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Income Inequality and Fiscal Policy over the Political Cycle A Panel Estimation Model for Emerging Markets and Developing Economies

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A Panel Estimation Model for Emerging Markets and Developing Economies[1]

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Abstract

We assess the fiscal policy responses of Emerging Markets and Developing Economies governments to unexpected shocks that increase income inequality. We focus on the relationship between income inequality and public expenditure, progressive taxation, and public debt. We aim particularly on the strategic use of public debt to finance greater public expenditure targeted to lessen the negative effects of hikes in income inequality. To this end, we exploit the fact that a government that wants to be reelected will try to avoid social conflict and class struggle related to increases in income inequality. Thus, it is expected that increasing social inequalities induce more political pressures the closer the next executive election is. We estimate dynamic panel models for 49 Emerging Markets and Developing Economies with annual data for the 1990-2015 period. We find that the marginal effect of inequality on the public debt is increasing in the share of the executive term completed, and it becomes statistically significant after completing 85% of the corresponding term. This finding is robust to different empirical specifications and is more pronounced in Latin American Countries and for economies with higher external liabilities. The interaction term is not statistically significant in the other three cases (government consumption, progressive taxation, and the primary balance), which suggests that the relationship between income inequality and these variables is not mediated by the political cycle. However, there is a statistically significant and negative (positive) linear effect on income inequality on the government consumption (primary balance).

Keywords: Income Inequality, Fiscal Policy, Panel Data Models.

JEL: D31, E62, C33.

[1] The usual disclaimer applies.

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Desigualdad de Ingresos y Política Fiscal a lo largo del Ciclo Político
Estimaciones de Datos en Panel para Economías Emergentes y en Desarrollo

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Resumen

Evaluamos las respuestas de política fiscal de los gobiernos en mercados emergentes y economías en desarrollo (EEDs) a los choques inesperados que aumentan la desigualdad de ingresos. Nos focalizamos en la relación entre la desigualdad de ingresos y el gasto público, la tributación progresiva y la deuda pública. Analizamos particularmente el uso estratégico de la deuda pública para financiar un mayor gasto público dirigido a atenuar los efectos negativos de los aumentos en la desigualdad de ingresos mediante la estimación de modelos de panel dinámicos para 49 Economías Emergentes y en Desarrollo con datos anuales para el período 1990-2015. Se espera que el aumento de la desigualdad de ingresos intensifique las presiones políticas cuanto más cerca esté la próxima elección ejecutiva. Encontramos que para estas economías la interacción entre el ciclo político —tiempo restante para completar el mandato electoral— y la desigualdad de ingresos es significativa y está relacionada positivamente con la deuda pública. El efecto marginal de la desigualdad sobre la deuda pública se incrementa a medida que se cumple el mandato electoral, y se vuelve estadísticamente significativo después de completar el 85% del mismo. Este hallazgo es robusto a diferentes especificaciones empíricas y es más pronunciado en los países de América Latina y en las economías con mayores pasivos externos. El término de interacción no es estadísticamente significativo en los otros tres casos (consumo público, tributación progresiva y saldo primario), lo que sugiere que la relación entre la desigualdad de ingresos y estas variables no está mediada por el ciclo político. Sin embargo, existe un efecto lineal estadísticamente significativo y negativo (positivo) entre la desigualdad de ingresos y el consumo del gobierno (resultado fiscal primario).

Palabras clave: Desigualdad de Ingresos, Política Fiscal, Modelos de Datos en Panel.

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Income Inequality and Fiscal Policy over the Political Cycle

A Panel Estimation Model for Emerging Markets and Developing Economies

Introduction

Standard measures of within-country income inequality, such as the Gini coefficient or the share of income accruing to the top 10% of earners, have trended up globally from the 1980s (BIS Annual Economic Report 2021: 41). Regarding the OECD Economic Outlook (2021), the World Bank Global Economic Prospects (2021), and the IMF Outlook for Latin American and the Caribbean (2021), income inequality is expected to grow from an already high level before the COVID-19 crisis. According to the IMF's inequality projected increases for different regions, these tendencies will be greater in Latin American Countries (LACs) than in other Emerging Markets and Developing Economies (EMDEs).

In the present paper, we assess the different fiscal policy responses of EMDEs governments to unexpected shocks that increase income inequality. Fiscal policy reactions are limited to choose among a set of options. To lessen income inequality, EMDEs governments have to decide among a constrained fiscal policy mix. We particularly focus on the relationship between income inequality and 1) public expenditure; 2) progressive taxation, and 3) public debt.

According to 1), public expenditure is an effective tool to reduce income disparities, mainly when it is focused on social and infrastructure items, and there exist incentives to use government spending before the elections to increase the probability of political permanency. Concerning 2), progressive taxation negatively correlates with income inequality, both in advanced and developing economies. Most of the time it is difficult to implement this alternative because of the resistance of the high-income taxpayers. Moreover, it can have negative effects on elections. Relating 3), there exist economic and political motivations for using public debt to reduce income inequality through the financing of greater fiscal needs.

We find that for EMDEs the interaction between the political cycle —proxied by the remaining time to complete the mandate— and income inequality is significant and positively related only to public debt. The marginal effect of inequality on the public debt is increasing in the share of the executive term completed, and it becomes statistically significant after completing 85% of the corresponding term. Our empirical approach takes some arguments from Political Economy contributions to prove that policy makers frequently opt for using public debt to face unexpected shocks that increase income inequality and maximizing their chances of being reelected. The interaction term is not statistically significant in the other three fiscal policy alternatives (government consumption, progressive taxation, and the primary balance), which suggests that the relationship between income inequality and these variables is not mediated by the political

cycle. However, there is a statistically significant and negative (positive) linear effect on income inequality on the government consumption (primary balance).

According to our robustness checks, the marginal effect of the Top 1% on the PD is increasing in the share of the executive term completed, and it becomes statistically significant after completing around 15% of the corresponding term. The marginal effect of the unemployment rate on the PD is also increasing in the share of the executive term completed, and it becomes statistically significant after completing around 20% of the corresponding term.

Regarding the existence of heterogeneous effects, the political cycle mediated effect that we have seen in the baseline estimates takes place where the external position of the whole country is increasingly negative. However, at higher levels of NFA the marginal effect of income inequality on the PD, although statistically significant, does not depend on the political cycle. The effect on the PD that we have seen in the baseline estimates is evidenced for LAC countries, whereas it is not statistically significant for Non-LAC countries. We also tested if this effect is more pronounced in the case of the Public External Debt (PED). We realize a positive effect of inequality on the PED, but it is not mediated by the political cycle.

The remainder of the paper proceeds as follows. Section II presents the theoretical framework, explaining the motivation and providing a review of the literature on income inequality and different fiscal policy responses. Section III describes the empirical strategy and shows our main empirical findings. Section IV shows the sensibility of these empirical findings to different robustness checks. Section V examines some empirical heterogeneous effects of income inequality, political cycle and our constrained fiscal policy mix, with an emphasis on the degree of openness in the financial account and to LACs countries. Section VI concludes the chapter.

II. Theoretical framework

II.1 Motivation

To fully appreciate our problem, we assume that an initial unexpected shock increases income inequality and a "non-Ricardian" government with a relatively high intertemporal discount rate.[8] In such a case, the growing social conflict will negatively affect the governments' probability of reelection. From a macroeconomic point of view, consumption will fall due to the lower marginal

[8] Theoretically, different political factors imply that a government behaves similarly to an agent with present-biased and dynamically inconsistent preferences (Yared, 2018). An analytically tractable representation of such preferences is the quasi-hyperbolic case analyzed in Laibson (1997). The study of these political factors is beyond the scope of this chapter.

propensities to consume of lowest deciles *vis-à-vis* the highest ones. Under certain conditions, savings and investment will increase but never in a sufficient way to compensate for the fall in aggregate consumption. The decrease in consumption will reduce tax collection. If there is not an adjustment of fiscal expenditure, the fiscal deficit will most likely rise.

Thus, policymakers will face a trade-off of falling tax revenues and increasing social demands for higher public expenditures. If they focus on their political permanency, they will be tempted to expand public expenditures. If governments use greater progressive taxation, this alternative could negatively affect their electoral base, given that high-income groups will face greater tax pressures and eventually decide to vote for other political alternatives.

Recent evidence suggests that public debt and income inequality have risen with financial globalization. Henceforth, governments can choose higher levels of public debt when domestic financial markets become deeper and, particularly, when the country becomes internationally integrated and income inequality increases. International tax arbitrage issues linked to greater financial openness restrict the ability to tax top incomes.[9] In addition, the effectiveness of progressive taxation in reducing inequality in EMDEs is limited by several factors such as the low average tax revenue as a percentage of GDP, the relatively high contribution of indirect taxes, the inability to tax top incomes, the elevated labor market informality, and the limited institutional capacity.

Although we empirically consider the different governments' responses according to our constrained fiscal policy mix, we focus particularly on the strategic use of public debt to finance greater public expenditure targeted to lessen the negative effects of hikes in income inequality. We contribute to the literature by empirically showing that in EMDEs governments prefer this option when considering that preserving social and political stability enhances their chances of permanency in charge.

II.2 Related literature

The association between income inequality and public expenditure has been analyzed by Brender and Drazen (2008), Shi and Svensson (2006), Tabellini and Alesina (1990), Aghion and Bolton (1989), Persson and Svensson (1989). These contributions confirm that governments have

[9] In small open financial economies, alternative 2) has limitations due to international arbitrage reasons. Relating to the increasing capital and asset mobility such as intellectual property, as well as of the new business models of the century XXI, Base Erosion and Tax Shifting (BEPS) has become a serious problem. In fact, the OECD Action BEPS refers to base erosion taxable and the transfer of profits caused by the existence of gaps or unwanted mechanisms between the different national tax systems of which multinational companies can be served, in order to make disappear benefits for tax purposes or to transfer benefits to locations where there is little or no real activity, although it enjoys a weak imposition, resulting in little or null income on companies.

incentives to increase public expenditure before the elections to raise their reelection probabilities. This result applies in presence of fiscal illusion or naïve voters' expectations (Nordhaus, 1975 and 1989), or in the context of rational expectations voters that face informational asymmetries about the incumbent government skills (Brender and Drazen, 2008; Shi and Svensson, 2006; Persson and Tabellini, 2000; Rogoff, 1990; Rogoff and Sibert, 1988).

Using newly assembled data on spending composition for 83 countries across all income groups, Doumbia and Kinda (2019) provide empirical support that reallocating spending toward social protection and public infrastructure is associated with income inequality drops. A recent survey by Anderson et al. (2017) identifies 84 studies containing over 900 estimations. This meta-analysis shows some evidence of a moderate, negative relationship between government spending and income inequality, which is stronger for social welfare and other social spending. Muinelo-Gallo and Roca-Sagalés (2011) study the impact of public expenditure and investment on income inequality in 43 middle and high-income economies from 1972 to 2006. Their analysis uncovers equalizing effects of both government expenditure and public investment.

The link between income inequality and progressive taxation has been studied by Alesina and Passalacqua (2016), Hager (2016), Röhrs and Winter (2014), and Meltzer and Richard (1981). These contributions show that income inequality reduces with the progressivity of the income tax structure (Alesina and Passalacqua, 2016; Hager, 2016), policymakers reduce the negative effects of borrowing constraints on the private sector improving the progressive of tax systems (Röhrs and Winter, 2014), and tax progressivity enhance when the distance between the median voter and the rest of voters declines (Meltzer and Richard, 1981).

Martorano (2016) confirms that for the 2000s the increasing contribution of direct taxes in LACs concerning indirect taxes supported the progressivity of the tax system and contributed to the reduction of income inequality. Muinello-Gallo and Roca-Sagalés (2013) estimate an unbalanced panel data of 21 high-income OECD countries during the period 1972-2006 to reveal that direct taxes generate sizable reductions in income inequality. Using several unique measures of progressivity over the 1981-2005 period for a large panel of countries, Duncan and Peter (2012) also find that tax progressivity reduces income disparities. Hollar and Cubero (2010) surveyed the available evidence on the structure of taxes by income quintiles in Central American countries, finding that the distributional effect of taxation is regressive but small.

Last, but not least, the relationship between income inequality and public debt has been examined by Carrera and de la Vega (2021), Yared (2018), Alesina and Passalacqua (2016), Hager (2016), Azzimonti et al. (2014), Röhrs and Winter (2014), and Persson and Tabellini (2000), who indicate that: An incumbent government can also use the debt level to enhance its reelection probability (p. 345) […] The party deciding on public policy in the current period is aware that with some

probability it will not hold office in the next period. This may induce too much borrowing because the costs in terms of future spending cuts are not fully internalized. An incumbent government may also want to choose debt issues strategically for another reason, however, namely, to influence its likelihood of reelection, and relates to a key empirical stylized fact: greater political instability should be associated with a more volatile public debt policy (p. 356).

Aksman (2017) investigates the hypothesis that countries with the highest levels of income inequality are the most indebted because they have higher social spending to face this problem. He finds that income inequality is not a statistically significant predictor of the public debt-to-GDP ratio. Davtyan (2014) points out that economic recessions accompanied by greater inequality can generate political pressures, which induce large discretionary public expenditures. Azzimonti et al. (2014) show that governments choose higher levels of public debt if financial markets are internationally integrated and income inequality increases. Arawatari and Onoz (2015) show that when the elasticity of intertemporal substitution is less than one, a country with low inequality pursues a strict fiscal policy with a small increase in public debt, while a country with high inequality experiences a policy fiscal lax with a large public debt. Jabłoński (2013) reports that an increase in income inequality led to an increase in public debt in OECD countries in the period 1995-2010. Larch (2012) shows that countries with greater inequality have large deficits and tend to accumulate large public debt. Song et al. (2012) present a two-period overlapping-generations model with small open countries that differ in their public goods preferences. Each country decides its public goods provision financed by taxes and public debt through probabilistic voting, reflecting the conflicting preferences of two successive generations. The prediction of this model is consistent with the empirical evidence from OECD countries for the past three decades.

III. Data sources, empirical strategy, and results

The empirical strategy aims to evaluate the hypothesis that a government that wants to be reelected will try to avoid social conflict and class struggle related to increases in income inequality. Thus, it is expected that increasing social inequalities induce more political pressures the closer the next executive election is. The goal is to capture to which extent governments have incentives to use public debt (PD) instead of other fiscal policy alternatives to lessen income inequality increases. To this end, we estimate the impact of income inequality on different fiscal policy options:

$$y_{i,t} = \beta_0 + \beta_1 y_{i,t-1} + \beta_2 INEQ_{i,t} + \beta_3 shr\_term_{i,t} + \beta_4 INEQ_{i,t} * shr\_term_{i,t} + X_{i,t}\gamma + \mu_i + \tau_t + \varepsilon_{i.t} \quad (1)$$

where $y_{i,t}$ is certain fiscal policy variable (PD, government final consumption expenditure, progressive taxation, and fiscal primary balance) in country i in and period t; $INEQ$ is the income inequality measured by the Gini coefficient (pre-tax, pre-transfer), and shr_term is the share of the executive term completed. $X_{i,t}$ is a vector of control variables, μ_i is a country-specific fixed effect that captures all country-specific time-invariant determinants, τ_t is a time fixed effect that captures the influences of global shocks like those in international liquidity, and $\varepsilon_{i.t}$ is the error term.

The main variable of interest is $INEQ$ and its interaction with shr_term. For example, take the case where $y_{i,t}$ refers to the PD. Then β_4 is expected to be positive, suggesting that an increasing income inequality induces governments to issue more PD, and this effect is higher the closer the next executive election is.

The variable shr_term is constructed by using the information on the years left in current term in the Database of Political Institutions [DPI] (Cruz et al., 2021). Using that variable, we estimate the length of each executive term and then the proportion of the executive term completed as follows: $shr\_term = 1 - \frac{years\ left\ in\ current\ term}{term\ length}$. We drop the country-year observations with systems with unelected executives and those without a finite term in office. The dataset comprises annual data for 49 economies across the 1990-2015 period.[10]

We include a large set of control variables in order to isolate the effect of income inequality on our constrained fiscal policy mix. This set of control variables does not only include standard determinants taken from the literature but also new potential determinants, which are listed in Table 1 in the Appendix A with the source of information.

IV. Results

The complete results of estimating equation (1) by Fixed Effects and Least Square Dummy Variables (LSDV-Kiviet) are presented in Table 1 in Appendix B. We find that the interaction coefficient is only statistically significant in the case where the dependent variable is the PD,

[10] The countries included are listed below:

East Asia and Pacific (3): Indonesia, Malaysia, Mongolia.

Europe and Central Asia (8): Armenia, Bulgaria, Croatia, Georgia, Hungary, Poland, Romania, Russia.

Latin America and Caribbean (12): Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Jamaica, Mexico, Panama, Paraguay, Peru, Uruguay.

Middle East and North Africa (1): Iran.

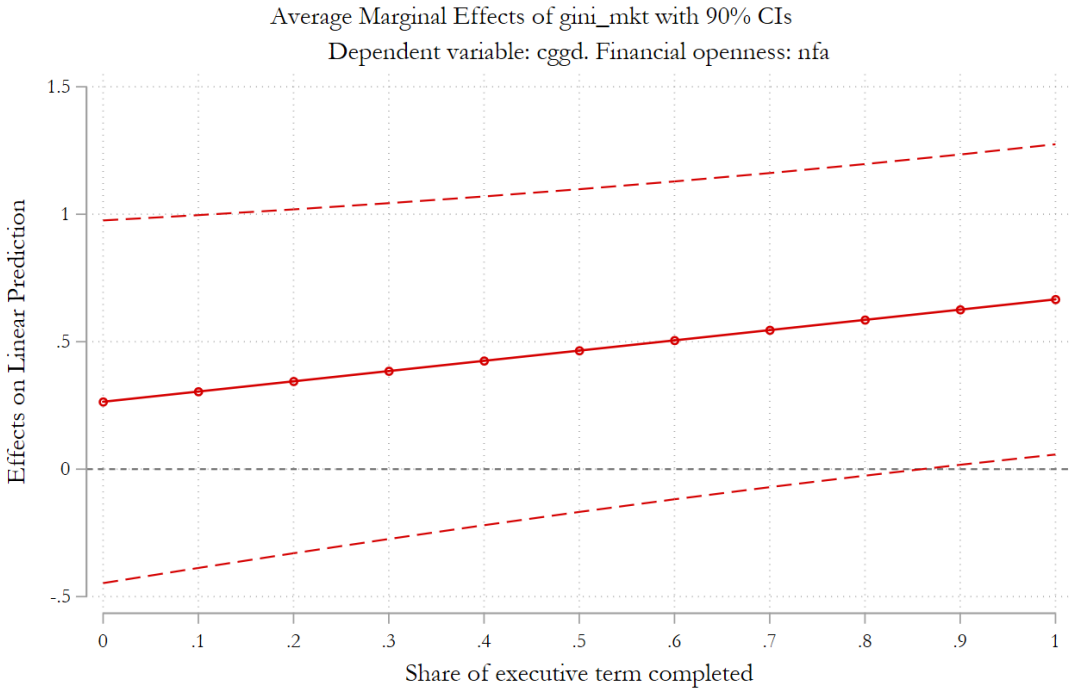
South Asia (3): India, Pakistan, Sri Lanka.

Sub-Saharan Africa (22): Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Chad, Côte d'Ivoire, Gabon, Guinea-Bissau, Kenya, Liberia, Mali, Mauritius, Namibia, Niger, Nigeria, Rwanda, Senegal, Tanzania, Togo, Uganda.

although the linear term of the Gini coefficient is not statistically significant. The conjunction of these two terms gives the marginal effect that is plotted in the Panel A of Figure 1.[11] The marginal effect of inequality on the PD is increasing in the share of the executive term completed, and it becomes statistically significant after completing 85% of the corresponding term.

We find that the interaction term is not statistically significant in the other three cases (government consumption, progressive taxation, and the primary balance), which suggests that the relationship between income inequality and those variables is not mediated by the political cycle. However, there is a statistically significant and negative (positive) linear effect on income inequality on the government consumption (primary balance).

Figure 1. Marginal Effects of Inequality on the PD



Author's elaboration. The figure plots the marginal effect of the Gini coefficient on the PD in terms of the share of the executive term completed. Dotted lines are confident intervals at 90% of significance.

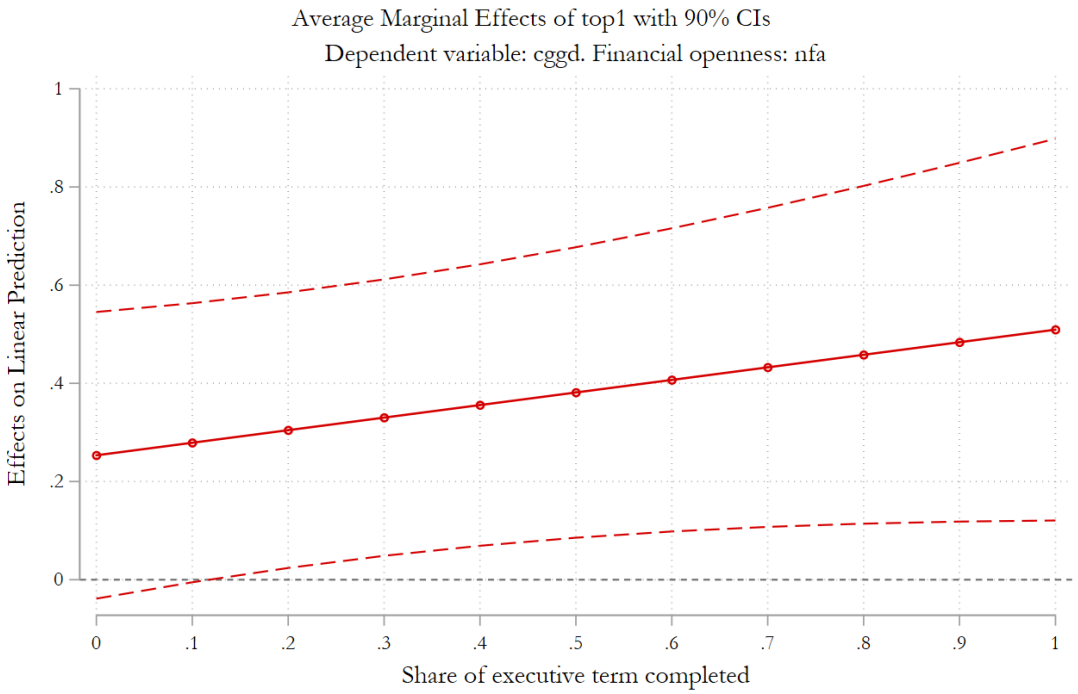
V. Robustness checks

In recent years, the upper percentiles of the income distribution have generally been used as an alternative measurement of income inequality. Various authors have remarked that the high concentration of national income in the upper extreme of the distribution defines a new phase of

[11] Intuitively, if the confidence interval (dotted lines) includes the zero (vertical axis), the marginal effect is not statistically significant. On the other hand, the slope of the solid curve indicates the magnitude of the interaction coefficient.

modern capitalism (Piketty and Saez, 2006; Alvaredo et al., 2013; Piketty, 2014). Therefore, as a robustness check, we present our estimates substituting the Gini coefficient with the Top 1%. As we illustrate in Figure 2, the marginal effect of the Top 1% on the PD is increasing in the share of the executive term completed, and it becomes statistically significant after completing around 15% of the corresponding term.

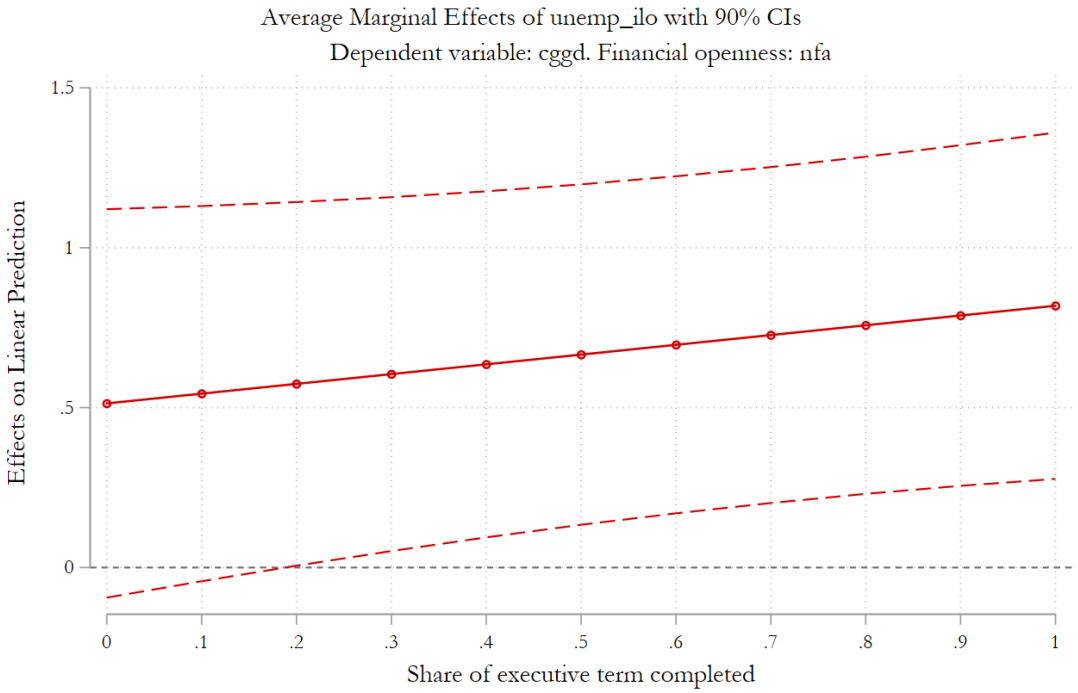
Figure 2. Marginal Effects of Top Incomes on the PD



Author's elaboration. The figure plots the marginal effect of the Top 1% on the PD in terms of the share of the executive term completed. Dotted lines are confident intervals at 90% of significance.

Government policies aimed at addressing social problems tend to be guided by a more direct variable within voters' perception and possible experiences, such as the unemployment rate, which is a more direct indicator of social unrest and political instability. In that regard, as another robustness test, we performed our baseline regression substituting the Gini coefficient for the unemployment rate. The marginal effect of the unemployment rate on the PD is also increasing in the share of the executive term completed, and it becomes statistically significant after completing around 20% of the corresponding term (see Figure 3).

Figure 3. Marginal Effects of Unemployment on the PD



Author's elaboration. The figure plots the marginal effect of the Unemployment rate on the PD in terms of the share of the executive term completed. Dotted lines are confident intervals at 90% of significance.

V. Heterogeneous effects

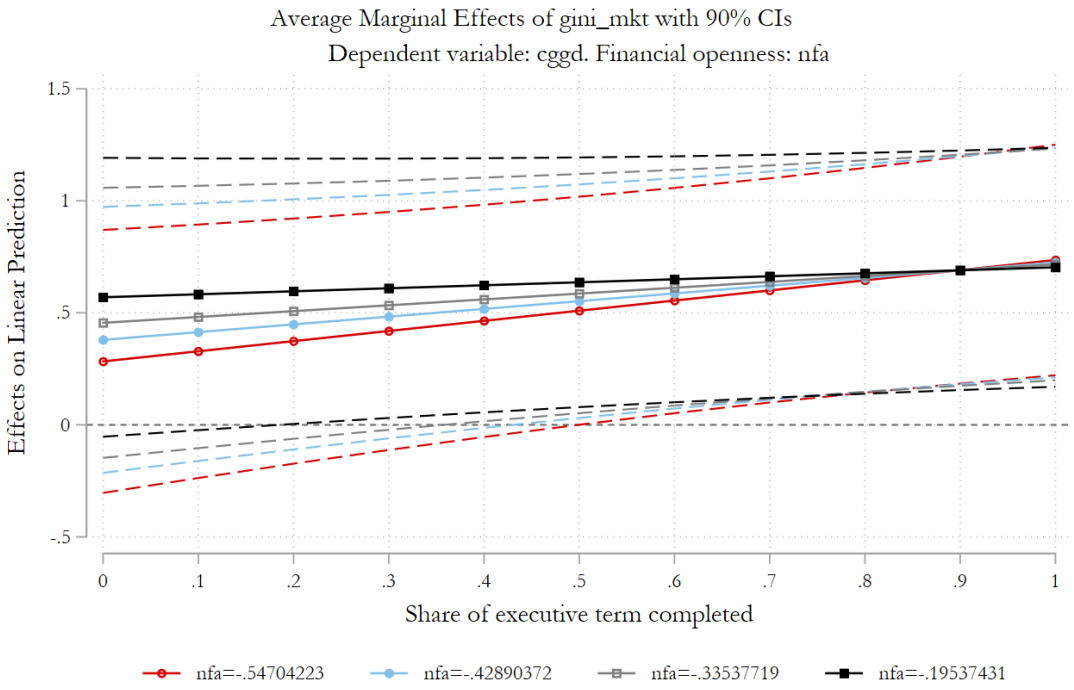
V.1 Openness of the Financial Account

To explore if our results vary for different levels of openness financial account, proxied by Net Foreign Assets (NFA), we consider an alternative specification with a three-way interaction:

$$y_{i,t} = \beta_0 + \beta_1 y_{i,t-1} + \beta_2 INEQ_{i,t} + \beta_3 shr\_term_{i,t} + \beta_4 INEQ_{i,t} * shr\_term_{i,t} + \beta_5 INEQ_{i,t} * NFA_{i,t} + \beta_6 shr\_term_{i,t} * NFA_{i,t} + \beta_7 INEQ_{i,t} * shr\_term_{i,t} * NFA_{i,t} + X_{i,t}\gamma + \mu_i + \tau_t + \varepsilon_{i.t} \quad (2)$$

The political-cycle-mediated effect that we have seen in the baseline estimates (Figure 1) takes place where the external position of the whole country is increasingly negative (see Figure 4). However, at higher levels of NFA the marginal effect of income inequality on the PD, although statistically significant, does not depend on the political cycle.

Figure 4. Marginal Effects of Inequality on the PD for different degrees of financial account openness



Author's elaboration. The figure plots the marginal effect of the Gini coefficient on the PD in terms of the share of the executive term completed for different values of the NFA. Dotted lines are confident intervals at 90% of significance.

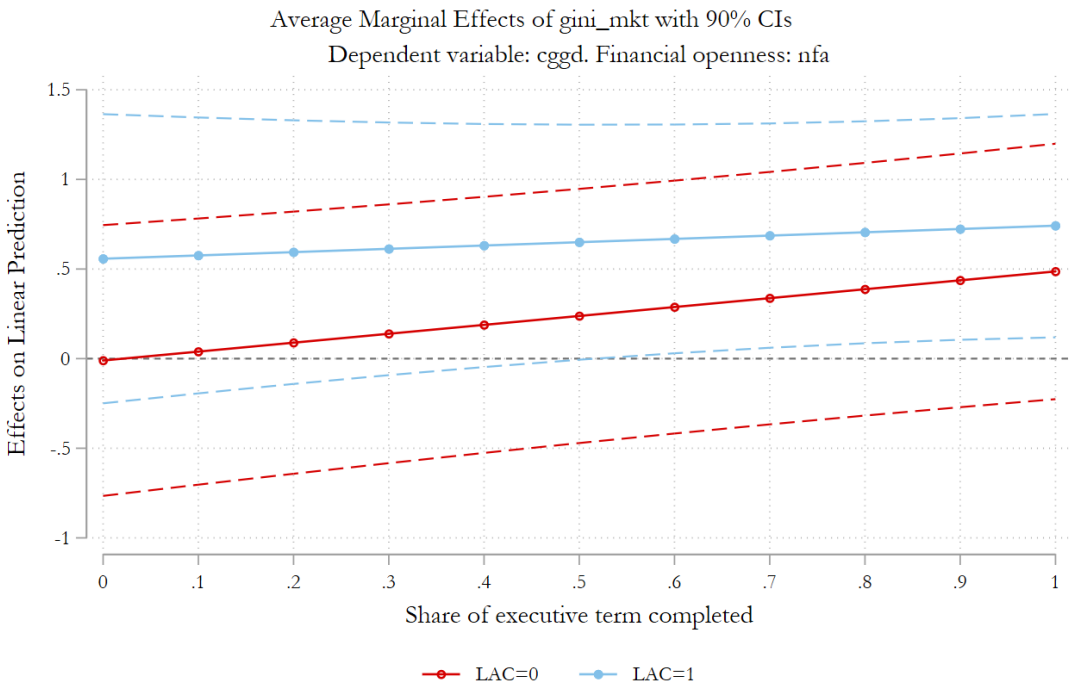
V.2 LAC vs Non-LAC countries

To explore if our results differ for LACs countries, we consider an alternative specification with a three-way interaction:

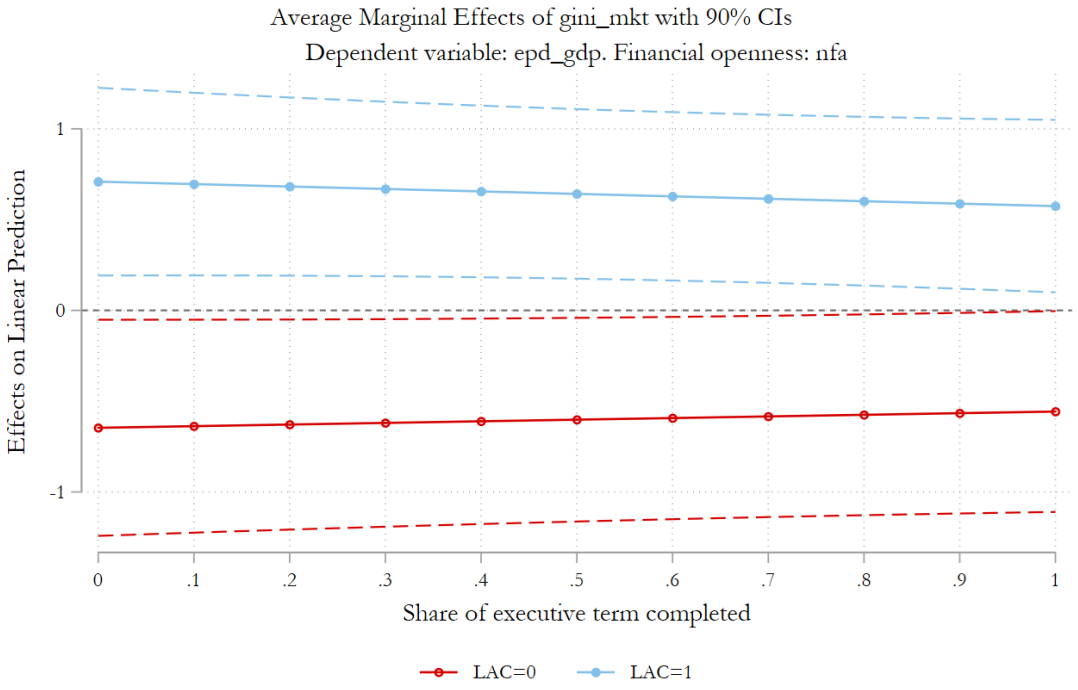
$$y_{i,t} = \beta_0 + \beta_1 y_{i,t-1} + \beta_2 INEQ_{i,t} + \beta_3 shr\_term_{i,t} + \beta_4 INEQ_{i,t} * shr\_term_{i,t} + \beta_5 INEQ_{i,t} * LAC + \beta_6 shrterm_{i,t} * LAC + \beta_7 INEQ_{i,t} * shr\_term_{i,t} * LAC + X_{i,t}\gamma + \mu_i + \tau_t + \varepsilon_{i.t} \quad (3)$$

As shown in the Panel A of Figure 5, the effect on the PD that we have seen in the baseline estimates (Figure 1) is evidenced for LAC countries, whereas it is not statistically significant for Non-LAC countries. In Panel B of Figure 5, we also analyze if this effect is more pronounced in the case of the Public External Debt (PED). We find a positive effect of inequality on the PED, but it is not mediated by the political cycle.

Figure 5. Marginal Effects of Inequality on the PD for different degrees of financial account openness
LAC vs Non-LAC countries
Panel A: PD (Central government debt, % GDP)



Panel B: PED (% GDP)



Author's elaboration. The figure plots the marginal effect of the Gini coefficient on the PD (Panel A) and on the PED (Panel B) in terms of the share of the executive term completed for different subsamples of countries. LAC=1 refers to LAC countries while LAC=0 to Non-LAC countries. Dotted lines are confident intervals at 90% of significance.

VI. Conclusions

We assess the different fiscal policy responses of EMDEs governments to unexpected shocks that increase income inequality. Fiscal policy reactions are limited to choose among a set of options. To lessen income inequality, EMDEs governments have to decide among a constrained fiscal policy mix. We particularly focus on the relationship between income inequality and 1) public expenditure; 2) progressive taxation, and 3) public debt. We focus particularly on the strategic use of public debt to finance greater public expenditure targeted to lessen the negative effects of hikes in income inequality. We contribute to the literature by empirically showing that in EMDEs governments prefer this option when considering that preserving social and political stability enhances their chances of permanency in charge.

We find that for EMDEs the interaction between the political cycle —proxied by the remaining time to complete the mandate— and income inequality is significant and positively related only to public debt. The marginal effect of inequality on the public debt is increasing in the share of the executive term completed, and it becomes statistically significant after completing 85% of the corresponding term. Our empirical approach takes some arguments from Political Economy contributions to prove that policy makers frequently opt for using public debt to face unexpected shocks that increase income inequality and maximizing their chances of being reelected. The interaction term is not statistically significant in the other three fiscal policy alternatives (government consumption, progressive taxation, and the primary balance), which suggests that the relationship between income inequality and these variables is not mediated by the political cycle. However, there is a statistically significant and negative (positive) linear effect on income inequality on the government consumption (primary balance).

According to our robustness checks, the marginal effect of the Top 1% on the PD is increasing in the share of the executive term completed, and it becomes statistically significant after completing around 15% of the corresponding term. The marginal effect of the unemployment rate on the PD is also increasing in the share of the executive term completed, and it becomes statistically significant after completing around 20% of the corresponding term.

Regarding the existence of heterogeneous effects, the political cycle mediated effect that we have seen in the baseline estimates takes place where the external position of the whole country is increasingly negative. However, at higher levels of NFA the marginal effect of income inequality on the PD, although statistically significant, does not depend on the political cycle. The effect on the PD that we have seen in the baseline estimates is evidenced for LAC countries, whereas it is not statistically significant for Non-LAC countries. We also tested if this effect is more

pronounced in the case of the Public External Debt (PED). We realize a positive effect of inequality on the PED, but it is not mediated by the political cycle.

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Appendix A. Variables and Sources

Table A1. Variables and Sources

Name	Description	Source
Public Debt	Total stock of debt liabilities issued by the central government as a share of GDP	Global Debt Database (IMF)
Primary Fiscal Balance (% GDP)	General government primary net lending/borrowing	IMF WEO
Real GDP Growth (annual %)	Annual percentage growth rate of GDP at market prices based on constant local currency	World Bank WDI
Log of GDP per capita	GDP per capita based on purchasing power parity (PPP) (constant 2017 international $)	World Bank WDI
Log of Terms of Trade	Net barter terms of trade index	World Bank WDI
Inflation	Inflation, consumer prices (annual %). As it is usual in the literature, we use the transformation: ln(1 + inflation/100)	World Bank WDI
Credit to the Private Sector (% GDP)	As a proxy for the size of the domestic financial market	World Bank
Fiscal Rules	We include categorical variables that indicate the presence of four types of fiscal rules: balanced budget rules, debt rules, expenditure rules and revenue rules, which apply to the central or general government or the public sector	IMF Fiscal Rules Dataset, 2016

Institutions (Constraints on the Executive)	We use a measurement of the institutionalized constraints on the decision-making powers of chief executives, whether individuals or collectivities. This variable contains a seven-category scale ranging from the most authoritarian regimes up to those that have the most exhaustive mechanism of control on the executive powers. We grouped these categories into four categories to facilitate the analysis	Polity IV dataset
Old Dependency Ratio	Age dependency ratio, old (% of working-age population)	World Bank WDI
de facto Capital Account Openness	Net Foreign Asset Position (NFA) (% GDP)	Lane and Milesi-Ferretti (2007) Bénétrix et al. (2020)
Unemployment rate	Unemployment, total (% of total labor force) (modeled ILO estimate)	ILO
Top incomes	Share of the Top 1% in the pre-tax national income	WID Database

Appendix B. Results

Table B1. Estimation results

	(1)		(2)		(3)		(4)	
	Public Debt (% of GDP)		Government final consumption expenditure (% of GDP)		Taxes on income profits and capital gains (% of GDP)		Primary balance (% of GDP)	
	FE	LSDV-Kiviet	FE	LSDV-Kiviet	FE	LSDV-Kiviet	FE	LSDV-Kiviet
Lagged dependent variable (-1)	0.667***	0.720***	0.673***	0.745***	0.490***	0.550***	0.199***	0.270***
	(0.062)	(0.024)	(0.034)	(0.033)	(0.086)	(0.066)	(0.074)	(0.089)
Gini coefficient	0.264	0.296	-0.101***	-0.089*	-0.056	-0.041	0.221*	0.212***
	(0.432)	(0.470)	(0.036)	(0.052)	(0.048)	(0.045)	(0.112)	(0.046)
Share of executive term completed	-0.199*	-0.211**	-0.002	-0.002	-0.013	-0.014	0.021	0.020*
	(0.118)	(0.095)	(0.012)	(0.003)	(0.015)	(0.022)	(0.020)	(0.011)
Gini * Share of executive term completed	0.402*	0.423**	0.004	0.004	0.030	0.031	-0.055	-0.053
	(0.235)	(0.182)	(0.025)	(0.005)	(0.031)	(0.049)	(0.041)	(0.033)
Primary fiscal balance	-0.485***	-0.549						
	(0.141)	(0.394)						
GDP growth (annual %)	-0.559***	-0.622***	-0.054***	-0.054***	-0.005	-0.005	0.104**	0.106***
	(0.184)	(0.218)	(0.013)	(0.002)	(0.011)	(0.003)	(0.047)	(0.014)
GDP per capita	-0.023	0.044	0.003	0.006***	0.008	0.006***	0.019	0.015***
	(0.094)	(0.085)	(0.004)	(0.001)	(0.006)	(0.001)	(0.016)	(0.003)
Terms of trade	0.010	0.025	-0.001	-0.002***	0.002	0.001**	0.012	0.012***
	(0.031)	(0.047)	(0.003)	(0.001)	(0.004)	(0.001)	(0.007)	(0.001)
Inflation	0.345*	0.332	-0.009***	-0.008	-0.009***	-0.008	0.015	0.013
	(0.188)	(0.203)	(0.002)	(0.005)	(0.003)	(0.005)	(0.025)	(0.031)

Domestic credit to private sector (% of GDP)	-0.024	-0.036	0.008	0.003	-0.000	-0.001	-0.019	-0.017
	(0.100)	(0.068)	(0.007)	(0.003)	(0.008)	(0.000)	(0.017)	(0.028)
Expenditure rule in place (1 if yes)	0.045**	0.043***	-0.007***	-0.007***	-0.002	-0.002	0.013***	0.013***
	(0.022)	(0.012)	(0.002)	(0.001)	(0.002)	(0.002)	(0.004)	(0.001)
Revenue rule in place (1 if yes)	-0.030	-0.029***	-0.005	-0.005			-0.006	-0.007
	(0.033)	(0.011)	(0.004)	(0.004)			(0.009)	(0.006)
Budget balance rule in place (1 if yes)	0.014	0.013	-0.001	-0.001	0.001	0.002	0.004	0.004***
	(0.017)	(0.011)	(0.001)	(0.002)	(0.002)	(0.004)	(0.003)	(0.001)
Debt rule in place (1 if yes)	-0.023	-0.016	-0.003	-0.002**	-0.004	-0.004	0.006	0.006
	(0.018)	(0.016)	(0.002)	(0.001)	(0.003)	(0.003)	(0.004)	(0.004)
Constrain on the executive 2	-0.014	-0.008	0.004	0.004***	-0.001	-0.001	-0.018*	-0.017***
	(0.014)	(0.028)	(0.005)	(0.000)	(0.002)	(0.002)	(0.009)	(0.005)
Constrain on the executive 3	-0.017	-0.004	0.010*	0.010	0.004	0.004***	-0.008	-0.008***
	(0.028)	(0.033)	(0.006)	(0.007)	(0.003)	(0.000)	(0.010)	(0.002)
Constrain on the executive 4	-0.019	-0.014	0.006	0.005***	0.003	0.004	-0.023**	-0.022***
	(0.030)	(0.084)	(0.005)	(0.000)	(0.003)	(0.008)	(0.011)	(0.004)
Age dependency ratio (% of working-age population)	-0.357**	-0.404*	0.033	0.023*	0.005	0.002	0.003	0.001
	(0.172)	(0.230)	(0.026)	(0.013)	(0.014)	(0.006)	(0.044)	(0.085)
Net Foreign Assets (NFA)	-0.126**	-0.103***	-0.000	-0.000	0.000**	0.000	0.000	0.000
	(0.058)	(0.020)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
Observations	635	635	745	745	458	458	674	674
Number of countries	45	45	49	49	39	39	49	49

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Period: 1991-2015. Estimates are obtained through Fixed Effects and Least Squares Dummy Variable (LSDV)-Kiviet estimations. All models include time-fixed effects.