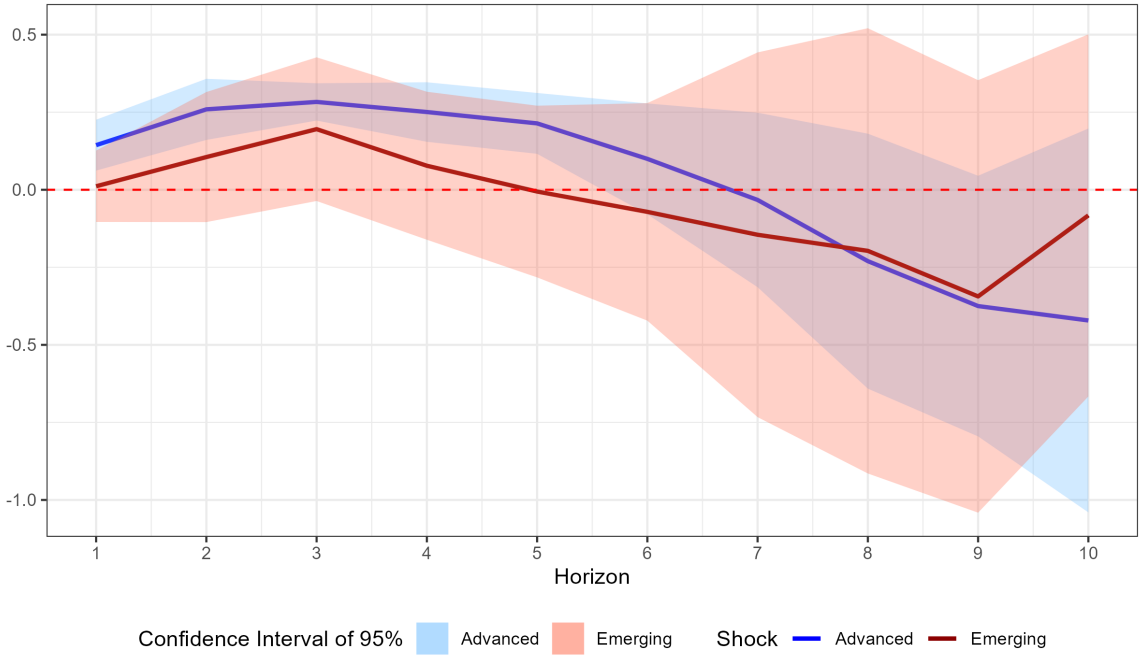
4.3 Expenditure Rules

The application of shocks to expenditure rules in advanced economies revealed a significant and positive impact, characterized by little uncertainty as reflected in the narrow confidence interval. These findings corroborate the perspectives discussed previously, as well as those presented by the aforementioned authors. Specifically, given the prevalence of this rule in advanced economies and the tendency of such markets to have opted to cut expenditure during consolidation programs, we observed an increase in income inequality.

Furthermore, this rule alone does not respond effectively to economic shocks, as it is not compatible with fiscal stimulus. Therefore, during periods of economic slowdown, this rule restricts the support provided by fiscal policy.

In emerging economies, the shock did not show statistical significance. This aligns with observations by Ulloa-Suárez (2021). (2021) and may indicate limited implementation of Expenditure Rules in these economies. Notably, Budget Balance and Debt Rules are more common in emerging economies, often introduced alongside with Expenditure Rules because the latter alone can not ensure fiscal sustainability.

Figure 11: Response of Income Inequality to the Implementation of Expenditure Rules



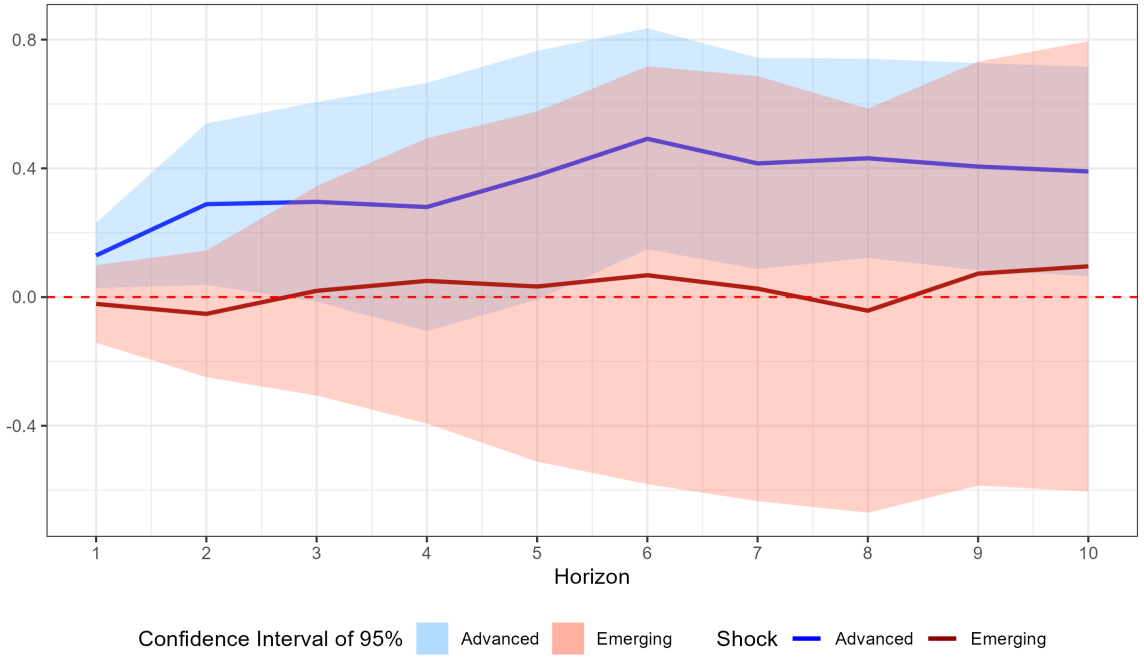
Source: Own elaboration.

4.4 Revenue Rules

In the case of Revenue Rules, the models are more complex to analyze for several reasons. Firstly, few countries, both emerging and advanced, adopt this type of rule. Secondly, revenues are a variable that is often beyond the government's control. Additionally, empirical studies on the analyzed topic generally choose not to analyze Revenue Rules. Therefore, interpreting the results requires caution, but some hypotheses can help explain the models.

This type of rule is not directly linked to fiscal sustainability as it does not control expenditure. This can contribute, to some extent, to a pro-cyclical movement (Jung & Kim, 2021; Schachter et al., 2012). Therefore, this rule is often accompanied by other types of rules, mainly Budget Balance and Debt rules, as these directly address the pursuit of fiscal sustainability. Consequently, the pro-cyclical dynamics of fiscal policy may have contributed to the increase in income inequality in advanced economies, while no significant effects were observed in emerging economies

Figure 12: Response of Income Inequality to the Implementation of Revenue Rules



Source: Own elaboration.

5 Conclusion

The present research aimed to empirically analyze the effects of four types of FR on II in two distinct economic groups. The relevance of this study lies in the need to understand how fiscal constraints can impact income distribution, considering that fiscal policy is a crucial tool in promoting social equity. II, in turn, is a relevant study topic as it tends to negatively influence various macroeconomic aggregates.

Within the analyzed period, the dynamics and composition of II changed, coinciding with the widespread implementation of FR globally. Public support for income distribution also gained more intensity within the selected time frame. Many recent studies on FR have not examined the side effects that the introduction of this type of practice has on different social variables, including II. Many of them opted to assess the behavior of public debt and fiscal sustainability, among other types of macroeconomic aggregates.

Regarding the studies addressing the theme of this study, they focused on unfolding the behavior of II only in isolated economic groups and analyzing only three types of rules (Debt, Expenditure and Budget Balanced). Unlike them, this study chose to divide the applications into emerging and advanced economies, given that economic structure matters for both II and the design of FR, and to create an estimation for Revenue Rule. Furthermore, the study also differs through the method. The choice of LP is based on the intention to impacts of FR on II may only be observed with a lag.

Regarding the transmission channels between the variables of interest, we can mention at least three. The first one concerns the composition of the fiscal balance, which has a

direct effect on aggregate demand. The second one is fiscal consolidation programs, where the pursuit of fiscal sustainability tends to generate effects on income distribution. Finally, the costs of public debt and the cyclicality of fiscal policy affect the distributive function of this type of policy and, therefore, create impacts on determinants of II.

In analyzing the results, it was observed that the shocks on FR exhibited varying intensity and significance over different time horizons in II. In other words, the results suggested that not all FR can affect II, and when they do, the effects are not symmetrical in terms of intensity and persistence. Some control variables sometimes proved to be more relevant in addressing II than an FR, as supposed in the section on particular cases. Additionally, the economic structure of the selected groups emerged as a relevant factor.

In general, all models for advanced economies showed an increase in II with the implementation of an FR. Conversely, models associated with Budget Balance and Expenditure Rules for emerging markets indicated a mitigating effect on II, while the remaining models showed a neutral stance.

The main differences found in the results between the groups can be explained, in part, by the transmission channels. While fiscal consolidation programs in advanced economies lasted longer, mainly focusing on spending cuts, emerging economies, on the other hand, had shorter programs that generated greater progressivity of public spending. In other words, the fiscal balance of these countries contributed significantly to driving changes in the dynamics of II.

Another point to highlight is the response of public debt to shocks, which unanimously proved to be an important vector for reducing II (Appendix C to F). This fact is tied to the issue of the cyclicality and costs of debt. For both groups, the reduction of debt may have created greater fiscal space, thus favoring governments' ability to promote countercyclical policies, investments, social policies and others.

Finally, the work can be extended in various ways. Among some of them, we can mention an application on poverty to verify the different effects of FR regarding II, a comparison between the effects of subnational rules with national rules, the specific characteristics of each FR and why they generate different impacts among nations, including a variable summarizing revenue dynamics. Moreover, the IMF dataset contains various additional information about FR and we leave these features for future research.

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6 Appendix

6.1 Appendix A: Selected Countries

The definitions of emerging and advanced economies followed the IMF division.

Emerging Economies

Albania	Algeria	Angola	Argentina
Armenia	Aruba	Azerbaijan	Bahrain
Bangladesh	Barbados	Belarus	Belize
Benin	Bhutan	Botswana	Brazil
Brunei Darussalam	Bulgaria	Burkina Faso	Burundi
Cabo Verde	Cameroon	Chad	Chile
China	Colombia	Comoros	Costa Rica
Djibouti	Dominica	Dominican Republic	Ecuador
Egypt	El Salvador	Equatorial Guinea	Eswatini
Ethiopia	Fiji	Gabon	Georgia
Ghana	Grenada	Guatemala	Guinea
Guinea-Bissau	Haiti	Honduras	Hungary
India	Indonesia	Iraq	Jamaica
Jordan	Kazakhstan	Kenya	Kuwait
Lebanon	Lesotho	Liberia	Madagascar
Malawi	Malaysia	Maldives	Mali
Mauritania	Mauritius	Mexico	Mongolia
Montenegro	Morocco	Mozambique	Myanmar
Namibia	Nepal	Nicaragua	Niger
Nigeria	North Macedonia	Oman	Pakistan
Panama	Paraguay	Peru	Poland
Philippines	Qatar	Romania	Rwanda
Saudi Arabia	Senegal	Serbia	Seychelles
Sierra Leone	South Africa	Sri Lanka	Sudan
Suriname	Tajikistan	Thailand	Togo
Trinidad and Tobago	Tunisia	Turkmenistan	Uganda
Ukraine	Uruguay	Uzbekistan	Yemen
Zambia	Zimbabwe		

Advanced Economies

Australia	Austria	Belgium	Canada
Croatia	Cyprus	Czech Republic	Denmark
Estonia	Finland	France	Germany
Greece	Iceland	Ireland	Israel
Italy	Japan	Latvia	Lithuania
Luxembourg	Malta	New Zealand	Norway
Portugal	Singapore	Slovenia	Spain
Sweden	Switzerland	United Kingdom	

6.2 Appendix B: Empirical Studies Review

Table 3: Empirical Studies on the Determinants of Income inequality

Authors	**Objective**	**Sample**	**Conclusions**
Hailemariam; Sakutukwa and Dzhumashev (2021)	Investigate the main determinants of income inequality using the Local Projections and Vector Autoregressive methods.	OECD countries from 1870 to 2016.	Income inequality is negatively associated with government spending and educationand positively with GDP per capita, with significance in all cases.
Coady and Dizioli (2017)	Present new results on the impacts of education on income inequality through a dynamic panel with Ordinary Least Squares (OLS) and Seemingly Unrelated Regressions (SURE).	Advanced and emerging countries with Gini index in five-year intervals from 1980 to 2010.	The results indicate a large, positive, statistically significant relationship between educational inequality and income inequality, especially in emerging and developing economies.
Bergh and Nilsson (2010)	Investigate the effects of economic freedom and globalization on income inequality through a dynamic panel with Generalized Method of Moments (GMM).	Various countries from 1970 to 2005.	International trade freedom and deregulation tend to increase income inequality, with more pronounced effects in richer countries. Social globalization also increases income inequality, but this effect is more evident in middle- and low-income countries.
Dorn, Clemens and Potrafke (2018)	Reexamine the effects of globalization on income inequality through a dynamic panel with OLS and another dynamic panel with two-stage least squares (2SLS) estimation.	140 countries from 1970-2014	Emerging countries showed a significant, positive relationship, while advanced ones did not demonstrate significance.

Doumbia and Kinda (2019)	Evaluate if a government can reduce income inequality by altering the composition of public spending, keeping total expenditure constant, through a dynamic panel of fixed effects.	83 countries from different income groups.	Affirms that reallocating spending to social protection and infrastructure can reduce income inequality. In countries with weak institutions and high conflict risk, reducing defense spending to finance infrastructure and social programs does not improve income distribution. When social protection and infrastructure spending are reallocated to other areas, income inequality tends to increase.
Anderson, Jalles D'Orey, Duvendack and Esposito (2017)	Explore the effects of government spending on income inequality through a meta-regression.	Focusing on low- and middle-income countries, the work uses a sample of 84 separate studies and over 900 estimates of the effects of various spending measures.	Results suggest a moderate negative relationship between government spending and income inequality, with more pronounced effects for social spending.
Muinelo-Gallo and Roca-Sagalés (2013)	Analyze the effects of economic growth through fiscal policies on income inequality, using SURE and Simultaneous Equations models.	High-income OECD countries for the period from 1972 to 2006.	The results show that distributive spending and direct taxes can result in significant reductions in income inequality. Lastly, the results indicate that the most appropriate fiscal policy strategy in a context of fiscal consolidation is to reduce non-distributive spending, as this can increase GDP growth and, at the same time, reduce income inequality.

Table 4: Empirical Studies on Fiscal Rules and Income inequality

Authors	**Objective**	**Sample**	**Conclusions**
Ulloa-Suarez (2021)	Analyzes the impact of implementing Fiscal Rules (RF) on Income inequality (DR) using the Synthetic Control Method.	Four Latin American countries (Brazil, Chile, Colombiaand Mexico) for the period from 1980 to 2014.	Implementing RF does not increase DR, regardless of the measures used. Analysis of the rules in each country shows that compliance with the existing economic context is crucial and avoids undesirable social effects.
Hartwig and Sturm (2019)	Explore whether RF have side effects, such as a reduction in social spending, using the Dynamic Panel Method with Fixed Effects.	European Union countries for the period from 1975 to 2012.	The application of strict RF is associated with an increase in DR.
Combes et al. (2019)	Investigate countries that adopted or did not adopt RF to analyze the effects on DR using the Propensity Score Method.	84 developing countries for the period from 1990 to 2015.	Implementing RF is associated with a reduction in DR in certain cases. Balance Budget and Debt Rules consistently decrease DR, while spending rules increase it. Additionally, the effects of RF on DR vary depending on structural factors.

6.3 Appendix C: Debt Rule Models Results

Table 5: Debt Model Results for Advanced Economies

	$\Delta_h Gini_{i,t-1}$									
	h = 1	h = 2	h = 3	h = 4	h = 5	h = 6	h = 7	h = 8	h = 9	h = 10
Debt Rule (Shock)	0.182	0.108	0.134	0.040	0.016	0.119	0.158	0.226	0.327	0.540**
	(0.129)	(0.216)	(0.371)	(0.463)	(0.472)	(0.397)	(0.407)	(0.316)	(0.248)	(0.217)
Expenditure Rules	−0.004	−0.072*	−0.200***	−0.350***	−0.485***	−0.622***	−0.752***	−0.847***	−0.917***	−0.891***
	(0.021)	(0.042)	(0.076)	(0.110)	(0.135)	(0.161)	(0.188)	(0.193)	(0.199)	(0.270)
Revenue Rules	0.119***	0.212**	0.264**	0.327**	0.405**	0.477**	0.573**	0.684***	0.698***	0.644***
	(0.045)	(0.084)	(0.127)	(0.160)	(0.191)	(0.231)	(0.232)	(0.201)	(0.202)	(0.176)
Budget Balance Rules	0.141***	0.268***	0.309**	0.275	0.190	0.091	0.033	0.073	0.196	0.332
	(0.044)	(0.093)	(0.140)	(0.174)	(0.203)	(0.244)	(0.280)	(0.303)	(0.337)	(0.337)
Education	−0.007	0.063	0.112	0.129	0.093	0.087	0.139	0.230	0.458	0.928*
	(0.101)	(0.215)	(0.319)	(0.368)	(0.373)	(0.360)	(0.332)	(0.368)	(0.445)	(0.499)
Lagged Central Government Debt	−0.002**	−0.004***	−0.006***	−0.006**	−0.006	−0.006	−0.005	−0.004	−0.008	−0.013**
	(0.001)	(0.002)	(0.002)	(0.003)	(0.004)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)
KOF Index	0.006	0.011	0.019	0.027	0.035	0.037	0.032	0.014	−0.019	−0.049*
	(0.010)	(0.021)	(0.030)	(0.035)	(0.038)	(0.040)	(0.041)	(0.038)	(0.035)	(0.029)
Ln GDP per Capita	−0.411*	−0.827*	−1.138*	−1.234	−1.083	−0.538	0.505	1.398	1.836	1.831
	(0.229)	(0.488)	(0.676)	(0.750)	(0.768)	(0.943)	(1.202)	(1.505)	(1.644)	(1.600)
Expenditures	0.011***	0.018**	0.027*	0.035**	0.045***	0.048***	0.044***	0.036*	0.031	0.021
	(0.004)	(0.009)	(0.014)	(0.016)	(0.016)	(0.016)	(0.016)	(0.019)	(0.022)	(0.021)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 6: Debt Rule Model Results for Emerging Economies

	$\Delta_h Gini_{i,t-1}$									
	h = 1	h = 2	h = 3	h = 4	h = 5	h = 6	h = 7	h = 8	h = 9	h = 10
Debt Rule (Shock)	0.019	0.029	0.096	0.123	0.143	0.164	0.204	0.208	0.098	0.050
	(0.048)	(0.088)	(0.118)	(0.127)	(0.155)	(0.181)	(0.222)	(0.249)	(0.212)	(0.205)
Expenditure Rules	−0.044	−0.077	−0.120	−0.176	−0.186	−0.132	−0.061	0.048	0.185	0.408*
	(0.053)	(0.096)	(0.130)	(0.151)	(0.144)	(0.103)	(0.101)	(0.124)	(0.198)	(0.218)
Revenue Rules	0.175***	0.366***	0.550***	0.708***	0.843***	0.958***	1.032***	1.110***	1.230***	1.349***
	(0.044)	(0.082)	(0.127)	(0.162)	(0.185)	(0.225)	(0.234)	(0.217)	(0.218)	(0.192)
Budget Balance Rules	−0.231***	−0.461***	−0.687***	−0.861***	−0.959***	−1.034***	−1.063***	−1.060***	−1.047***	−1.025***
	(0.030)	(0.049)	(0.084)	(0.124)	(0.150)	(0.183)	(0.203)	(0.205)	(0.201)	(0.159)
Education	0.148***	0.274***	0.379**	0.436**	0.463	0.428	0.382	0.312	0.265	0.245
	(0.044)	(0.093)	(0.150)	(0.216)	(0.287)	(0.347)	(0.389)	(0.393)	(0.380)	(0.375)
Lagged Central Government Debt	−0.001	−0.003**	−0.007***	−0.010***	−0.013***	−0.017***	−0.021***	−0.024***	−0.028***	−0.032***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
KOF Index	0.008	0.006	−0.004	−0.015	−0.019	−0.0003	0.023	0.041	0.057	0.054
	(0.007)	(0.015)	(0.027)	(0.036)	(0.043)	(0.047)	(0.044)	(0.045)	(0.043)	(0.036)
Ln GDP per Capita	−0.220	−0.426	−0.660	−0.866	−0.889	−1.014	−1.193	−1.199	−1.229	−0.985
	(0.174)	(0.362)	(0.529)	(0.620)	(0.693)	(0.861)	(1.070)	(1.230)	(1.336)	(1.238)
Expenditures	−0.005	−0.010	−0.016	−0.021	−0.021	−0.018	−0.018	−0.017	−0.019	−0.022
	(0.006)	(0.011)	(0.015)	(0.018)	(0.021)	(0.024)	(0.028)	(0.031)	(0.036)	(0.036)

Note: *p<0.1; **p<0.05; ***p<0.01

6.4 Appendix D: Budget Balance Rules Models Results

Table 7: Budget Balance Rules Model Results for Advanced Economies

	$\Delta_h Gini_{i,t-1}$									
	$h=1$	$h=2$	$h=3$	$h=4$	$h=5$	$h=6$	$h=7$	$h=8$	$h=9$	$h=10$
Budget Balance Rules (Shock)	0,197	0,364**	0,652**	0,716***	0,717***	0,522**	0,265	0,198	0,155	0,287
	(0,119)	(0,182)	(0,269)	(0,232)	(0,244)	(0,209)	(0,286)	(0,271)	(0,252)	(0,275)
Debt Rule	0,079	0,109	0,158	0,261	0,414	0,650	0,811	0,906	0,965*	0,907*
	(0,071)	(0,168)	(0,298)	(0,390)	(0,456)	(0,509)	(0,542)	(0,564)	(0,582)	(0,546)
Revenue Rules	0,123***	0,215***	0,265**	0,318**	0,381**	0,432*	0,512**	0,607***	0,605***	0,564***
	(0,042)	(0,081)	(0,126)	(0,160)	(0,190)	(0,227)	(0,226)	(0,198)	(0,213)	(0,186)
Expenditure Rules	−0,003	−0,065	−0,199**	−0,364***	−0,523***	−0,689***	−0,836***	−0,931***	−0,984***	−0,934***
	(0,022)	(0,050)	(0,090)	(0,123)	(0,141)	(0,163)	(0,188)	(0,197)	(0,202)	(0,269)
Education	−0,035	−0,015	0,027	0,063	0,077	0,145	0,254	0,365	0,577	1,015**
	(0,105)	(0,224)	(0,335)	(0,388)	(0,391)	(0,366)	(0,315)	(0,337)	(0,409)	(0,459)
Lagged Central Government Debt	−0,002**	−0,004***	−0,006***	−0,006**	−0,006	−0,006	−0,004	−0,003	−0,007	−0,012*
	(0,001)	(0,002)	(0,002)	(0,003)	(0,004)	(0,004)	(0,005)	(0,005)	(0,005)	(0,006)
KOF Index	0,005	0,012	0,019	0,021	0,018	0,006	−0,010	−0,034	−0,066	−0,091*
	(0,011)	(0,023)	(0,036)	(0,045)	(0,048)	(0,051)	(0,053)	(0,052)	(0,051)	(0,047)
Ln GDP per Capita	−0,502**	−0,992**	−1,367**	−1,542***	−1,497***	−1,139	−0,255	0,481	0,759	0,761
	(0,206)	(0,412)	(0,543)	(0,554)	(0,556)	(0,767)	(1,019)	(1,286)	(1,316)	(1,153)
Expenditures	0,010**	0,018*	0,026*	0,033*	0,041**	0,043***	0,037**	0,028	0,023	0,014
	(0,004)	(0,010)	(0,015)	(0,017)	(0,017)	(0,016)	(0,015)	(0,017)	(0,019)	(0,019)

Note: *p<0,1; **p<0,05; ***p<0,01

Table 8: Budget Balance Rules Model Results for Emerging Economies

	$\Delta_h Gini_{i,t-1}$									
	h = 1	h = 2	h = 3	h = 4	h = 5	h = 6	h = 7	h = 8	h = 9	h = 10
Budget Balance Rules (Shock)	−0.006	−0.018	−0.108	−0.261	−0.331**	−0.440***	−0.513***	−0.530***	−0.556***	−0.523**
	(0.072)	(0.105)	(0.127)	(0.161)	(0.144)	(0.165)	(0.174)	(0.197)	(0.205)	(0.207)
Debt Rule	0.043	0.112	0.212	0.322	0.417*	0.469**	0.463**	0.426**	0.343*	0.290
	(0.059)	(0.118)	(0.169)	(0.210)	(0.230)	(0.226)	(0.211)	(0.202)	(0.176)	(0.181)
Revenue Rules	−0.022	−0.063	−0.125	−0.190	−0.221	−0.219	−0.174	−0.087	0.093	0.257
	(0.046)	(0.096)	(0.145)	(0.187)	(0.213)	(0.216)	(0.205)	(0.182)	(0.147)	(0.173)
Expenditure Rules	−0.082*	−0.154*	−0.246**	−0.348**	−0.389***	−0.355***	−0.306**	−0.227	−0.095	0.106
	(0.046)	(0.087)	(0.122)	(0.146)	(0.143)	(0.128)	(0.145)	(0.208)	(0.285)	(0.291)
Education	0.068	0.111	0.146	0.151	0.139	0.077	0.035	−0.013	−0.036	−0.010
	(0.045)	(0.094)	(0.155)	(0.224)	(0.301)	(0.369)	(0.419)	(0.439)	(0.448)	(0.440)
Lagged Central Government Debt	−0.001**	−0.004***	−0.008***	−0.013***	−0.016***	−0.020***	−0.024***	−0.026***	−0.030***	−0.033***
	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
KOF Index	0.002	−0.005	−0.019	−0.028	−0.030	−0.014	0.005	0.020	0.035	0.028
	(0.008)	(0.020)	(0.033)	(0.043)	(0.050)	(0.053)	(0.049)	(0.050)	(0.047)	(0.038)
Ln GDP per Capita	−0.188	−0.371	−0.554	−0.755	−0.813	−1.001	−1.293	−1.455	−1.570	−1.228
	(0.177)	(0.375)	(0.541)	(0.620)	(0.646)	(0.808)	(1.041)	(1.294)	(1.499)	(1.477)
Expenditures	0.001	0.003	0.003	0.004	0.007	0.011	0.009	0.004	−0.001	−0.011
	(0.005)	(0.010)	(0.013)	(0.015)	(0.017)	(0.021)	(0.026)	(0.030)	(0.035)	(0.036)

Note: *p<0.1; **p<0.05; ***p<0.01

6.5 Appendix E: Expenditure Rules Models Results

Table 9: Expenditure Rules Model Result for Advanced Economies

	$\Delta_h Gini_{i,t-1}$									
	h = 1	h = 2	h = 3	h = 4	h = 5	h = 6	h = 7	h = 8	h = 9	h = 10
Expenditure Rules (Shock)	0.144***	0.259***	0.283***	0.251***	0.214***	0.100	−0.033	−0.230	−0.375*	−0.421
	(0.042)	(0.050)	(0.031)	(0.049)	(0.050)	(0.091)	(0.143)	(0.210)	(0.214)	(0.316)
Debt Rule	−0.090	−0.209	−0.233	−0.018	0.353	0.852	1.165**	1.314***	1.262***	0.972***
	(0.085)	(0.202)	(0.332)	(0.458)	(0.540)	(0.580)	(0.535)	(0.482)	(0.428)	(0.366)
Revenue Rules	0.139***	0.239***	0.280**	0.310**	0.339**	0.329*	0.333*	0.362**	0.329**	0.307**
	(0.051)	(0.092)	(0.126)	(0.143)	(0.158)	(0.186)	(0.178)	(0.161)	(0.164)	(0.153)
Budget Balance Rules	0.203***	0.362***	0.374**	0.199	−0.097	−0.458	−0.681**	−0.699***	−0.530**	−0.212
	(0.057)	(0.116)	(0.181)	(0.247)	(0.292)	(0.328)	(0.311)	(0.247)	(0.223)	(0.229)
Education	0.016	0.066	0.083	0.075	0.007	−0.041	−0.012	0.145	0.400	0.855**
	(0.088)	(0.200)	(0.309)	(0.371)	(0.397)	(0.407)	(0.376)	(0.368)	(0.411)	(0.417)
Lagged Central Government Debt	−0.002**	−0.005***	−0.007***	−0.008***	−0.010***	−0.010**	−0.009**	−0.008*	−0.012**	−0.016***
	(0.001)	(0.002)	(0.002)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.006)
KOF Index	0.007	0.013	0.018	0.011	0.0004	−0.018	−0.033	−0.053	−0.080	−0.096**
	(0.011)	(0.024)	(0.035)	(0.045)	(0.049)	(0.053)	(0.054)	(0.053)	(0.051)	(0.047)
Ln GDP per Capita	−0.325	−0.644	−0.974	−1.325*	−1.593***	−1.705***	−1.273**	−0.932	−0.713	−0.404
	(0.233)	(0.501)	(0.680)	(0.700)	(0.606)	(0.513)	(0.641)	(1.027)	(1.242)	(1.331)
Expenditures	0.011**	0.020**	0.030**	0.039**	0.049***	0.053***	0.051***	0.046***	0.044***	0.034**
	(0.004)	(0.010)	(0.015)	(0.017)	(0.017)	(0.017)	(0.015)	(0.015)	(0.013)	(0.016)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 10: Expenditure Rules Model Result for Emerging Economies

	$\Delta_h Gini_{i,t-1}$									
	h = 1	h = 2	h = 3	h = 4	h = 5	h = 6	h = 7	h = 8	h = 9	h = 10
Expenditure Rules (Shock)	0.011	0.105	0.195	0.077	−0.006	−0.071	−0.145	−0.197	−0.344	−0.083
	(0.059)	(0.107)	(0.118)	(0.122)	(0.141)	(0.179)	(0.300)	(0.366)	(0.356)	(0.298)
Debt Rule	0.170***	0.373***	0.614***	0.806***	0.970***	1.070***	1.078***	1.031***	0.919***	0.827***
	(0.052)	(0.094)	(0.119)	(0.140)	(0.160)	(0.179)	(0.201)	(0.219)	(0.225)	(0.249)
Revenue Rules	0.086**	0.165*	0.222*	0.269	0.302	0.352	0.409	0.485**	0.617***	0.745***
	(0.041)	(0.087)	(0.133)	(0.168)	(0.195)	(0.233)	(0.248)	(0.240)	(0.231)	(0.211)
Budget Balance Rules	−0.295***	−0.603***	−0.922***	−1.158***	−1.308***	−1.414***	−1.433***	−1.393***	−1.320***	−1.254***
	(0.031)	(0.040)	(0.072)	(0.114)	(0.145)	(0.183)	(0.205)	(0.205)	(0.192)	(0.146)
Education	0.133***	0.240**	0.323*	0.368	0.386	0.331	0.266	0.199	0.167	0.184
	(0.049)	(0.103)	(0.175)	(0.251)	(0.335)	(0.414)	(0.471)	(0.483)	(0.476)	(0.447)
Lagged Central Government Debt	−0.001	−0.003**	−0.007***	−0.010***	−0.013***	−0.017***	−0.020***	−0.023***	−0.027***	−0.030***
	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
KOF Index	0.008	0.006	−0.003	−0.012	−0.013	0.005	0.029	0.046	0.058	0.049
	(0.007)	(0.016)	(0.028)	(0.037)	(0.045)	(0.048)	(0.045)	(0.046)	(0.045)	(0.040)
Ln GDP per Capita	−0.237	−0.470	−0.732	−0.984	−1.060	−1.203	−1.398	−1.449	−1.595	−1.424
	(0.170)	(0.358)	(0.522)	(0.608)	(0.663)	(0.814)	(1.015)	(1.211)	(1.372)	(1.330)
Expenditures	−0.004	−0.007	−0.011	−0.015	−0.013	−0.009	−0.008	−0.008	−0.010	−0.015
	(0.005)	(0.009)	(0.012)	(0.014)	(0.017)	(0.020)	(0.024)	(0.028)	(0.032)	(0.033)

Note: *p<0.1; **p<0.05; ***p<0.01

6.6 Appendix F: Revenue Rules Models Results

Table 11: Revenue Rules Model Results for Advanced Economies

	$\Delta_h Gini_{i,t-1}$									
	h = 1	h = 2	h = 3	h = 4	h = 5	h = 6	h = 7	h = 8	h = 9	h = 10
Revenue Rules (Shock)	0.129**	0.289**	0.296*	0.280	0.378*	0.492***	0.415**	0.431***	0.405**	0.390**
	(0.052)	(0.128)	(0.158)	(0.197)	(0.197)	(0.175)	(0.167)	(0.158)	(0.164)	(0.166)
Debt Rule	−0.058	−0.112	−0.052	0.226	0.661	1.207**	1.531***	1.632***	1.509***	1.178***
	(0.095)	(0.218)	(0.354)	(0.469)	(0.537)	(0.582)	(0.541)	(0.481)	(0.433)	(0.387)
Budget Balance Rules	0.200***	0.348***	0.354*	0.176	−0.124	−0.483*	−0.688***	−0.684***	−0.488**	−0.163
	(0.062)	(0.124)	(0.185)	(0.241)	(0.267)	(0.288)	(0.262)	(0.203)	(0.204)	(0.235)
Expenditure Rules	0.0004	−0.061	−0.187**	−0.349***	−0.503***	−0.662***	−0.792***	−0.862***	−0.899***	−0.853***
	(0.022)	(0.046)	(0.087)	(0.120)	(0.136)	(0.157)	(0.189)	(0.217)	(0.226)	(0.282)
Education	−0.008	0.031	0.059	0.048	−0.025	−0.062	−0.007	0.087	0.334	0.825
	(0.094)	(0.209)	(0.316)	(0.366)	(0.374)	(0.357)	(0.345)	(0.403)	(0.477)	(0.519)
Lagged Central Government Debt	−0.002**	−0.004***	−0.005***	−0.006**	−0.006	−0.005	−0.004	−0.003	−0.007	−0.012**
	(0.001)	(0.002)	(0.002)	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.006)
KOF Index	0.008	0.015	0.023	0.022	0.015	−0.003	−0.021	−0.045	−0.074	−0.093**
	(0.011)	(0.024)	(0.036)	(0.044)	(0.048)	(0.050)	(0.051)	(0.051)	(0.050)	(0.047)
Ln GDP per Capita	−0.367	−0.750	−1.127	−1.484**	−1.780***	−1.895***	−1.328**	−0.719	−0.235	0.152
	(0.262)	(0.548)	(0.734)	(0.743)	(0.590)	(0.442)	(0.636)	(1.001)	(1.142)	(1.200)
Expenditures	0.011**	0.019*	0.027*	0.034*	0.041**	0.042**	0.036**	0.028*	0.024	0.017
	(0.004)	(0.010)	(0.016)	(0.018)	(0.018)	(0.017)	(0.015)	(0.017)	(0.018)	(0.018)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 12: Revenue Rules Model Results for Emerging Economies

	$\Delta_h Gini_{i,t-1}$									
	h = 1	h = 2	h = 3	h = 4	h = 5	h = 6	h = 7	h = 8	h = 9	h = 10
Revenue Rules (Shock)	−0.021	−0.052	0.019	0.050	0.033	0.068	0.026	−0.042	0.073	0.095
	(0.061)	(0.100)	(0.166)	(0.226)	(0.278)	(0.331)	(0.337)	(0.320)	(0.336)	(0.357)
Debt Rule	0.181***	0.397***	0.642***	0.842***	1.016***	1.125***	1.143***	1.119***	1.037***	0.989***
	(0.053)	(0.094)	(0.124)	(0.146)	(0.166)	(0.179)	(0.193)	(0.203)	(0.205)	(0.217)
Budget Balance Rules	−0.286***	−0.582***	−0.889***	−1.121***	−1.270***	−1.379***	−1.395***	−1.355***	−1.286***	−1.225***
	(0.032)	(0.036)	(0.061)	(0.102)	(0.129)	(0.167)	(0.190)	(0.196)	(0.189)	(0.159)
Expenditure Rules	−0.051	−0.087	−0.138	−0.210*	−0.238**	−0.204**	−0.136	−0.025	0.120	0.348
	(0.048)	(0.081)	(0.102)	(0.119)	(0.109)	(0.087)	(0.113)	(0.166)	(0.232)	(0.237)
Education	0.116**	0.205**	0.275*	0.313	0.332	0.275	0.203	0.112	0.048	0.044
	(0.046)	(0.098)	(0.164)	(0.235)	(0.313)	(0.380)	(0.424)	(0.433)	(0.428)	(0.406)
Lagged Central Government Debt	−0.001	−0.003**	−0.007***	−0.010***	−0.013***	−0.017***	−0.021***	−0.023***	−0.028***	−0.031***
	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
KOF Index	0.008	0.006	−0.003	−0.013	−0.015	0.001	0.024	0.041	0.053	0.046
	(0.007)	(0.016)	(0.027)	(0.036)	(0.043)	(0.047)	(0.044)	(0.045)	(0.041)	(0.035)
Ln GDP per Capita	−0.243	−0.486	−0.760	−1.015*	−1.091*	−1.250*	−1.490	−1.590	−1.817	−1.634
	(0.163)	(0.341)	(0.496)	(0.567)	(0.602)	(0.736)	(0.931)	(1.145)	(1.322)	(1.288)
Expenditures	−0.003	−0.005	−0.009	−0.011	−0.009	−0.006	−0.006	−0.007	−0.012	−0.018
	(0.005)	(0.009)	(0.013)	(0.014)	(0.016)	(0.020)	(0.025)	(0.029)	(0.035)	(0.035)

Note: *p<0.1; **p<0.05; ***p<0.01

6.7 Appendix G: Database Descriptive Statistics

Table 13: Description of Advanced Economies Variables

Variable	**Mín.**	**1st Quartile**	**Median**	**Average**	**Maximum**	**3rd Quartile**
Expenditure Rules	0.00	0.00	0.00	0.45	1.00	1.00
Revenue Rules	0.00	0.00	0.00	0.07	1.00	0.00
Budget Balance Rules	0.00	1.00	1.00	0.84	1.00	1.00
Debt Rule	0.00	0.00	1.00	0.66	1.00	1.00
Gini Index	22.00	26.50	29.90	29.92	39.30	32.90
Central Government Debt (% GDP)	0.82	28.45	48.72	57.13	199.91	80.48
Education (Years of Schooling)	6.66	10.53	11.46	11.32	13.30	12.48
KOF Index	48.39	75.58	80.70	79.33	90.81	85.06
Expenditures (% GDP)	24.26	39.24	44.75	44.71	66.82	49.90
GDP per Capita (Millions of USD)	8969.00	28946.00	38593.00	40115.00	96812.00	46632.00

Table 14: Description of Emerging Economies Variables

Variable	**Minimum**	**1st Quartile**	**Median**	**Average**	**Maximum**	**3rd Quartile**
Expenditure Rules	0.00	0.00	0.00	0.15	1.00	0.00
Revenue Rules	0.00	0.00	0.00	0.11	1.00	0.00
Budget Balance Rules	0.00	0.00	1.00	0.52	1.00	1.00
Debt Rule	0.00	0.00	1.00	0.45	1.00	1.00
Gini Index	23.70	38.00	42.10	42.21	67.10	46.40
Central Government Debt (% GDP)	0.29	26.44	42.69	52.01	658.22	64.11
Education (Years of Schooling)	0.66	4.58	6.89	6.71	11.75	8.72
KOF Index	22.47	43.70	52.18	52.66	85.40	61.63
Expenditures (% GDP)	5.40	18.74	25.03	26.06	141.50	32.00
GDP per Capita (Million of USD)	289.20	2989.40	7985.00	11510.90	120747.90	13577.00