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Public Debt and Inequality in a Context of Financial Openness

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Abstract.

This study analyzes the influence of inequality and financial internationalization on public indebtedness, by controlling for traditional determinants of public debt and using dynamic panel data estimators. The first two factors have shown many changes in the last two decades with a marked heterogeneity between different regions and countries, while the public debt has evidenced a generalized increasing trend. We assume that, in the context of greater access to financial markets, increasing inequality induce governments to issue more debt to offset the negative impact of inequality on the economic growth, the fiscal deficit and financial stability.

Keywords: Inequality, Public Debt, Panel data, International comparison, Financial Openness.
JEL: C23, D33, D63, F41, F62, H63.

1. Introduction:

Since the consolidation of the more integrated international financial scenario in the aftermath of the Asian crisis, there has been a generalized increase in public debt-to-GDP ratios that has drawn the attention of policy-makers and economists due to the negative effects of excessive indebtedness (Omrane et al., 2015). As shown in Table 1[2], the stock of public debt in selected countries has grown from around $16.81 trillion in the early 2000s to about $51.92 trillion in 2016. Similar increases have been observed in other countries and regions.

Faced with the inability to explain this trend since the early 1980s by traditional models of tax smoothing (Barro, 1979), recent literature has sought new explanations. In this regard, the global financial crisis that began in 2007 has brought to the surface other phenomena that have been developed over the last decades. Firstly, income inequality has grown since 1990 in Europe, North America, Asia, and the Middle East, while it has decreased slightly in Latin America and Africa, but from very high levels (Figure 1). Second, there has been a deterioration in global growth that has been considered the manifestation of a long period of secular stagnation in advanced countries caused by the insufficiency of aggregate demand (Summers, 2015). Third, a generalized process of international liberalization of financial and commercial markets (see Figures 2-4) has been associated with the possibility of governments to expand debt issuance to the international markets with more sophisticated financial instruments (Azzimonti et al., 2012).

In this sense, one of the new explanations of the long-run growth of public debt is based on the possible existence of a link between income inequality and public indebtedness. Indeed, our main hypothesis is based on the increased role of income inequality and international financial integration as key determinants of the ratio of public debt over GDP. In particular, we hypothesize that in a context of deeper integration to international financial markets increasing inequality induce governments to issue more debt to compensate for the negative impact of inequality on economic growth, fiscal deficit and financial stability. This hypothesis is tested by using a dynamic panel approach with 118 countries (34 advanced and 84 developing) over 18 years from 2000 to 2017. The econometric approach starts with fixed-effects models in order to control for all time-invariant differences between countries. Furthermore, the Arellano-Bond Generalized Method of

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[2] All tables and figures are presented in the appendix.

Moments (GMM) estimator is used to deal with the issue of endogeneity. The empirical results support the hypothesis that income inequality plays a significant influence on public debt levels.

The rest of this work is organized as follows. The next section discusses the literature and previous empirical evidence. Section 3 presents the empirical model and the econometric methodology; the second part of this section provides an overview of the data and a statistical analysis of the variables. Section 4 analyses the results, and Section 5 concludes.

2. Theoretical Framework.

To finance public spending, governments must choose from different sources of funding. Higher taxes results in lower present consumption, which may slowdown the economic growth (Abbas, 2007). Issuing debt[3] could affects term, interest rates and overall costs of private and public debt financing with significant impact on economy and social welfare not only for the present, but also for future generations. Governments can also create money, thereby removing the need to pay interest, but excessive money printing could affect money demand and inflation rate (Martin, 2009). Therefore, governments have to solve the trade-off between taxes, monetary financing and debt issuance to maintain long-term economic, financial and social stability (Blanchard and Fisher, Barro, 1974).

Public debt is one of the main macroeconomic indicators, which determines countries' image in international markets (Abbas, 2007) and can have various positive and negative effects (Omrane et al., 2015). Indeed, for a debt to be sustainable, it must be used to generate economic growth and its benefits must exceed costs, otherwise serious macroeconomic problems will arise, including the possibility of debt default[4]. In this sense, understanding the factors that determine public debt dynamics is essential to make it sustainable.

Historically, the dynamics of public debt have been related to business cycle fluctuations (Barro, 1979; Lucas and Stokey, 1983; and Marcet and Scott, 2009). The concept of constant tax rates over the business cycle ("tax smoothing") is a theory of optimal budgetary policy that assumes the fulfillment of the Ricardian equivalence theorem[5]. The intuition is that the distortionary effects of taxes (deadweight losses) and the transaction costs associated with the collection of taxes and with the change of budgetary institutions should be minimized, implying that deficits occur in recessions and surpluses in economic booms.

However, the increasing trend in public debt since the early 1980s it's not consistent with the tax-smoothing model since this period was characterized by low macroeconomic volatility (Azzimonti et al., 2014).[6] In fact, most of the countries have shown an increase in debt independently of the business cycle. In this regard, Edwards and Tabellini (1991) and Roubini (1991) find that the tax-smoothing model does not always apply, particularly, in developing countries, and that inequality, political pressures and institutional quality may play a role in how governments spend and borrow debt over the business cycle. However,

[3] Government debt is created through various instruments including bonds, treasury bills and borrowing from commercial banks.

[4] According to IMF (2002) there is no definite rule to evaluate the sustainability of public debt. However, the stability of the ratio of public debt over GDP is usually used as an indicator of the sustainability of fiscal policy.

[5] The Ricardian equivalence theorem states that economic agents consider financing government expenditures by taxes or debt increases as equivalent. Therefore, expansionary fiscal policy does not have an effect on aggregate demand because rational economic subjects reduce their actual consumption when government expenditure rises, because they anticipate future tax increases assuming some intergenerational altruism (Barro, 1974).

[6] Roubini and Sachs (1989) suggest that OECD countries are only weakly countercyclical when politically fragmented, or when the political coalitions in power is too polarised to find an agreement in terms of debt creation and rescheduling. Alesina, Tabellini and Campante (2008) states that developing countries are procyclical because the electorate attempts to "starve the Leviathan", or to make sure to extract from the government all resources possible during booms, before the coalition in power wastes those resources in more frivolous activities.

studies that deal with interactions between sovereign debt and income inequality are more recent and limited in number. Additionally, since the nineties there was a gradual increase in financial globalization and deregulation that has accelerated in the new century, allowing governments to expand debt issuance to the international financial markets with more sophisticated instruments (McColliste and Karayalçin 2005; Kumhof and Ranciere, 2010; Azzimonti et al. 2014).

2.1. The channels through inequality affect public debt

Traditionally, economic literature has focused on studying income distribution as a consequence of macroeconomic performance and government policies (Kuznets, 1955). However, recent studies are concerned with the reverse causality, i.e., how income inequality can explain macroeconomic performance (Barro, 2000; Galor and Zeira, 1993; Carrera and de la Vega, 2019). This literature analyzes various effects of inequality on some key macroeconomic variables like economic growth, investment and savings, external accounts, fiscal revenues and expenditure, financial development and stability, and political economy issues. In this regard, we hypothesized that inequality affects key determinants of public debt dynamics. Based on this, we review the main channels through which there could be an effect of inequality on the ratio of Public debt-to-GDP. These channels are not independent and can interact with each other. Briefly, inequality could affect the public debt-to-GDP ratio by influencing both debt and GDP dynamics because of factors related to social and political reactions, political instability and social unrest, and financial stability.

2.2.1 Inequality, growth, and public debt.

As the first approach to the relation between the inequality and the ratio of public debt to GDP, it is important to bear in mind the interdependence between three parts of the relation. Most of the empirical and theoretical analysis only takes different pairs of this relationship. For example, the nexus between public debt and growth has been deeply studied, but even today there is no conclusion on the direction of causation. Meanwhile, the interaction between inequality and growth has also been highly studied, with a relative consensus on the effect of inequality on growth, but less clearly concerning to the transmission channels. Therefore, by analyzing the three variables together this work is an improvement with respect to the previous literature[7].

There is a rich literature that analyzes the potential effects of debt on economic growth. Traditional views point out that in the short term government borrowing can help finance economic growth-enhancing investments (including attracting foreign capital). In contrast to the views based on the Ricardian equivalence (that assume a neutral impact), Modigliani (1961) shows that sovereign debt promotes economic growth, but he also sheds light on potential negative effects off a large debt for future generations. Also Krugman (1888) shows that is possible to have a debt overhang when the assumption of perfect information is relaxed.

Since Krugman (1888), the literature tends to remark the negative impact of debt on GDP (Saint-Paul, 1992, Elmendorf and Mankiw, 1999)[8]. Briefly, the negative correlation is due to expansionary fiscal policies to push the economy in the recessions and contractionary fiscal policies in economic booms to control sovereign debt levels. Reinhart and Rogoff (2010) find that high levels of debt are negatively correlated with economic growth, but there is no link between debt and growth when public debt is below 90 percent

[7] There are some previous papers that did a similar work and that are commented below.
[8] Also Panizza and Presbitero (2012) points out that the use of the ratio of debt-to-GDP generates an automatic correlation making difficult to establish a causality.

of GDP.[9] However, because of heterogeneous conditions, it is unlikely that such thresholds could be generalized to any country and any period (Passamania et al., 2016)[10].

Aschauer (2000) shows that public debt used in infrastructure could have a positive effect on GDP but excessive debt accumulation could affect risk premium reducing private and public investment, because of higher borrowing cost. Indeed, several authors suggest that unsustainable public debt levels can weaken economic growth, increase the inflation rate and the long-term interest rate, and/or distort the distribution of the tax burden across generations (Bernheim, 1987; Padoan et al., 2012; Seater, 1993). Marchione and Parekh (2015) hypothesize a non-linear relationship between government debt and economic growth, that varies in accordance with the level of income inequality. Sanyal and Ehlen (2017) find for U.S. states over the period 1987-2011 that both public debt and income inequality has a negative effect on per-capita GDP growth.

However, Reinhart et al. (2012) suggest that the link between public debt and economic growth could be driven by the fact that it is low economic growth that leads to high levels of public debt. Here appears the attention on income inequality. In this regard, there is a wide literature that since the 1990s has emphasized the impact of inequality on growth, thus reversing the relationship hypothesized in the Kuznets curve (1955), but this literature suggests different results about this effect. Some findings suggest that inequality can harm economic growth (Alesina and Rodrik, 1994; Bertola, 1993; Bénabou, 1996; Persson and Tabellini, 1994; Perotti, 1996; Sanyal and Ehlen, 2017), while several studies analyze how different levels of inequality may lead to growth at different stages of development. Barro (2000) finds that in poor countries inequality seems to have a harmful effect on the economic growth because of credit market restrictions, whereas it appears to have a positive impact on countries with higher incomes. De Dominicis et al. (2008) perform a meta-analysis of 407 linear regressions and find that in two thirds the relationship between inequality and growth is negative, while it is positive in the rest. Other authors suggest that countries with unequal distributions of income and greater political pressures, tend to invest less because governments use foreign loans to redistribute income rather than finance public investment, lowering the future income/level of GDP (McColliste and Karayalçin, 2005). Carrera and de la Vega (2018) point out that inequality affects investment (and then growth) through a non-linear relationship.

2.2.2 Inequality, fiscal deficit, and public debt.

Because debt is one form of financing public expenditures, in the interaction between inequality and public debt there is a key role for fiscal dynamics and political economy issues[11]. Traditional literature suggests that higher income inequality is associated with a higher level of income redistribution (Romer, 1975; Roberts, 1977). Meltzer and Richard (1981) states the *median-voter* hypothesis that fiscal size depends on the difference between the median income and that of the median voter, which is a measure of income inequality. Higher inequality creates a greater political demand for redistributive policies, and politicians influenced by the median voter opt for applying redistributive expenditure, that are financed partly by distortionary taxes (Bertola, 1993; Alesina and Rodrik, 1994; Person and Tabellini, 1994). If fiscal

[9] An IMF Report (IMF, 2008) finds that the fiscal policy as a countercyclical tool is less effective in countries with high public debt (higher than 75 and 25 percent of GDP for industrial countries and emerging markets, respectively). Similarly, according to another IMF Report (IMF, 2009), the effectiveness of fiscal policy in stimulating aggregate demand during recessions is inversely related to the level of public debt.

[10] Passamania, et al. (2016) find that a long-run relationship between public debt and GDP exists for some countries but it cannot be generalized and the debt-to-GDP ratio does not always correspond to this long-run relationship. Moreover, they suggest that the short-run linkage between public debt and GDP is negative, but it is mainly determined by the events that followed the financial crisis.

[11] A political economy theory of fiscal policy can be found in Battaglini and Coate (2008).

revenues are not enough to cover the redistributive expenditure, budgetary deficits and a run-up in public debt occur. In other words, higher inequality increase pressure to shift the fiscal burden from the present generation to future generations by issuing public debt (Arawatari and Onoz, 2015). In the same vein, Davtyan (2016) points out that economic recessions accompanied by higher inequality can lead to political pressures, that induce large discretionary spending. Lower income groups demand more transfers while groups with higher incomes want lower levels of taxation. This conflict depends on the relative power of each group in the decision- making process and, in the long-run, can lead to excessive debt if the government pays for those transfers without taxing others.

Note that the above discussion implies that the Ricardian equivalence is not met, at least partially, which suggests the existence of some kind of irrationality or inconsistency of the voters. One of the possible explanations for this refers to "fiscal illusion". Voters systematically overestimate the benefits of deficit-financed government expenditures today while underestimating the future tax burden. Politicians react to such understanding opportunistically. Particularly before elections, they increase government expenditures in order to be re-elected by "fiscally deluded" voters. The theory of fiscal illusion is related to the literature on political business cycles in the sense that there is an incentive for politicians to promise or actually make an increase in transfers or a decrease in taxes before elections. A major problem with both theories is that they may explain short-term fluctuations in output and government debt, but are not able to explain different patterns between countries and the long-term growth of public debt in various European countries (Alesina and Perotti, 1995).

Several studies empirically address the relationship between inequality, fiscal deficit, and public debt. Cukierman and Meltzer (1989) suggest a positive relationship between inequality and public debt, but their analysis is restricted to closed economies and does not take into account cross-country differences in fiscal policy. Woo (2003) uses panel data and finds that inequality is related to larger public deficits via redistribution and easier access to financial markets. Larch (2012) shows that countries with higher inequality run large deficits and tend to accumulate large government debt. By using data from 50 countries in 2007, 2009 and 2011, Aizenman and Jinjarak (2012) find that higher income inequality is associated with a lower tax base, lower de-facto fiscal space, and higher sovereign spreads. Aksman (2017) investigate the hypothesis that countries with higher levels of poverty or higher income inequality are the most indebted ones because they have higher social spending to deal with these problems. He finds that neither poverty nor income inequality are statistically significant predictors of the public debt-to-GDP ratio and suggests that this is because countries that report higher absolute poverty or higher income inequality de facto spend less on social benefits, while countries with higher relative poverty do not have higher social spending than the rest of the sample[12]. Jabłoński (2013) finds that a rise in income inequality led to an increase in public debt in OECD countries in the period 1995–2010. Arawatari and Onoz (2015) show that when the elasticity of intertemporal substitution is less than one, a low inequality country performs a tight fiscal policy with a small increase of public debt, but a country with high inequality experiences a loose fiscal policy with large public debt. The opposite happens when the elasticity of intertemporal substitution is greater than one.

2.2.3 Inequality, financial markets and public debt.

Because of the large relative importance of public debt in total assets and liabilities, its dynamics and the probability of events of rescheduling or default are key determinants of the evolution of domestic financial markets and of the access to external markets. In this regard, it is important to have in mind that,

[12] Aksman (2017) defines absolute poverty in terms of the deficiency of material resources to guarantee a minimal standard of living, while relative poverty refers to a state of lacking means as compared to other members of a distinct population (country). Hence, countries with the same relative poverty rates may differ with respect to the absolute income of the poor.

unlike atomized private agents, governments internalize the effect of their actions on the equilibrium interest rate and therefore can act strategically (Azzimonti, 2014). Indeed, from this non-atomistic nature of governments (Chang, 1990) derives the channel through which capital mobility affects public borrowing in open economies[13].

In this sense, another important link between inequality and public debt is the potential effects of the former on financial stability and integration to external financial markets. For example, Bohoslavsky (2016) suggests that inequality can contribute to the growth and crises of sovereign debt for at least two reasons: (a) higher inequality induce the generation and increase of private debt, with strong interrelationships between excessive private debt, public debt, and financial crises (Duesenberry, 2014); and (b) inequality harms social and political stability, thereby hampering growth and both government revenue and spending. Kumhof and Ranciere (2010) show that, in a context of sophisticated instruments that ease the access to financial markets to more strata of the population, greater inequality induces a greater debt of households and, consequently, increases the financial fragility of the economy when individual difficulties to repay the debt appear.

Therefore, among the various purposes for which a government can issue debt, one is to protect financial stability and improve the functioning of financial markets. The reason is that due to uninsurable idiosyncratic risk, private saving is inefficiently high so the government uses public debt to crowd-out private capital. This government intervention to avoid a financial crisis and stabilize markets is a superior result because it reduces the potential output losses, while the higher output allows to absorb the higher public debt (Bazillier and Hericourt, 2016).

Therefore, the combination of a) deregulation of financial markets, b) financial innovation and sophistication, and c) international financial integration have boosted the public debt issuance in international markets first, from advanced countries and then from the emerging ones. The important fact is that this factor interacts with inequality. In this regard, based on a multi-country model with incomplete markets and endogenous government borrowing, Azzimonti et al. (2012, 2014) show that governments choose higher levels of public debt if financial markets become internationally integrated and income inequality rises. Income inequality is associated with greater uninsurable idiosyncratic risks that result in higher demand for safe assets and a lower interest rate, and consequently, higher government borrowing. An increase in the levels of public debt in one country decreases international interest rates, thus stimulating demand for public debt in other countries, and this effect increases with the size of the economy that issue debt. The intuition behind that is that in a globalized world, the demand and supply of a specific government debt come from both domestic and foreign agents. Therefore, each country faces a lower elasticity of the interest rate to the supply of their public debt and then governments have more incentives to increase borrowing. This context of free capital mobility and endogenous international interest rate, allows the authors to point out that higher inequalities in one country lead to increasing public debt in other countries, where income inequalities do not necessarily grow.[14]

The previous theoretical strong results are valid even if countries are homogeneous. A complementary literature is the one referred to global imbalances that assume asymmetric countries. In fact, in the context of international financial integration several author remarked the importance of the so-called “saving glut” in Asian countries (Bernanke, 2005, Caballero and Krishnamurthy, 2009). These countries, due to the small

[13] According to the model of Azzimonti (2014), with only atomistic private agents the autarky equilibrium is the same that the one with capital mobility, but the existence of a public sector produces different equilibriums with and without capital mobility even in the case of homogeneous countries.

[14] If debt crises are more likely to arise when the stock of public debt is higher, then the growth in government borrowing induced by capital market liberalization and increased income inequality may contribute to triggering a sovereign debt crisis.

dimension of their local markets, have generated a huge international demand of safe assets like the sovereign bonds of advanced economies[15], which implied a lower cost for the public debt instruments of high-income economies, but also -because of risk appetite and portfolio diversification- more available financing for public and private debt of emerging markets (Gourinchas and Rey, 2007; Lane and Milesi-Ferretti, 2007; Caballero and Krishnamurthy, 2009).

A related branch in the literature connects inequality with sovereign debt defaults. McColliste and Karayalçin (2005) show that, in unequal societies, redistributive policies are partially financed by external loans as the government responds to social demands. In turn, this can lead to increased risk of default, as international lenders limit the extension of credit to these countries, which then invest less and grow at a slower pace.

Indeed, the impact of income inequality on the creditors' perception of the probability of repaying is crystallized in the credit ratings. For example, in a recent report, Moody's[16] says: "*Rising inequality is a key social consideration that will impact the U.S.' credit profile through multiple rating factors, including economic, institutional and fiscal strength"...."It would also likely boost government spending to support lower-income households, which is unlikely to be offset by revenue raising measures following recent tax cuts."..."Overall, rising inequality will make it more politically difficult to mitigate the US' adverse fiscal dynamics over the medium term".* This suggests that the benchmark of rating agencies assumes that inequality generates political and social reactions that compromise fiscal dynamics.

In this regard, Kim (2017) suggests that sovereign default implies an intertemporal trade-off between a current consumption shock and a future tax increase and the poorer the median voter is the higher the majority demand for default and the riskier the country is. Kim (2017) also shows that countries with intermediate levels of inequality have a higher probability of default. The intuition is that sovereign default occurs when risky sovereigns successfully induce creditors to provide a loan, but the riskiest ones are among those least able to do so. Also, Ferriere (2015) show that more unequal economies present higher probabilities of default.

3. Empirical strategy.

In sum, we do not claim that the increasing income inequality in a context of financial and commercial openness is the only factor explaining the rising public debt in various countries, but it is a key determinant that has gotten much attention in the last years. This is why we use a multidimensional approach to evaluate possible causes of the growth of public debt-to-GDP ratios.

The variable of interest is the **Gini Coefficient of Disposable Income** (Solt, 2016). Between the scarce literature that includes inequality as a public debt determinant, we find Bittencour (2015) who investigates what are the main determinants of government and external debt in South America over the period 1970-2007. He is not able to report conclusive evidence that inequality has played any role in increasing debt. Meanwhile, Azzimonti et al. (2012) find that in 16 OECD countries, national debt growth was associated with an increased income inequality from 1973 to 2005, as measured by the share of total income earned by the top 1% of the population. Additionally, Santos (2014) finds for a panel of 26 European countries over

[15] For example, The U.S. debt to China is $1.11 trillion as of May 2019. That's 27% of the $4.1 trillion in Treasury bills, notes, and bonds held by foreign countries.

[16] Reuters (2018) Rising inequality will likely weigh on U.S. credit rating: Moody's. BUSINESS NEWS OCTOBER 8, 2. Available at: https://www.reuters.com/article/us-usa-ratings-moodys/rising-inequality-will-likely-weigh-on-us-credit-rating-moodys-idUSKCN1MI1O5

the years 2005 to 2010 that income inequality is positively associated with the probability of a sovereign incur in default.

Although empirical studies on the determinants of public debt remain scarce and limited (Drazen, 2000; Imbeau and Pétry, 2004; Swaray, 2005; Pirtea et al., 2013; Bittencour, 2015), we are able to identify some determinants that are usually considered and they are presented below with a brief intuition of the expected sign and the findings of previous studies. We also report the source between parentheses. At the end of each bullet we quote bibliography with the expected sign in parentheses (+ = positive; - = negative; . = no significant; ? = depends on certain conditions)

- We include the **Lagged Central Government Debt** (IMF), that it's expected to be positive indicating that the debt-to-GDP ratio is a persistent variable (Bittencourt, 2015).
- **Fiscal Balance in terms of GDP.** (IMF's WEO database (General Government net lending/borrowing), supplemented with data from the OECD and the European Commission's "Annual Macro-Economic Database" (AMECO) (General Government net lending/net borrowing)). Governments borrow to bridge the gap between public expenditures and revenues[17]: (+) Dornbusch and Fisher (1990); Colander and Gamber (2002); Süssmuth and Weizsäcker (2006); Pirtea et al. (2013); Globan and Matosec (2016); Arawatari and Ono (2015)[18].
- **Economic growth (WDI).** On the one hand, the tax-smoothing model by Barro (1974) implies that deficits are registered in recessions and surpluses in economic booms. Therefore, the public debt follows a countercyclical path. On the other, economies which grow consistently faster tend to present lower debt. Higher economic growth should certainly diminish the pressure on internal and external borrowing. Intuitively, higher economic growth increase public revenues and lowers social demands and it implies a higher denominator in the ratio of public debt-to-GDP. (-): Eichengreen and Portes (1986); Hall and Sargent (2011); Sinha et al. (2011); Pirtea et al. (2013); Bittencourt (2015); Swamy (2015); Gargouri and Ksantini (2016); Globan and Matosec (2016).
- **GDP per capita (log).** A higher level of development measured by the GDP per capita is usually associated with deeper local financial market, better access to international financial markets and lower risk, which implies a higher level of debt.
- **Inflation rate** its usual log transformation [log (1 + inflation=100)] (WDI). Aizenman and Marion (2009) also found that inflation reduces the value of debt. The connection stems from the fact that unanticipated high inflation can reduce the real cost of servicing the debt. This is largely because the efficacy of the inflation channel is quite sensitive to the maturity structure of the debt. Long-term nominal government debt is extremely vulnerable to inflation; short-term debt is far less so. Any government that attempts to inflate away the real value of short term debt will soon find itself paying much higher interest rates when it comes time to refinance. (-): Aizenman and Marion (2009); Hall and Sargent (2010); Bittencourt (2015); Swamy (2015).
- **Old Dependency rate** (WDI). The ratio of dependents older than 64 years of age to the working-age population aged from 15 to 64 years. It is expected to be positive as the aging population puts strong upward pressure on public expenditure and public debt through age-related health care and public pension expenditure (Creel et al., 2012). (+) Arawatary and Ono (2015).
- **Trade openness (Exports plus Imports over GDP)** (WDI). Trade openness is the most traditional way of examining international integration and usually precedes the financial channel. Kourtellos et al (2015) suggest that the relationship between economic growth and sovereign debt may also be influenced by a third variable such as trade openness. The more open economies tend to show lower debt through a higher collection of export taxes and import duties). (+): Swamy (2015).

[17] However, governments also issue public debt for various macroeconomic purposes like controlling the amount of money in circulation or maintain financial stability. Also governments may accumulate public debt to support public and profitable investment, for example in physical infrastructure and human resources, by public spending in education and healthcare.

[18] Arawatari and Ono (2015) use government expenditure instead of fiscal deficit and also find a positive sign.+

- **Net Foreign Assets Position ("NFA") (% GDP)** (Lane and Milesi-Ferretti (2006, 2017). This variable reflects the history of the current account as a series of surpluses (deficits) that correlates with an accumulation (de-accumulation) of foreign assets. By decomposing the current account between saving and investment, a positive NFA implies that domestic savings exceed domestic investments.
- **Gross Foreign Assets and Liabilities (IFI) (% GDP) (Lane and Milesi-Ferretti, 2006).** The IFI/GDP ratio provides a volume-based *de facto* measure of international financial integration. It is defined as: $IFI_{it} = \frac{FA_{it}+FL_{it}}{GDP_{it}}$, where FA (FL) denotes the stock of external assets (liabilities).
- **Capital Account Openness (Chin-Ito Index).** This is a way of analyzing the *de jure* international financialization of a country. According to Azzimonti, et al. (2012, 2014) the access to a wider market at a global scale, ceteris paribus, increases the ratio debt/GDP that is optimal for governments. (+) Azzimonti, et al. (2012).
- **Constraints on the executive (XCONST) (Polity IV dataset).** It is expected that more constrained executives (or better checks and balances) tend to be more restrained in how they generate public debt. (.) Bittencourt (2015)

3.1 Granger causality.

The theoretical analysis suggests the possible existence of endogeneity between several variables in our analysis. Therefore, in the first place, we evaluate the direction of the causality between public debt and inequality and other factors by using Granger causality test for panel data[19] (Dumitrescu and Hurlin, 2012). The results shown in Table 2 suggest that inequality granger-cause public debt. In particular, we reject the null hypothesis that inequality does not granger-cause public debt, and do not reject the null hypothesis that public debt does not cause inequality. These results are robust to different criteria of lags selection. Therefore, the rest of the empirical strategy will focus on the effect of income inequality on public debt.

3.2 Econometric analysis. Methodological strategy.

We want to explain the behavior of the ratio of Central Government Debt over GDP (public debt) as a function of usual determinants but with emphasis on an inequality indicator, the Gini coefficient. Our empirical model will try to control by a wide set of variables contrasting different theoretical approaches and we will use a broad sample of countries that includes advanced and developing countries. Hence, by using a panel of 118 countries (34 advanced and 84 developing) over 18 years from 2000 to 2017, the baseline specification is (subscripts *i* and *t* refer to the country and time period, respectively):

$$public\_debt_{i,t} = \alpha\, public\ debt_{i,t-1} + \beta_1 gini_{i,t} + x'_{i,t}\gamma + \mu_i + \delta_t + \varepsilon_{it}$$

where public debt is the Central Government Debt (% GDP), Gini is the Gini coefficient of disposable income**,** $x_{i,t}$ is a vector of control variables, μ_i is a fixed effect per country δ_t is a time fixed effect; and ε_{it} the unobservable error term. Including the lagged dependent variable as a right-hand-side variable allows for a partial adjustment mechanism in the underlying process and helps ensure consistent estimates of the coefficients of other regressors.

Initially, since most variables are either ratios (e.g., public debt, trade and financial openness), or bounded within closed intervals (e.g., inequality), and consequently stationary by default, we do not pursue

[19] As we need balanced panels without gaps to run Granger tests and that it is very difficult to have a database like that, we keep only countries with less than four missing values of each variable and interpolate those data.

the issue of cointegration in panels here. In addition, Bohn (1998) suggests that debt-to-GDP ratios tend to be mean-reverting because of the positive relationship between primary surpluses and debt which tends to satisfy the government intertemporal budget constraint.

The econometric analysis of equation (2) faces several sources of potential biases that can result in biased and inconsistent estimates. In particular, simultaneous solutions are required for the problems imposed by the following: the strong inertia that characterizes the public debt; the moderate variation over time of both the dependent variable and of the key explanatory variable (*Gini*); and the potentially endogenous regressors. In this regard, a variety of estimation methodologies are considered to deal with such problems and ensure robust results. Each of these estimators implies a trade-off between different types of biases.

In short, it is difficult to know *a priori* which estimator results in a lower total bias in the presence of several sources of potential biases. However, based on Roodman (2009), we consider the D-LSDVC and SGMM estimators to be the most appropriate tools to deal with these problems. While both provide consistent and unbiased estimates, the first is relatively more efficient but it does not address the potential endogeneity problems.

4. Results.

By using three econometric methodologies, we analyze two empirical models: one where we only add inequality to traditional determinants of public debt and another where we also add commercial and financial openness. Table 3 shows the results of three alternative econometric methodologies, which are discussed sequentially to illustrate the benefits of the proposed empirical strategy.

The first relevant result is that ignoring the inertia in the public debt would lead to biased and inconsistent estimates, especially in cases like this, where the autoregressive parameter shows a high persistence. As explained above, a consistent estimate of this coefficient should be around the dynamic fixed-effect (D-LSDVC) and the SGMM[20] [21] estimates. The Hansen and second-order autocorrelation tests do not reject the validity of the set of instruments in the SGMM estimates.[22]

We find that a higher inequality is, ceteris paribus, positively associated with public debt. The coefficients of the three econometric methodologies that are considered more relevant in literature lie between 0.43 and 0.74. This implies that an increase in 1% in the Gini coefficient increase the debt by approximately 0.8%. This result contradicts Aksman (2017) who finds that income inequality is not a statistically significant predictor of the public debt-to-GDP ratio, and also Bittencourt (2015) who is not able to report conclusive evidence that inequality has played any role in increasing debt in South America.

The control variables mostly exhibit the expected signs.

- The coefficient of fiscal balance is negative and very significant across the different models, ranging between -0.6 and 0.8. This is consistent with the previous theoretical and empirical literature.

[20] The two-step variant was made incorporating the correction by finite sample of Windmeijer (2005), and the transformation of orthogonal deviations that, instead of subtracting the previous observation of the contemporary one, subtracts the average of all the available future observations of the variable, so that it minimizes the loss of data, and since lagged observations do not enter into the formula, they are valid as instruments (Roodman, 2009).

[21] In GMM models the number of instruments grows exponentially when T increases. This implies that in a typical macro panel (larger T and smaller N than in a micro panel) it is common for the second step variance-covariance matrix to become singular if instruments are not restricted and it weakens the power of the Hansen's test. For this reason, a collapsed instrument matrix is used and the instruments are restricted.

[22] In the GMM system estimates, all the variables are considered as endogenous, so they are instrumented with the second lag of the instrument in levels for the transformed equation, and from lag 1 to x=(2,3,4) for the differences in the equation in levels.

- The GDP growth is associated negatively and highly significant in all models. This is consistent with the findings in previous studies. The reason is twofold. On the one hand, this result is consistent with the tax-smoothing model (Barro, 1974). On the other, higher economic growth increases public revenues and lowers social demands and it implies a higher denominator in the ratio of debt over GDP.
- For the log of GDP per capita we find the expected sign, that is positive in all the models except FE. The results are statistically significant only in the SGMM estimates. This means that the richest countries (mostly advanced) have more capacity to issue debt in terms of GDP.
- Inflation is negative for public debt being a representation of the effect of the nominal volatility on the economy. This is consistent with the idea that inflation reduces the real value of debt. Most of this reasoning is valid mainly for advanced economies that have relatively low levels of inflation. Given the dimensions and heterogeneity of our sample is possible to have complementary explanations for developing countries where high inflation reduces the attractiveness of public debt bonds issued in domestic currency. Hence, countries with middle or high inflation should issue public debt indexed by their own inflation or in foreign currency. Therefore, the negative sign could have different interpretations according to the long-run inflation rates of each country.
- In respect to the old-age dependency rate, we find positive coefficients being statistically significant only in FE and Kiviet estimates.
- One of the key objectives of the empirical strategy is to analyze if the different channels of international economic integration could influence the public indebtedness. We find a positive sign for the trade openness, being consistent with the previous literature, but not statistically significant.
- For financial integration, we use one of the most common measures that is the Net Foreign Assets of the country. The results are negative and significant, with the coefficients ranging between 0.022 and 0.047. This means that countries with a total large positive net claims in term of GDP regarding the rest of the world, have also a lower level of public debt-to-GDP. It is worth to remember that NFA is the total net financial position, hence one possible interpretation comes from decomposing the current account between saving and investment. A positive NFA implies that the country had higher levels of domestic saving vis-a-vis domestic investments. Possibly, one of the reason for this past behavior was to have lower fiscal deficits, that allowed -ceteris paribus- higher current account results.

4.1 Robustness tests[23].

In sum, our results show a strong causal relationship between inequality and public indebtedness even after controlling for traditional public debt determinants and the variables that represents the international integration of the economies. However, as we have seen in the literature review, the political economy issues of the processes of indebtedness have gained attention in recent years. In that regard, several databases have emerged characterizing the institutional mechanisms for decision making in each country. Following Bittencourt (2015), we consider that the Polity IV is one of the best projects in this matter.

In particular, we use the variable XCONST that refers to the extent of 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.

[23] Some robustness exercises only report FE and Kiviet estimates due to the limited availability of information for certain variables or subsamples

We incorporate these categories in our empirical model and repeat the baseline regression. It is expected that more constrained executives (or better checks and balances) tend to be more restrained in how they generate public debt (Bittencourt, 2015). The results (Table 4) show that inequality -and also the rest of the traditional determinants- is still statistically significant. With respect to the institutional variables, we find out that the most authoritarian governments present, ceteris paribus, a higher level of debt with GDP. Possibly, this result is due to government has the opportunity of approving higher debt levels without a strong opposition or any at all. Simultaneously, seem implicit that domestic and international market do not take the extreme authoritarian position of the government as an impediment/obstacle/restriction to demand the public debt issue by these governments. In other words, seem from this evidence that markets privilege political control over legal institutionalization.

4.1.1 Subsamples of Advanced and Developing countries

Table 5 presents the regressions corresponding to the expanded model for subsamples by the level of development based on the IMF classification. Notice that we are keeping the control of GDP per capita that is usually considered a proxy for the level of development. As a test of robustness, the sub-samples behave steadily despite having a remarkably lower number of observations. Therefore, they confirm the assessments made for the complete model. The signs are similar to the ones in the general regression.

4.2. Unemployment and Debt

Despite its methodological advantages, the Gini coefficient is often criticized because it is too abstract, which makes its interpretation difficult for a large part of society. Moreover, it is possible that the decisions of governments aimed at addressing social problems are guided by a more direct variable in the perception of voters. In fact, in several models of political economy it is common to use unemployment as an objective variable. The unemployment rate sometimes is a more direct indicator of social unrest and political instability. Moreover, in advanced countries, the existence of developed social safety nets partially financed by public deficits that respond, for example, to the increase of the unemployment rate have a vital role as economic automatic stabilizers (Neck and Getzner, 2001; Veiga and Veiga, 2014). However, these automatic stabilizers are not so common in developing countries.

In that regard, as a robustness test, we perform our baseline regression substituting the Gini coefficient by the unemployment rate. The results presented in Table 6 show that there is a similar relationship. Higher unemployment implies more debt-to-GDP, with coefficients that range between 0.318 and 0.456 and are statistically significant in almost all the models and across the different methodologies. The rest of the controls variables performs in the same way that in the original model based on the Gini coefficient.

4.3. Alternative measures of income inequality

In addition to the Gini coefficient as the main indicator of inequality, there has been in recent years a generalized use of the upper percentiles of income distribution as an alternative measure of income inequality. Different works and a large group of economists (Piketty and Saez, 2006, Piketty, 2014) have remarked that the high concentration of national income in the upper extreme of the distribution defines a new phase of modern capitalism (Alvaredo et al. 2013). In addition, a traditional way of analyzing income inequality has been linked to the functional distribution measured with the share of labor income in GDP. Therefore, as another robustness check, we present our regression for FE and Kiviet using both the Top 1% and the wage share instead of the Gini coefficient. It is worth highlighting that the number of available countries in the top incomes database is much lower than in the case of the Gini. The results in Table 7 shows a positive sign for the Top1 in both models, which is also highly stable around 0.44. Hence, an

increase in the participation of Top 1 in national income of 1% implies and increase public debt-to-GDP by 0.45%. On the other hand, an increase in the labor income share in GDP is associated with a decrease in public debt (Table 8). Hence, these results are consistent with the baseline regression with the Gini coefficient. The rest of the variables preserve the same sign as in the baseline regressions but with a lower level of statistical significance.

4.4. Does redistribution imply more public debt?

After finding a positive relationship between inequality and public debt, we want to analyze if the intensity of redistribution, measured by the percentual difference between the Gini coefficient before and after the government intervention (taxes and subsidies), affects public debt. As we can see in the Figure 5, the region below the 45-degree line shows that fiscal interventions tend to reduce the inequality that results from market conditions. This redistributive impact seems to be more intense in Europe than in other regions. The Table 9 show the different empirical model with the redistributive impact instead of the Gini coefficient.

4.5. Alternative measures of international financial integration

Our main hypothesis is based on the increased role of income inequality and international financial integration as key determinants of the ratio of public debt over GDP in the new Century. Therefore, complementing the previous robustness tests, now we control for different measures of financial international integration. In particular, here we substitute the NFA with the Chinn and Ito Index (Chinn and Ito, 2006) and with the gross stocks of foreign assets and liabilities (IFI).

Regarding the Chinn and Ito index, according with Table 10 the signs are negative across all models. This suggests that more *de jure* integration to the international financial markets put more limits to the debt/GDP ratio, ceteris paribus. This could suggest that in closed economies governments could issue more debt on a "captive" market, than in one economy where domestic investors can diversify portfolios internationally. This result differs from previous works which suggest that financial openness allows countries to issue more debt (Azzimonti et al. 2012). In this regard, it is worth mentioning that this particular result of Azzimonti et al. (2012) is controversial because it uses a dummy variable to control for financial openness and a measure of inequality that only takes into account the upper tail of the income distribution. One additional reason for discrepancy could be that previous papers were mostly concentrated in advanced economies, where the considerations referred to portfolio diversification are plausible. By having a broad and diversified database that includes emerging and less developed countries with a lower level of financial development -even if they are open financially according to a *de jure* assessment-, we are allowed to have a more precise effect of this type of opening.

However, our results are in line with McColliste and Karayalçin (2005). Indeed, our results are also consistent with the implicit benchmark of credit analysis of rating agencies (Reuters, 2019), that suggest the idea that financial openness implies more demanding scrutiny and externa control. Incluso esto puede implicar un mayor autocontrol por parte de los gobiernos en el momento de emitir la deuda.

The use of IFI is not as popular in empirical literature as the NFA. However, it is useful to have another complementary point of view. In particular, using IFI is a way of analyzing the *de facto* international financialization of a country. Notice that two countries could have a similar level of net foreign exposition (NFA) but very different level of total gross assets and liabilities (IFI). It is clear that if you have large amounts of external assets and liabilities the country should have deep (and relatively sophisticated)

financial sector. All the models in Table 11 shows a positive sign, but the coefficients are not statistically significant.

4.6 Interactions between Inequality and Financial integration.

Finally, we analyze whether inequality interacts with financial openness (Table 12a and 12b). In particular, if greater deregulation of the capital account allows higher levels of public debt when accessing a broader market or involves more scrutiny and control over the ratio of public debt-to-GDP that a government could have. Due to the negative estimated coefficient of the interaction term, we could say that the marginal effect of income inequality (financial integration) is decreasing, in absolute value, on the level of financial integration (income inequality). Intuitively, this could be an indication that risk assessments of public debt give a negative weight to increasing inequality. This result contradicts recent empirical and theoretical results such as Azzimonti et al. (2012, 2014).

5. Conclusion

After the nineties, the world economy has shown three concurrent trends of great importance. First, despite certain heterogeneity, most countries have lived in a period characterized by an increasing financial internationalization and financialization. Second, there has been an increase in income inequality in a large number of countries that gained centrality in the economic policy agenda. Simultaneously, the public debt has gained importance, both as a way of financing public expenditure demands that cannot be covered with taxes, and because of its key role in the development and stability of domestic and international financial markets.

By using a broad sample of 114 countries, we find that greater inequality and financial internationalization are important determinants of public debt dynamics. In particular, we find that income inequality and NFA cause the public debt in Granger's sense. Then, we use three dynamic panel estimators for two empirical models: one where we only add inequality to traditional determinants of public debt and another where we also add financial and commercial openness. The main result is that, even controlling for those traditional determinants, we find that inequality, measured by the Gini coefficient, is a highly significant determinant of public debt. In particular, an increase in inequality is associated with a rise in the public debt-to-GDP ratio. The same results appear when we separate the complete sample between advanced and developing countries. Regarding to the traditional debt determinants, they have the expected signs. In particular, we find that GDP growth, the level of income per capita, the fiscal balance and the rate of inflation negatively affects public debt, while a greater participation of the adult population implies more public debt. The coefficient associated with the trade openness presents a positive sign. In other words, a greater integration to the goods and services markets is associated with greater public indebtedness.

On the other hand, we find that financial integration, measured by the total net creditor position / NFA / of the economy, is associated with lower public debt. We also find that the greater the total sum of assets and liabilities of a country (a measure of *de-facto* financial openness) the larger its public debt-to-GDP ratio. However, being open in *de-jure* terms to capital flows (legal regulations) is associated with lower levels of public debt compared to countries that are more closed. These results suggest that being more open in respect to the legal norms does not imply having more total public debt, but having (effectively) a deeper and internationalized financial system (many assets and/or plus liabilities /regarding/over/ its product) is associated with a higher level of public debt-to-GDP. However, if the country as a whole is a net creditor, a lower government debt is observed in comparison to net debtor economies. In fact, there are few countries like Japan or Argentina that are simultaneously large net creditors and the government has a large amount of public debt. Additionally, we find that certain institutions like those that imply checks and balances on the decision-making process affect the dynamics of the public debt. In particular, countries with authoritarian

regimes tend to issue more public debt than the countries with greater institutional controls in the decision process, ceteris paribus.

When we separate the complete sample between advanced and developing countries, inequality continues to be a highly significant determinant of public debt, with only small changes in coefficients. We perform robustness tests by using alternative measures of income inequality and social disruptions such as the national income share of top percentiles (top 1%) and the unemployment rate, and we find complementary results. Moreover, we run regressions replacing the Gini Coefficient by the distributive impact measured by the percentage difference between the Gini that results from market conditions and the Gini post fiscal intervention. We find that this variable is positively associated with public debt, which means that an increasing redistributive correction induces a rise in public debt.

We also perform regressions of the baseline model but including an interaction term between inequality and financial openness (this variable in its three variants), which shows a negative estimated coefficient. Therefore, this suggests that the marginal effect of income inequality (financial integration) is decreasing, in absolute value, on the level of financial integration (income inequality). Intuitively, this could be an indication that risk assessments of public debt give a negative weight to increasing inequality. This result contradicts recent empirical and theoretical results such as Azzimonti et al. (2012, 2014).

In sum, we find that governments issue more debt in the face of higher income inequality, because of reasons that can range from the political economy that explain why governments shift the fiscal burden from the present generation to future generations, up to the link between inequality and financial system that demands public debt issuing as a stabilizer.

Future research could measure this phenomenon/ with more disaggregated data, for example, differentiating between the type of debt issued by the government, residence of creditors and the role of private domestic and external indebtedness divided by strata of income. Moreover, an extension that explicitly studies the possibility of default on sovereign debt is left for future research. It will be also important to analyze if for the high percentiles the greater mobility of capital and access to other markets that allow to diversify risk and increase returns do not explain neither the greater inequality due to more financial income nor the greater public indebtedness due to the impossibility of taxing additionally those internationalized percentiles of the population. In other words, greater access to international markets could increase the income of high percentiles more than proportionately and, given the regulatory and tax arbitrage with the rest of the world, prevent domestic tax increases that compensate for the growing inequality. Therefore, in this context governments are driven to issue more public debt.

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Appendix

Table 1. Public Debt. Selected Countries and Income Groups (2000-2016),
(Trillons in US dollar)

Country	2000	2004	2008	2012	2016
Brazil	0.41	0.45	1.03	1.48	1.32
China	0.28	0.51	1.24	2.93	4.94
France	0.66	1.14	1.61	1.93	1.91
Germany	0.74	1.11	1.49	1.78	1.51
India	0.26	0.39	0.57	0.86	1.05
Indonesia	0.14	0.13	0.15	0.21	0.26
Italy	1.16	1.72	2.31	2.42	2.38
Japan	4.80	6.27	7.32	11.60	9.74
Mexico	0.13	0.16	0.27	0.34	0.40
Russia	0.15	0.13	0.10	0.21	0.18
United Kingdom	0.60	0.91	1.41	2.22	2.31
United States	4.26	5.58	7.89	13.45	16.71
Advanced	14.32	19.65	26.13	39.19	40.09
Emerging	2.49	3.50	5.59	9.15	11.83
World	**16.81**	**23.15**	**31.72**	**48.34**	**51.92**

Figure 1. Gini Coefficient of disposable income. Simple Averages.

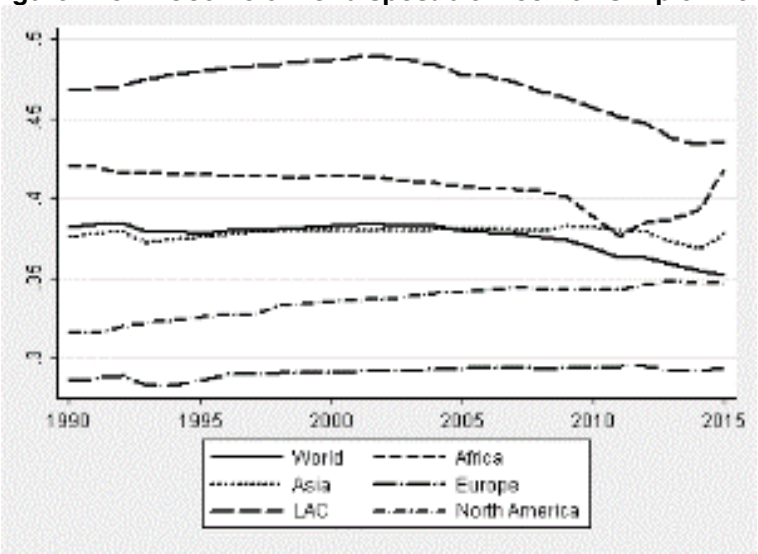

Figure 2. Trade Openness (Exports plus Imports over GDP). Simple Averages.

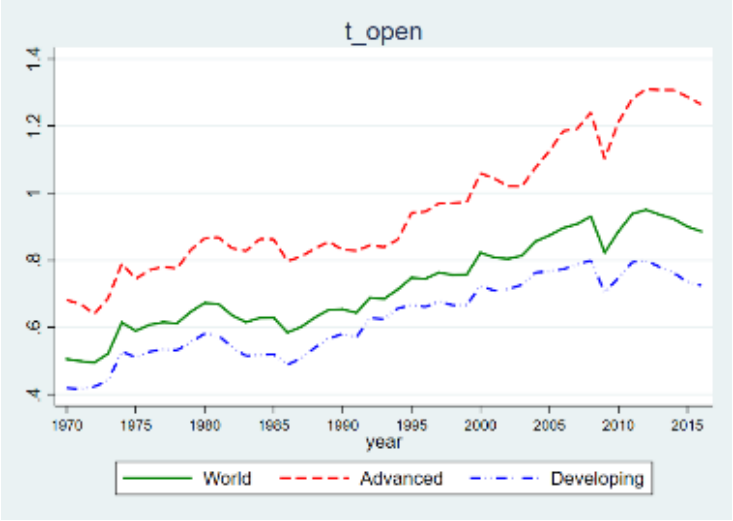

Figure 3. Chin-Ito Index. Simple Averages.

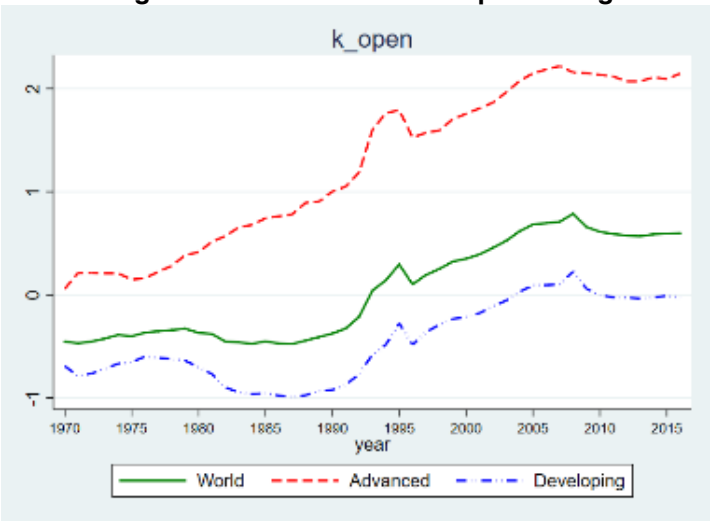

Figure 4. Financial Assets plus Liabilities over GDP. Simple Averages.

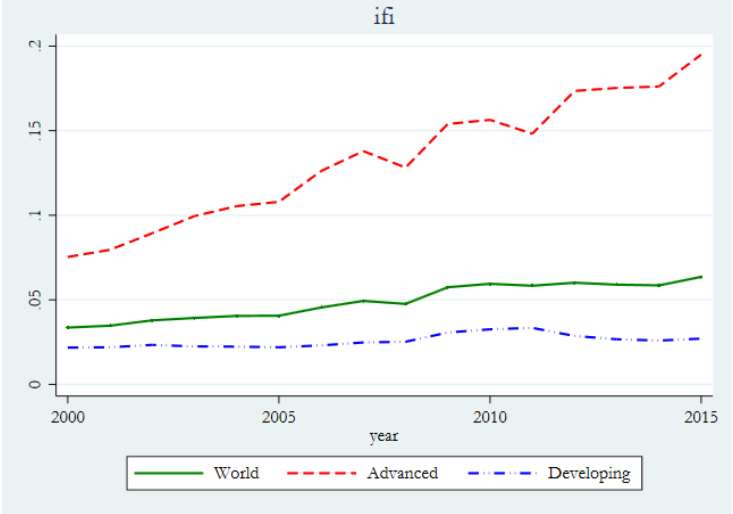

Table 2. Granger Causality Tests.

H0 = indep-var does not Granger-cause var-dep
H1 = indep-var does Granger-cause var-dep for at least one panelvar (id)

Dep. Variable	**indep. Variable**	**Criterio para los lags**	**Nro óptimo de lags**	**W-bar**	**Z-bar**		**Z-bar tilde**	
					estadístico	p-value (95% critical value)	estadístico	p-value (95% critical value)
Public Debt	Gini	AIC	4 (lags tested: 1 to 4)	12.5529	29.6281	**0.0840** (32-5387)	4.6241	**0.0840** (5.2842)
Public Debt	Gini	BIC	4 (lags tested: 1 to 4)	12.5529	29.6281	**0.0780** (31.7294)	4.6241	**0.0780** (5.1007)
Public Debt	Gini	HQIC	4 (lags tested: 1 to 4)	12.5529	29.6281	**0.0940** (32.8876)	4.6241	**0.0940** (5.3633)
Gini	Public Debt	AIC	4 (lags tested: 1 to 4)	8.9034	16.9858	**0.4960** (33.3878)	1.7571	**0.4940** (5.4768)
Gini	Public Debt	BIC	1 (lags tested: 1 to 4)	3.9232	20.2525	**0.0600** (21.2156)	14.3570	**0.0600** (15.0811)
Gini	Public Debt	HQIC	4 (lags tested: 1 to 4)	8.9034	16.9858	**0.5140** (31.4998)	1.7571	**0.5140** (5.0486)

Figure 5. Gini coefficient before (x-axis) and after (y-axis) taxes and subsidies

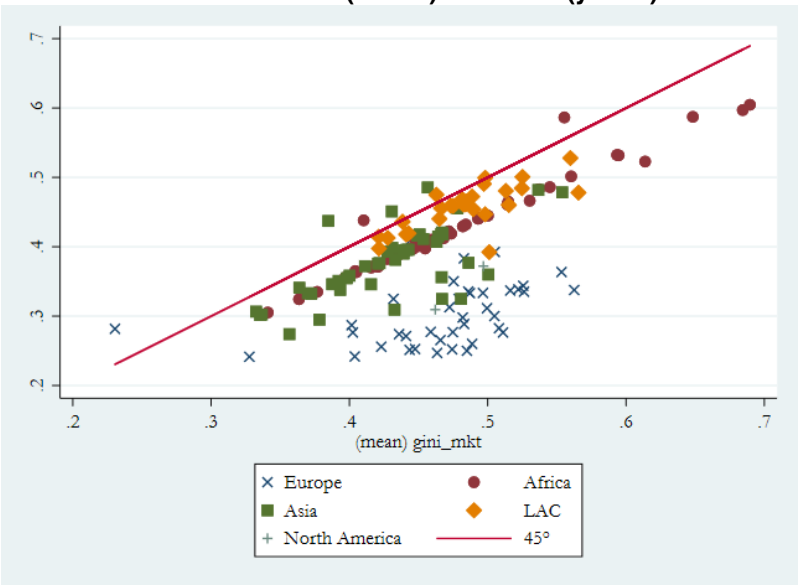

Table 3. Regression. Full model.

	(1) FE2 cggd	(2) FE1 cggd	(3) KIV2 cggd	(4) KIV1 cggd	(5) GMM 2 cggd	(6) GMM 2 cggd	(7) GMM 3 cggd	(8) GMM 3 cggd
Gini	0.688***	0.761***	0.684***	0.741***	0.672*	0.653**	0.436	0.547*
	(0.234)	(0.213)	(0.192)	(0.199)	(0.340)	(0.327)	(0.272)	(0.309)
Public Debt (-1)	0.767***	0.809***	0.819***	0.861***	0.802***	0.815***	0.792***	0.838***
	(0.0249)	(0.0215)	(0.00829)	(0.00615)	(0.0396)	(0.0330)	(0.0331)	(0.0368)
GDP Growth	-0.584***	-0.614***	-0.601***	-0.620***	-0.615**	-0.766***	-0.680***	-0.669***
	(0.115)	(0.113)	(0.0210)	(0.0363)	(0.279)	(0.212)	(0.188)	(0.169)
PBI (log)	-0.0271	-0.0138	-0.00251	0.00954	0.0248	0.0139	0.0224	0.0194
	(0.0292)	(0.0268)	(0.00620)	(0.0106)	(0.0161)	(0.0243)	(0.0140)	(0.0200)
Old Dependency Rate	0.546*	0.297	0.357**	0.126***	0.331	0.381	0.165	0.247
	(0.306)	(0.257)	(0.145)	(0.00159)	(0.295)	(0.256)	(0.290)	(0.234)
Fiscal Balance	-0.688***	-0.703***	-0.706***	-0.706***	-0.854***	-0.599**	-0.757***	-0.672**
	(0.0737)	(0.0739)	(0.00906)	(0.0505)	(0.280)	(0.293)	(0.247)	(0.282)
Inflation Rate	-0.128	-0.142**	-0.144***	-0.163***	-0.246**	-0.255**	-0.200**	-0.237***
	(0.0793)	(0.0697)	(0.00900)	(0.00578)	(0.108)	(0.0993)	(0.0861)	(0.0786)
Trade Openness	0.00264		0.00174		0.0152		0.0234	
	(0.0143)		(0.00495)		(0.0306)		(0.0262)	
Net Foreign Assets Position	-0.0365***		-0.0277***		-0.0228*		-0.0303**	
	(0.00893)		(0.00446)		(0.0119)		(0.0144)	
Constant	0.488	0.147			-0.882*	0	-0.705*	0
	(0.785)	(0.717)			(0.498)	(0)	(0.368)	(0)
Observations	1,561	1,634	1,561	1,634	1,561	1,634	1,561	1,634
Number of id	118	118	118	118	118	118	118	118
R-squared	0.882	0.881						
Hansen p-value	.	.	.	.	0.265	0.177	0.410	0.159
AR 2 p-value	.	.	.	.	0.759	0.699	0.761	0.630
Number of instruments	.	.	.	.	42	38	60	52

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Time period: 2000-2017. All models includes time effects.

Table 4. Full model with institutions.

	(1) FE2 cggd	(2) FE1 cggd	(3) KIV2 cggd	(4) KIV1 cggd	(5) gmm_l_2 cggd	(6) gmm_s_2 cggd	(7) gmm_l_3 cggd	(8) gmm_s_3 cggd
Gini	0.663***	0.744***	0.693	0.753***	0.572	0.579*	0.430	0.443**
	(0.223)	(0.227)	(0.524)	(0.00864)	(0.382)	(0.311)	(0.269)	(0.205)
Public Debt (-1)	0.767***	0.813***	0.833***	0.877***	0.818***	0.837***	0.816***	0.836***
	(0.0262)	(0.0195)	(0.0101)	(0.00990)	(0.0491)	(0.0381)	(0.0324)	(0.0271)
GDP Growth	-0.602***	-0.626***	-0.624***	-0.633***	-0.649**	-0.720**	-0.800***	-0.768***
	(0.118)	(0.112)	(0.0209)	(0.00362)	(0.313)	(0.325)	(0.243)	(0.238)
PBI (log)	-0.0319	-0.0118	0.00192	0.0173	0.0251*	0.0155	0.0201*	0.0143
	(0.0220)	(0.0184)	(0.00626)	(0.0164)	(0.0137)	(0.0159)	(0.0102)	(0.0119)
Old Dependency Rate	0.493**	0.282	0.254***	0.0422	-0.133	0.0113	0.0648	0.125
	(0.218)	(0.174)	(0.0303)	(0.174)	(0.318)	(0.276)	(0.235)	(0.216)
Fiscal Balance	-0.668***	-0.657***	-0.695***	-0.669***	-0.809***	-0.623**	-0.805***	-0.751***
	(0.0605)	(0.0588)	(0.0228)	(0.0465)	(0.292)	(0.308)	(0.217)	(0.257)
Inflation Rate	-0.114*	-0.126**	-0.128***	-0.146***	-0.196**	-0.262***	-0.139	-0.204***
	(0.0626)	(0.0590)	(0.00981)	(0.0530)	(0.0865)	(0.0951)	(0.0879)	(0.0678)
Trade Openness	-0.00199		-0.00114		0.0447		0.0358	
	(0.0144)		(0.0311)		(0.0372)		(0.0314)	
Net Foreign Assets Position	-0.0475***		-0.0307***		-0.00993		-0.0161	
	(0.0125)		(0.00981)		(0.0203)		(0.0162)	
Institutions Cat 2	-0.0397**	-0.0370*	-0.0353**	-0.0324***	-0.00721	-0.0364	-0.00769	-0.0623
	(0.0202)	(0.0201)	(0.0154)	(0.0104)	(0.0434)	(0.0808)	(0.0550)	(0.0705)
Institutions Cat 3	-0.0259	-0.0259	-0.0253*	-0.0247	-0.00825	-0.0538	-0.0419	-0.0918
	(0.0158)	(0.0160)	(0.0136)	(0.0162)	(0.0421)	(0.0717)	(0.0592)	(0.0712)
Institutions Cat 4	-0.0392*	-0.0290	-0.0396***	-0.0313	0.0546	0.0150	-0.00710	-0.0559
	(0.0200)	(0.0193)	(0.00646)	(0.0196)	(0.0634)	(0.0681)	(0.0703)	(0.0606)
Constant	0.666	0.129			-0.837*	-0.529	0	0
	(0.592)	(0.503)			(0.458)	(0.484)	(0)	(0)
Observations	1,486	1,557	1,486	1,557	1,486	1,557	1,486	1,557
Number of id			114	114	114	114	114	114
R-squared	0.965	0.965						
Hansen p-value	.	.	.	.	0.250	0.0518	0.345	0.0614
AR 2 p-value	.	.	.	.	0.936	0.968	0.879	0.977
Number of instruments	.	.	.	.	51	47	75	67

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Time period: 2000-2017. All models includes time effects.

Table 5. Subsamples for Advanced and Developing countries.

	Advanced				Emerging			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	FE2	FE1	KIV2	KIV1	FE2	FE1	KIV2	KIV1
	cggd	cggd	cggd	cggd	cggd	cggd	cggd	cggd
Gini	0.629	0.611	0.708***	0.464***	0.573**	0.712***	0.572***	0.696
	(0.467)	(0.464)	(0.190)	(0.0714)	(0.285)	(0.252)	(0.138)	(0.559)
Public Debt (-1)	0.901***	0.933***	0.951***	0.941***	0.719***	0.765***	0.771***	0.820***
	(0.0226)	(0.0165)	(0.00142)	(0.00666)	(0.0274)	(0.0223)	(0.0148)	(0.00818)
GDP Growth	-0.563***	-0.611***	-0.575***	-0.638***	-0.558***	-0.587***	-0.573***	-0.598***
	(0.172)	(0.164)	(0.126)	(0.0174)	(0.126)	(0.129)	(0.0380)	(0.0131)
PBI (log)	-0.113***	-0.0801**	-0.0926***	-0.0253	0.000846	0.0168	0.0194	0.0349***
	(0.0294)	(0.0314)	(0.0225)	(0.0181)	(0.0402)	(0.0338)	(0.0187)	(0.0125)
Old Dependency Rate	0.0467	-0.0923	-0.0710**	-0.119	0.533	0.537	0.315	0.291
	(0.200)	(0.171)	(0.0352)	(0.0965)	(0.488)	(0.410)	(0.506)	(0.232)
Fiscal Balance	-0.722***	-0.715***	-0.714***	-0.726***	-0.616***	-0.628***	-0.641***	-0.642***
	(0.120)	(0.124)	(0.0275)	(0.0222)	(0.0775)	(0.0773)	(0.0442)	(0.00522)
Inflation Rate	0.198	0.166	0.258***	0.0310	-0.108	-0.120*	-0.123**	-0.145***
	(0.161)	(0.204)	(0.0808)	(0.130)	(0.0786)	(0.0654)	(0.0563)	(0.0401)
Trade Openness	0.00264		-0.000453		-0.0104		-0.00829*	
	(0.0109)		(0.00354)		(0.0260)		(0.00464)	
Net Foreign Assets Position	-0.0134***		-0.0100**		-0.0554***		-0.0378***	
	(0.00431)		(0.00395)		(0.0168)		(0.00465)	
Constant	2.860***	2.049**			-0.169	-0.669		
	(0.788)	(0.859)			(1.031)	(0.869)		
Observations	501	526	501	526	1,060	1,108	1,060	1,108
Number of id	34	34	34	34	84	84	84	84
R-squared	0.951	0.953			0.865	0.863		
Hansen p-value	.	.	.	.	.	.	.	.
AR 2 p-value	.	.	.	.	.	.	.	.

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Time period: 2000-2017. All models include time effects.

Table 6. Unemployment

	(1) FE2 cggd	(2) FE1 cggd	(3) KIV2 cggd	(4) KIV1 cggd	(5) GMM 2 cggd	(6) GMM 2 cggd
Unemployment	0.474***	0.511***	0.420**	0.439***	0.648**	0.112
	(0.178)	(0.173)	(0.192)	(0.157)	(0.282)	(0.211)
Public Debt (-1)	0.701***	0.756***	0.751***	0.808***	0.768***	0.803***
	(0.0396)	(0.0362)	(0.00498)	(0.00404)	(0.0657)	(0.0402)
GDP Growth	-0.496***	-0.503***	-0.511***	-0.509***	-0.519*	-0.652**
	(0.113)	(0.103)	(0.0744)	(0.0602)	(0.311)	(0.324)
PBI (log)	-0.0276	-0.0175	-0.00666	0.00205	0.0331	-0.0182
	(0.0442)	(0.0353)	(0.0178)	(0.0155)	(0.0203)	(0.0205)
Old Dependency Rate	0.944**	0.501*	0.762***	0.312	-0.154	0.111
	(0.364)	(0.282)	(0.190)	(0.309)	(0.258)	(0.161)
Fiscal Balance	-0.691***	-0.736***	-0.726***	-0.757***	-0.792***	-0.773***
	(0.0840)	(0.0833)	(0.0210)	(0.00504)	(0.225)	(0.231)
Inflation Rate	-0.107	-0.116	-0.123***	-0.142**	-0.366***	-0.308***
	(0.0855)	(0.0704)	(0.0333)	(0.0563)	(0.0851)	(0.0676)
Trade Openness	-0.0178		-0.0204		0.0145	
	(0.0231)		(0.0269)		(0.0358)	
Net Foreign Assets Position	-0.0502***		-0.0410***		-0.0536	
	(0.0153)		(0.000775)		(0.0450)	
Constant	0.710	0.471			-0.817	0
	(1.176)	(0.942)			(0.524)	(0)
Observations	1,696	1,935	1,696	1,935	1,696	1,935
Number of id	0.932	0.937	0.857	0.857		
R-squared	.	.	.	.	.	.
Hansen p-value	.	.	.	.	0.265	0.177
AR 2 p-value	.	.	.	.	0.759	0.699
Number of instruments	.	.	.	.	42	38

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Time period: 2000-2017. All models include time effects.

Table 7. Top 1% income

	(1) FE2 cggd	(2) FE1 cggd	(3) KIV2 cggd	(4) KIV1 cggd
Unemployment	0.448	0.456	0.448***	0.445***
	(0.284)	(0.295)	(0.0969)	(0.0362)
Public Debt (-1)	0.657***	0.679***	0.692***	0.711***
	(0.0637)	(0.0605)	(0.0166)	(0.0408)
GDP Growth	-0.754***	-0.675***	-0.765***	-0.689***
	(0.233)	(0.225)	(0.0767)	(0.0580)
PBI (log)	-0.0912	-0.0554	-0.0631	-0.0343**
	(0.0658)	(0.0441)	(0.0684)	(0.0158)
Old Dependency Rate	1.064*	1.037*	1.004***	0.939
	(0.585)	(0.523)	(0.238)	(0.778)
Fiscal Balance	-0.776***	-0.829***	-0.806***	-0.850***
	(0.196)	(0.207)	(0.0404)	(0.0428)
Inflation Rate	0.0296	0.0366	-0.0243	-0.0222
	(0.321)	(0.333)	(0.0369)	(0.177)
Trade Openness	0.0138		0.00626	
	(0.0410)		(0.0459)	
Net Foreign Assets Position	-0.0372**		-0.0312***	
	(0.0159)		(0.0111)	
Constant	2.420	1.469		
	(1.846)	(1.253)		
Observations	484	484	484	484
Number of id	484	484	484	484
R-squared	.	.	.	.

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Time period: 2000-2017. All models includes time effects.

Table 8. Wage Share

	(1) FE2 cggd	(2) FE1 cggd	(3) KIV2 cggd	(4) KIV1 cggd	(5) gmm_l_2 cggd	(6) gmm_s_2 cggd	(7) gmm_l_3 cggd	(8) gmm_s_3 cggd
Wage Share	-0.145	-0.127	-0.146	-0.131**	-0.386*	-0.360	-0.415*	-0.470*
	(0.135)	(0.124)	(0.111)	(0.0597)	(0.217)	(0.288)	(0.220)	(0.263)
Public Debt (-1)	0.711***	0.740***	0.757***	0.781***	0.808***	0.793***	0.784***	0.782***
	(0.0391)	(0.0370)	(0.00671)	(0.0135)	(0.0607)	(0.0590)	(0.0486)	(0.0537)
GDP Growth	-0.629***	-0.590***	-0.639***	-0.596***	-0.632*	-0.817*	-0.905***	-1.126***
	(0.127)	(0.112)	(0.0873)	(0.0612)	(0.365)	(0.450)	(0.305)	(0.319)
PBI (log)	-0.0645**	-0.0474	-0.0428***	-0.0312***	0.000169	-0.00603	0.0103	0.00594
	(0.0317)	(0.0297)	(0.0153)	(0.000627)	(0.0166)	(0.0200)	(0.0120)	(0.0140)
Old Dependency Rate	0.876**	0.699**	0.693***	0.541***	0.186	0.144	0.202	0.182
	(0.343)	(0.348)	(0.0325)	(0.0673)	(0.325)	(0.338)	(0.267)	(0.304)
Fiscal Balance	-0.788***	-0.775***	-0.796***	-0.771***	-0.847***	-0.679***	-0.975***	-0.658***
	(0.0939)	(0.0949)	(0.0141)	(0.0127)	(0.180)	(0.168)	(0.203)	(0.171)
Inflation Rate	-0.154*	-0.168**	-0.188***	-0.199***	-0.425***	-0.383***	-0.311*	-0.314**
	(0.0825)	(0.0791)	(0.0614)	(0.00558)	(0.137)	(0.124)	(0.184)	(0.153)
Trade Openness	-0.0248		0.0596		-1.820		-1.226	
	(1.933)		(0.632)		(3.860)		(3.122)	
Net Foreign Assets Position	-0.0152		-0.0131***		-0.00602		-0.00421	
	(0.0115)		(0.00108)		(0.0125)		(0.0100)	
Constant	1.785**	1.337			0.319	0.419	0.0413	0
	(0.860)	(0.816)			(0.451)	(0.499)	(0.300)	(0)
Observations	1,806	2,100	1,806	2,100	1,806	2,100	1,806	2,100
Number of id	0.827	0.833						
R-squared	.	.	.	.	0.0670	0.0368	0.0536	0.0226
Hansen p-value	.	.	.	.	0.856	0.739	0.938	0.822
AR 2 p-value	.	.	.	.	42	38	60	52
Number of instruments	129	131	129	131	129	131	129	131

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Time period: 2000-2017. All models includes time effects.

Table 9. Redistributive intensity

	(1) FE2 cggd	(2) FE1 cggd	(3) KIV2 cggd	(4) KIV1 cggd
Redistributive Intensity	-0.918**	-1.102***	-0.883***	-0.981***
	(0.409)	(0.387)	(0.0545)	(0.292)
Public Debt (-1)	0.766***	0.809***	0.819***	0.861***
	(0.0237)	(0.0203)	(0.00874)	(0.00522)
GDP Growth	-0.581***	-0.608***	-0.599***	-0.615***
	(0.118)	(0.116)	(0.0192)	(0.0392)
PBI (log)	-0.0273	-0.0135	-0.00232	0.0101
	(0.0285)	(0.0273)	(0.00822)	(0.00767)
Old Dependency Rate	0.605*	0.385	0.422***	0.227***
	(0.311)	(0.260)	(0.105)	(0.0675)
Fiscal Balance	-0.692***	-0.704***	-0.709***	-0.705***
	(0.0709)	(0.0714)	(0.00655)	(0.0551)
Inflation Rate	-0.130*	-0.142**	-0.147***	-0.165***
	(0.0781)	(0.0680)	(0.0117)	(0.00151)
Trade Openness	0.00571		0.00491	
	(0.0157)		(0.00400)	
Net Foreign Assets Position	-0.0372***		-0.0284***	
	(0.00952)		(0.00515)	
Constant	0.650	0.302		
	(0.762)	(0.732)		
Observations	1,561	1,634	1,561	1,634
Number of id	0.881	0.880		
R-squared	.	.	.	.

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Time period: 2000-2017. All models includes time effects.

Alternative measures of international financial integration

Table 10 Chinn-Ito Index

	(1) FE2 cggd	(2) FE1 cggd	(3) KIV2 cggd	(4) KIV1 cggd	(5) gmm_l_2 cggd	(6) gmm_s_2 cggd	(7) gmm_l_3 cggd	(8) gmm_s_3 cggd
Gini	0.764***	0.761***	0.764***	0.741***	0.773**	0.653**	0.952***	0.547*
	(0.225)	(0.213)	(0.0246)	(0.199)	(0.362)	(0.327)	(0.333)	(0.309)
Public Debt (-1)	0.820***	0.809***	0.891***	0.861***	0.826***	0.815***	0.831***	0.838***
	(0.0216)	(0.0215)	(0.0417)	(0.00615)	(0.0399)	(0.0330)	(0.0438)	(0.0368)
GDP Growth	-0.626***	-0.614***	-0.632***	-0.620***	-0.913***	-0.766***	-0.937***	-0.669***
	(0.125)	(0.113)	(0.0748)	(0.0363)	(0.292)	(0.212)	(0.255)	(0.169)
PBI (log)	-0.00642	-0.0138	0.0265	0.00954	0.0339*	0.0139	0.0262*	0.0194
	(0.0272)	(0.0268)	(0.0316)	(0.0106)	(0.0180)	(0.0243)	(0.0155)	(0.0200)
Old Dependency Rate	0.255	0.297	-0.0391	0.126***	0.334	0.381	0.525*	0.247
	(0.268)	(0.257)	(0.288)	(0.00159)	(0.264)	(0.256)	(0.270)	(0.234)
Fiscal Balance	-0.697***	-0.703***	-0.720***	-0.706***	-0.786***	-0.599**	-0.872***	-0.672**
	(0.0742)	(0.0739)	(0.0573)	(0.0505)	(0.250)	(0.293)	(0.276)	(0.282)
Inflation Rate	-0.113	-0.142**	-0.136***	-0.163***	-0.353***	-0.255**	-0.317***	-0.237***
	(0.0795)	(0.0697)	(0.0297)	(0.00578)	(0.0806)	(0.0993)	(0.0827)	(0.0786)
Trade Openness	0.00840		0.0128		0.0468		0.0518	
	(0.0131)		(0.0307)		(0.0489)		(0.0391)	
Chinn-Ito Index	-0.00406		-0.00415		-0.0234		-0.0226*	
	(0.00353)		(0.00436)		(0.0148)		(0.0116)	
Constant	-0.0557	0.147			0	0	0	0
	(0.734)	(0.717)			(0)	(0)	(0)	(0)
Observations	1,571	1,634	1,571	1,634	1,571	1,634	1,571	1,634
Number of id	0.881	0.881						
R-squared	.	.	.	.	0.529	0.177	0.349	0.159
Hansen p-value	.	.	.	.	0.609	0.699	0.606	0.630
AR 2 p-value	.	.	.	.	43	38	61	52
Number of instruments	114	118	114	118	114	118	114	118

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Time period: 2000-2017. All models includes time effects.

Table 11. IFI / International Financial Integration

	(1) FE2 cggd	(2) FE1 cggd	(3) KIV2 cggd	(4) KIV1 cggd	(5) gmm_l_2 cggd	(6) gmm_s_2 cggd	(7) gmm_l_3 cggd	(8) gmm_s_3 cggd
Gini	0.764***	0.761***	0.753***	0.741***	0.693*	0.653**	0.603*	0.547*
	(0.226)	(0.213)	(0.200)	(0.199)	(0.376)	(0.327)	(0.358)	(0.309)
Public Debt (-1)	0.804***	0.809***	0.859***	0.861***	0.804***	0.815***	0.817***	0.838***
	(0.0217)	(0.0215)	(0.00639)	(0.00615)	(0.0322)	(0.0330)	(0.0384)	(0.0368)
GDP Growth	-0.625***	-0.614***	-0.635***	-0.620***	-0.767***	-0.766***	-0.701***	-0.669***
	(0.120)	(0.113)	(0.0147)	(0.0363)	(0.226)	(0.212)	(0.224)	(0.169)
PBI (log)	-0.00480	-0.0138	0.0191***	0.00954	0.0290	0.0139	0.0280	0.0194
	(0.0279)	(0.0268)	(0.00428)	(0.0106)	(0.0208)	(0.0243)	(0.0178)	(0.0200)
Old Dependency Rate	0.403	0.297	0.179	0.126***	0.230	0.381	0.158	0.247
	(0.286)	(0.257)	(0.135)	(0.00159)	(0.255)	(0.256)	(0.276)	(0.234)
Fiscal Balance	-0.737***	-0.703***	-0.743***	-0.706***	-0.718***	-0.599**	-0.774***	-0.672**
	(0.0745)	(0.0739)	(0.00487)	(0.0505)	(0.266)	(0.293)	(0.253)	(0.282)
Inflation Rate	-0.125*	-0.142**	-0.150***	-0.163***	-0.214**	-0.255**	-0.193**	-0.237***
	(0.0730)	(0.0697)	(0.00693)	(0.00578)	(0.0975)	(0.0993)	(0.0757)	(0.0786)
Trade Openness	0.00448		0.00678		0.0442		0.0378	
	(0.0143)		(0.00756)		(0.0539)		(0.0387)	
IFI	0.0253		0.0110		0.00981		0.0130	
	(0.0302)		(0.0167)		(0.0595)		(0.0489)	
Constant	-0.111	0.147			0	0	-0.926*	0
	(0.748)	(0.717)			(0)	(0)	(0.528)	(0)
Observations	1,561	1,634	1,561	1,634	1,561	1,634	1,561	1,634
Number of id	0.877	0.881						
R-squared	.	.	.	.	0.385	0.177	0.293	0.159
Hansen p-value	.	.	.	.	0.818	0.699	0.763	0.630
AR 2 p-value	.	.	.	.	42	38	60	52
Number of instruments	118	118	118	118	118	118	118	118

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Time period: 2000-2017. All models includes time effects.

Table 12a Regression. Interaction Gini and NFA

	(1) FE2 cggd	(2) FE1 cggd	(3) KIV2 cggd	(4) KIV1 cggd	(5) gmm_l_2 cggd	(6) gmm_s_2 cggd	(7) gmm_l_3 cggd	(8) gmm_s_3 cggd
Gini	0.635**	0.630**	0.669***	0.644***	0.418	0.520	0.162	0.181
	(0.246)	(0.245)	(0.187)	(0.104)	(0.291)	(0.325)	(0.294)	(0.232)
Gini*NFA	-0.0848	-0.114***	0.00822	-0.0804***	-0.0555	-0.0831*	-0.0943	-0.0864**
	(0.0985)	(0.0273)	(0.0266)	(0.0100)	(0.124)	(0.0430)	(0.149)	(0.0414)
Public Debt (-1)	0.761***	0.759***	0.814***	0.812***	0.827***	0.796***	0.813***	0.801***
	(0.0282)	(0.0270)	(0.0102)	(0.0157)	(0.0430)	(0.0423)	(0.0426)	(0.0392)
GDP Growth	-0.584***	-0.586***	-0.600***	-0.602***	-0.466	-0.623**	-0.535**	-0.615***
	(0.114)	(0.108)	(0.0222)	(0.0300)	(0.284)	(0.264)	(0.227)	(0.210)
PBI (log)	-0.0317	-0.0337	-0.00415	-0.00696	0.0253*	0.0138	0.0257*	0.0200
	(0.0318)	(0.0296)	(0.00776)	(0.0294)	(0.0152)	(0.0204)	(0.0150)	(0.0168)
Old Dependency Rate	0.529*	0.527*	0.371**	0.354	0.218	0.385	-0.0691	0.0690
	(0.310)	(0.313)	(0.156)	(0.284)	(0.279)	(0.245)	(0.266)	(0.252)
Fiscal Balance	-0.684***	-0.675***	-0.709***	-0.698***	-0.759***	-0.727**	-0.829***	-0.752***
	(0.0759)	(0.0760)	(0.0108)	(0.0207)	(0.265)	(0.292)	(0.197)	(0.224)
Inflation Rate	-0.135*	-0.148*	-0.142***	-0.159***	-0.248**	-0.274**	-0.242***	-0.216**
	(0.0805)	(0.0779)	(0.0114)	(0.0606)	(0.0956)	(0.116)	(0.0825)	(0.0895)
Trade Openness	0.00589		0.00321		0.0121		0.0317	
	(0.0144)		(0.00471)		(0.0227)		(0.0208)	
Net Foreign Assets Position	-0.00950		-0.0300***		0.00314		0.00576	
	(0.0286)		(0.00392)		(0.0369)		(0.0496)	
Constant	0.630	0.691			-0.797*	-0.532	0	0
	(0.862)	(0.790)			(0.424)	(0.599)	(0)	(0)
Observations	1,561	1,576	1,561	1,576	1,561	1,576	1,561	1,576
Number of id	0.882	0.883						
R-squared	.	.	.	.	0.0901	0.117	0.201	0.158
Hansen p-value	.	.	.	.	0.680	0.604	0.675	0.560
AR 2 p-value	.	.	.	.	45	39	65	55
Number of instruments	118	118	118	118	118	118	118	118

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Time period: 2000-2017. All models includes time effects.

Table 12b Interaction Gini and K Openness

	(1) FE2 cggd	(2) FE1 cggd	(3) KIV2 cggd	(4) KIV1 cggd	(5) gmm_l_2 cggd	(6) gmm_s_2 cggd	(7) gmm_l_3 cggd	(8) gmm_s_3 cggd
Gini	0.764***	0.781***	0.773***	0.780***	0.953***	0.926***	0.938***	0.983***
	(0.245)	(0.226)	(0.0454)	(0.104)	(0.334)	(0.327)	(0.332)	(0.350)
Gini*Chinn-Ito Index	0.000273	-0.00901	-0.00975	-0.00949	-0.219*	-0.0508	-0.0762	-0.0654*
	(0.0428)	(0.00933)	(0.0673)	(0.00663)	(0.121)	(0.0413)	(0.0994)	(0.0385)
Public Debt (-1)	0.820***	0.820***	0.892***	0.896***	0.823***	0.822***	0.835***	0.844***
	(0.0214)	(0.0213)	(0.0402)	(0.00766)	(0.0363)	(0.0403)	(0.0391)	(0.0447)
GDP Growth	-0.626***	-0.624***	-0.631***	-0.624***	-0.931***	-0.923***	-0.952***	-0.876***
	(0.124)	(0.118)	(0.0778)	(0.0419)	(0.310)	(0.290)	(0.251)	(0.276)
PBI (log)	-0.00641	-0.00768	0.0260	0.0277***	0.0297	0.0310	0.0233	0.0262
	(0.0274)	(0.0259)	(0.0345)	(0.0104)	(0.0203)	(0.0219)	(0.0163)	(0.0217)
Old Dependency Rate	0.256	0.259	-0.0472	-0.0274	0.211	0.454*	0.509*	0.558*
	(0.268)	(0.265)	(0.239)	(0.0859)	(0.257)	(0.242)	(0.269)	(0.283)
Fiscal Balance	-0.697***	-0.690***	-0.721***	-0.715***	-0.872***	-0.739**	-0.886***	-0.855**
	(0.0744)	(0.0739)	(0.0633)	(0.0255)	(0.248)	(0.308)	(0.252)	(0.348)
Inflation Rate	-0.113	-0.123	-0.136***	-0.143***	-0.336***	-0.332***	-0.296***	-0.319***
	(0.0795)	(0.0749)	(0.0285)	(0.0114)	(0.0539)	(0.0958)	(0.0803)	(0.0786)
Trade Openness	0.00841		0.0127		0.0428		0.0504	
	(0.0130)		(0.0315)		(0.0492)		(0.0433)	
Net Foreign Assets Position	-0.00416		-0.000426		0.0675		0.00395	
	(0.0157)		(0.0214)		(0.0496)		(0.0410)	
Constant	-0.0559	-0.0229			-1.088*	-1.093*	0	0
	(0.734)	(0.692)			(0.599)	(0.635)	(0)	(0)
Observations	1,571	1,586	1,571	1,586	1,571	1,586	1,571	1,586
Number of id	0.881	0.882						
R-squared	.	.	.	.	0.822	0.445	0.499	0.150
Hansen p-value	.	.	.	.	0.572	0.836	0.574	0.836
AR 2 p-value	.	.	.	.	46	40	66	56
Number of instruments	114	114	114	114	114	114	114	114

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Time period: 2000-2017. All models includes time effects.