Income Inequality and External Wealth of Nations[1]

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Abstract

We study the relationship between income inequality and external wealth using dynamic panel data models with annual observations of 88 emerging and developing economies for the period 1970-2020. We find evidence in favor of a significant and positive association between inequality indicators and net external wealth. This relationship is statistically significant for all income inequality measures and net external wealth variables. If the Top 1 of the richest individuals in a given country increments their share by 1 percentage point this will produce an average same-year increment in net foreign assets of 0.45% in terms of the country's GDP. The long-run effect is more than double in magnitude (1.05% of GDP). For the Top 10, the long-run effect increases tenfold (11.6% of GDP). When disaggregated into foreign assets and liabilities, we find a heterogeneous behavior of the financial elites. These findings reveal that financialized elites have a greater propensity to accumulate external wealth than the rest of the population.

Keywords: Income Inequality, Net External Wealth, Panel Data Models.

JEL Codes: O15, F21, C23.

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1. Introduction

Emerging markets and developing economies (EMDEs) are characterized by two stylized facts over the last twenty years. On the one hand, income inequality has become a topic of increasing interest in the public and academic agenda in this period and augmented its relevance after a series of cumulative shocks such as the Global Financial Crisis of 2008-2009, the COVID-19 pandemic, the Ukraine War, and a new cycle of global inflation and restrictive monetary policy (Rodrik, 2022). On the other hand, there has been an increasing interest in the net external wealth of nations (Lane and Milesi-Ferretti, 2001). Combining these two empirical regularities, the lifting tendencies in financialization studies have increased the interest in inequality and its related effects (Khatatbeh and Moosa, 2021).

Financial integration in EMDEs is rather segmented: not all social strata benefit equally. The financial elite has obtained the most out of it because of its access to international markets and the possibility to diversify its global portfolio. The presence of international capital mobility would allow for risk diversification if countries with different patterns of production and trade specializations are hit by idiosyncratic shocks (Gourinchas and Rey, 2014). The effect of inequality on net external wealth in different economies is, as far as we know, a topic that has not been studied yet. Hence, this paper is concerned with this missing link.

The main contribution of the present paper is to empirically test if there is a link between different forms of income inequality and the composition of national wealth in terms of foreign vs. domestic assets and liabilities. Specifically, this work aims to answer the question about the relationship between income inequality and the net external wealth of nations. To do that, we provide estimations of dynamic panel data models with annual data for which we use five-year periodicity for the 1970-2020 period covering 61, 64, 86, or 88 countries—depending on the empirical specification and data availability— and find a positive relationship between income inequality measures[7] (as measured by either Top 1, Top 10, and Gini of disposable income), and net external wealth indicators. We also study the dynamics of foreign assets and liabilities separately.

In a seminal contribution, Lane and Milesi-Ferretti (2001) analyze the determinants of the External Wealth of Nations (NFA/GDP, where NFA is the Net Foreign Assets to GDP ratio) through capital movements trends for industrialized and developing countries. The findings of that paper show the main factors explaining heterogeneity across countries in terms of their net external positions.

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[7] See Alvaredo (2011) and Alvaredo et al. (2013) for a discussion on these variables to measure inequality.

After this publication, several scholars have examined the relationship between NFA/GDP and different related issues. For instance, the association between inequality and the structure of countries' external liabilities (Harms et al., 2022), what drives the decline of the US NFA position and the reversal in returns earned on the US NFA using a portfolio-based framework (Jiang et al., 2022); NFA/GDP and currency composition (Hale and Juvenal, 2021; Bénétrix et al., 2019); disaggregated NFA/GDP by financial instruments (Lane and Milesi-Ferretti, 2017); risky vs. safe net external assets and liabilities (Scott Davis and van Wincoop, 2021); the influence of Net International Investment Position (IIP) on the external vulnerability of economies (Cubeddu et al., 2021); how the NFA imbalances affect the accumulation of foreign wealth (Alberola et al., 2018); the evolution of the International Financial Integration to GDP index (IFI/GDP) since the Global Financial Crisis (Lane and Milesi-Ferretti, 2017); the co-movements of NFA/GDP accumulation, consumption, real exchange rate, and real interest rate in a cross-section of advanced and developing countries (Chia et al., 2014); the effect of the terms of trade on NFA/GDP (Arezki and Brückner, 2012); the association between NFA/GDP and the real exchange rates (Lane and Milesi-Ferretti, 2004); and the reaction of economies to shocks that influence the initial position of NFA/GDP (Bussiere et al., 2003).

Although these varieties of contributions, the empirical relationship between income inequality and external wealth has not been explicitly asserted. The difficulty lies in simultaneously modeling income or wealth inequality together with portfolio decisions on foreign vs. domestic assets and liabilities. This is a topic of special interest for EMDEs where financial wealth faces higher exposure to local exchange rate shocks than in developed countries, thus having important consequences for countries' external balances and fiscal performance. Moreover, EMDEs are exposed to international capital flows that may trigger sudden stops and balance of payment crises, and the composition of national wealth has a significant effect on that issue.

Kumhof et al. (2012) is one related contribution to explain the positive relationship between income inequality and NFA/GDP. These authors built up a DSGE model with heterogeneous agents in an open economy setting, where the richest individuals receive dividends from firms and the poorest ones only earn wages. The former group has a higher propensity to save and accumulate net external assets, while the latter is mostly paid in local currency. Thus, inequality affects the aggregate net external wealth position of a country. Regarding this economic intuition, financialized elites show a greater propensity to accumulate net external wealth and demand larger amounts of NFA/GDP when income inequality goes up. When bottom earners' income share declines at the expense of top earners, who have a much higher marginal propensity to save, top earners respond by increasing not only their consumption but also their desired wealth holdings. When an income shock primarily

increases incomes derived from tradable assets, such as dividend incomes, actual wealth holdings increase by far more than desired wealth holdings, so that top earners borrow domestically and abroad, and the country runs a current account deficit (i.e., it becomes a net debtor in terms of its NFA/GDP ratio). When the shock primarily increases incomes not derived from tradable assets, such as labor incomes, actual wealth holdings increase by far less than desired wealth holdings, top earners lend domestically and abroad, and the country runs a current account surplus (i.e., the economy becomes a net creditor in terms of its NFA/GDP ratio). In both cases, the link between changes in NFA/GDP and inequality is mediated by a current account deficit or surplus.

The structure of the paper is as follows. Section 2 describes the database, the variables, their definitions, their information sources, and some stylized facts. Section 3 explains the econometric methodology. Section 4 presents the main findings. Section 5 introduces the conclusions.

2. Database, variables, definitions, information sources, and stylized facts

We use a panel dataset of five-year periodicity for 61, 64, 86, or 88 EMDEs, depending on different econometric specifications concerned over the 1970-2020 period. Table 1 summarizes the variables used in the paper and their corresponding sources. The period of analysis runs from 1970 through 2020 with intervals of five years with an unbalanced panel.

The dependent variables are the different proxies for the net external wealth of nations (Net Foreign Assets (NFA)/GDP, and Net International Investment Position (IIP)/GDP)) and have been elicited from the latest version of the database on External Wealth of Nations provided by Lane and Milesi-Ferretti: https://www.brookings.edu/research/the-external-wealth-of-nations-database/. Although the first empirical contributions to the study of the determinants of the external net wealth of nations usually employ the NFA/GDP ratio, some recent scholars use the IIP/GDP ratio to consider valuation effects. This last indicator is a more accurate measure of the net external wealth of nations and shows widespread use in the recent specialized literature. So, we decided to include both measures to get a more complete picture of this issue. We also use foreign assets to GDP (EA/GDP) and liabilities to GDP (EL/GDP) separately (note that NFA/GDP=EA/GDP-EL/GDP).

Inequality indicators come from the World Inequality Database in the case of the Top 1 and Top 10 and from the Standardized World Income Inequality Database in the case of the Gini disposable income.[8]

In addition, some control variables usually incorporated in related research works have been considered. Among the main determinants of net external wealth (NFA/GDP), scholars typically recognize the importance of the following variables: public debt as a percentage of GDP (as in Lane and Milesi-Ferretti, 2001), different demographic indicators (as in Lane and Milesi-Ferretti, 2001), trade openness (Jung and Kim, 2021), financial openness (Eichengreen et al., 2021), domestic credit to GDP (Jung and Kim, 2021), and the exchange rate regime (Fidora et al., 2017). These variables have been constructed on the Global Debt Database, the World Bank Database, the Chinn-Ito Database on financial openness, and the Iltzetzki et al. updated Database on exchange rate regimes: https://www.ilzetzki.com/irr-data.

To have an intuition about the relationship between indicators of the external wealth of nations and inequality, Figures 1-6 show simple correlations between two proxies for external wealth— NFA/GDP and IIP/GDP—, and three inequality measures—Top 1, Top 10, and Gini disposable income for a large sample of EMDEs. We can appreciate positive associations with large heterogeneity across countries. These figures have motivated us to evaluate this relationship in a long-run dynamic panel dataset context.

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[8] As Alvaredo (2011: 274) points out: "In a typical income distribution, the rich may appear insignificant. The most commonly used measure of inequality, the Gini coefficient, is more sensitive to transfers at the center of the distribution than at the tails. In a textbook-sized Lorenz curve, the top 0.1% or even the top 1% are scarcely distinguishable on the horizontal axis from the vertical endpoint. However, changes in top income shares are capable of impacting on changes in overall inequality significantly, as advanced by Atkinson (2007): "If we treat the very top group as infinitesimal in numbers, but with a finite share S of total income, then the Gini coefficient G can be approximated by $G*(1-S)+S$, where $G*$ is the Gini coefficient for the rest of the population" (p. 19). The relevance of the last expression has increased with the recent developments of the literature on top incomes (Atkinson and Piketty, 2007, 2010)".

Table 1. Variables, definitions, and information sources

Variable	Definition	Source
Top 1	Pre-tax national income Top 1 share	World Inequality Database (WID)
Top 10	Pre-tax national income Top 10 share	World Inequality Database (WID)
Gini disposable income	Coefficient Gini in household disposable (post-tax, post-transfer)	Standardized World Income Inequality Database (SWIID)
Total foreign assets/GDP, (EA/GDP)	Total financial claims on nonresidents, % of GDP	Own calculations based on Lane and Milesi-Ferretti´s updated Database
Total foreign liabilities/GDP, (EL/GDP)	Total financial liabilities, % of GDP	Own calculations based on Lane and Milesi-Ferretti´s updated Database
Net foreign assets/GDP, (NFA/GDP=EA/GDP-EL/GDP)	Total financial claims on nonresidents - Total financial liabilities, % of GDP	Own calculations based on Lane and Milesi-Ferretti´s updated Database
International investment position/GDP, (IIP/GDP)	Net International Investment Position as reported by country authorities (including gold), % of GDP	Own calculations based on Lane and Milesi-Ferretti's updated Database
Public debt	Total stock of debt liabilities issued by the central government, % of GDP	IMF Global Debt Database
Youth dependency ratio	Youth dependency ratio (% of working-age population)	World Bank Database
Trade openness	Exports + imports, % of GDP	World Bank Database
Financial openness	Chinn-Ito index	Chinn-Ito Database
Domestic credit to private sector/GDP	Domestic credit to the private sector, % of GDP	World Bank Database
Exchange rate regime	Dummy variable (1 if ERR is fixed)	Iltzetzki, Reinhart and Rogoff Database

Figure 1. External wealth indicators and inequality indexes. Simple averages for the entire sample. EMDEs. 1970-2020
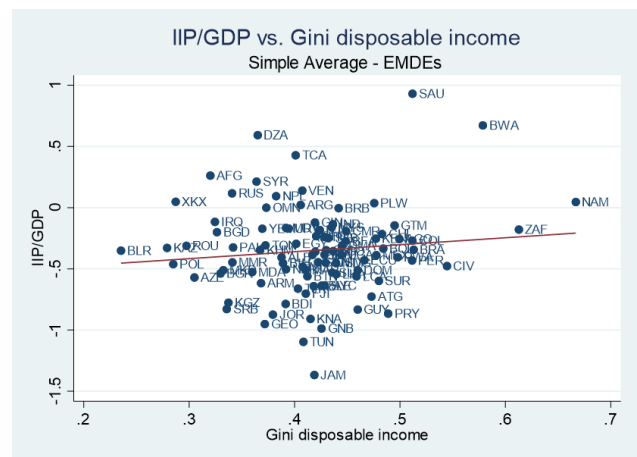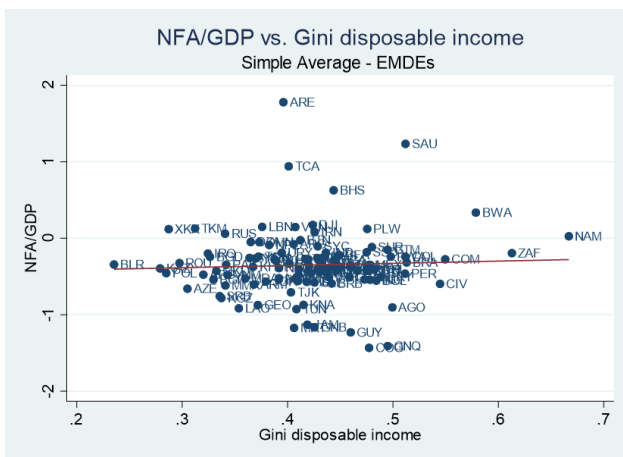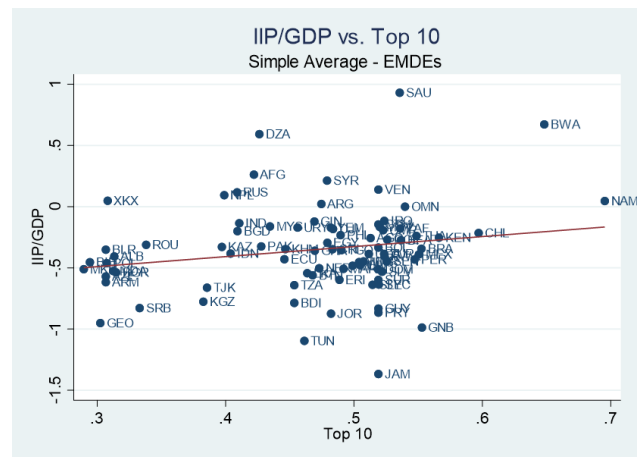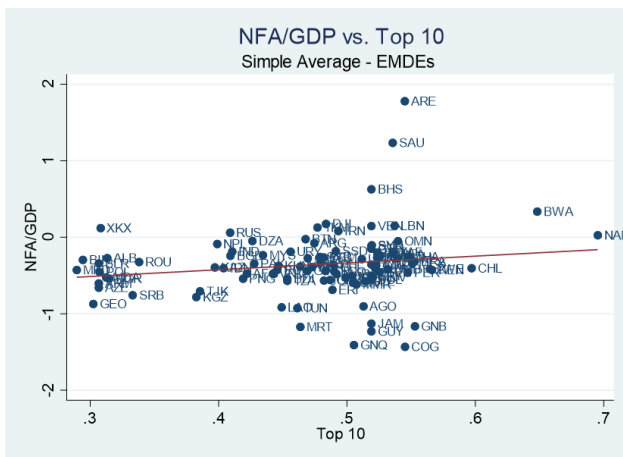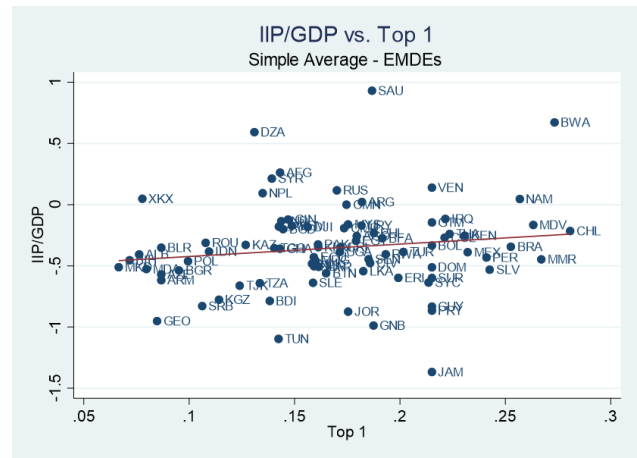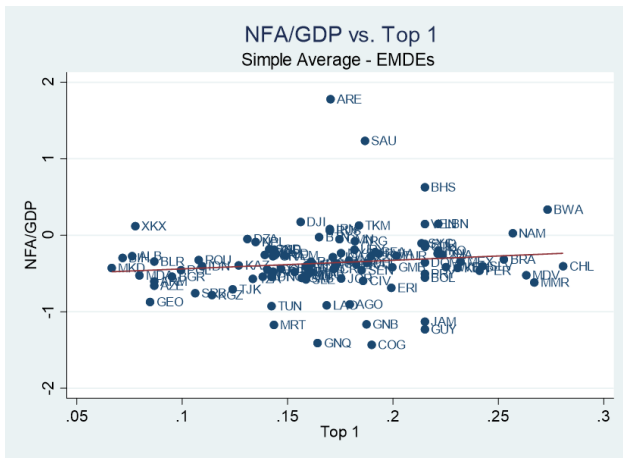
Notes: NFA/GDP is the Net Foreign Assets to GDP ratio. IIP/GDP is the Net International Investment Position to GDP ratio. The technical description of these two variables is provided in Section 3.

3. Econometric methodology

We use a dynamic specification that incorporates the dependent variable lagged one period. The autoregressive coefficient is highly significant and reflects persistence in the accumulation of net external wealth. In addition, income inequality evolves slowly over time since income distribution depends on the entire structure of the economy and shows high persistence. As a result, the exploration of the data confirms that the dynamic autoregressive panel dataset model is appropriate. Given the slow varying property of these variables, we consider five-year periodicity in the model.

The specification of the dynamic panel data model is given by:

$$y_{i,t} = \alpha + \beta y_{i,t-1} + \gamma I_{i,t} + \delta x_{i,t} + \zeta_t + \mu_i + \varepsilon_{i,t},$$

(1)

where $y_{i,t}$ includes the proxies for the net external wealth of each EMDEs in each year (NFA/GDP, IIP/GDP, EA/GDP, EL/GDP), $y_{i,t-1}$ indicates the first lag (i.e. five years lag) of each dependent variable, $x_{i,t}$ is the vector of control variables (public debt/GDP, demographic variable, trade openness, financial openness, domestic credit/GDP, and exchange rate regime); ζ_t is a time-fixed effects term, μ_i is a country fixed-effects term, and $\varepsilon_{i,t}$ is the idiosyncratic error term. It should be noted that while the control variables are country-specific and thus correspond to *pull factors*, the time dummies control for *push factors* that reflect the international financial conditions that affect the residents' portfolio decisions.

Our interest lies in evaluating the statistical significance and the sign of the coefficients of the variables $I_{i,t}$ that correspond to the different indicators of inequality (Top 1, Top 10, and Gini disposable income).

Making allowance for the possible dynamic bias of the panel, estimations have been assessed based on the System Generalized Method of Moments (SGMM) following Arellano and Bond (1991), and Blundell and Bond (1998). In this setup, the lagged values of the dependent variable and covariates are treated as endogenous, and they are used in the instruments set. The collapse instrument option is used based on Roodman (2009a, b) to avoid the potential effects of many instruments.

4. Results

4.1. Estimates for net foreign assets

The SGMM estimates for net foreign asset variables are shown in Table 2. Considering the large sample of countries, the model is close to the rule of thumb, whereby the number of instruments should be much larger than the number of countries under the estimations. In our case, the number of instruments is 88 while the number of countries varies from 66 to 88. The panel data is unbalanced with an average of about 5 five-year periods per country for NFA/GDP and 2.5 for IIP/GDP, but there is considerable heterogeneity across countries. This set up does not allow us to use large T panel data set techniques.

The Hansen tests for over-identifying restrictions cannot reject the null of valid instrument sets and it does not show a very high value suggesting many instruments. Finally, the AR(2) Arellano-Bond tests also confirm the validity of the SGMM implementation.

The estimated relationships are statistically significant and positive across the inequality indicators used (Top 1, Top 10, and Gini disposable income) and the proxies for net external wealth considered (NFA/GDP, and IIP/GDP). These results show that financialized elites have a higher propensity to accumulate net external wealth and to demand net foreign assets than the rest of the population.

It is noteworthy that the magnitude of the coefficients varies when considering the inequality indicators and their influence on the proxies for external wealth. For example, in the case of NFA/GDP, a greater effect is seen in the Top 10, followed by the Gini disposable income, and then by the Top 1. These results apply to EMDEs and could differ in the case of advanced countries.

Consider now the interpretation of the magnitude of the effects. Take for instance the coefficient of 0.45 in Table 2, Column (1), corresponding to the effect of Top 1 on NFA/GDP. If we assume that the Top 1 of the richest individuals in a given country increases their share by 1 percentage point (say from 10% to 11%, which in Top 1 units is 0.01) this will produce an average same-year increment in NFA/GDP of 0.0045, that is 0.45% in terms of the country GDP. The long-run effect is more than double in magnitude, as the same period effect should be multiplied by 0.0045/(1-0.57), that is, 1.05% of GDP. For the Top 10, the long-run effect increases tenfold, 0.0487/(1-0.58), 11.6%. Smaller but comparable effects correspond to IIP/GDP. The long-run effects should be taken with caution, as it is not feasible to model GDP growth together with net external wealth in a coherent long-run framework. That is, the estimator is valid in a local sense. Nevertheless, we can assume that the marginal effect is positive.

In short, the main empirical findings are robust both to two proxies for net external wealth and three indicators of income inequality is the existence of a statistically significant and positive association between these variables. This relationship is statistically significant for all income inequality measures and net external wealth variables at a 1% confidence level. In other words, a more regressive income distribution pattern relates to increases in the different proxies for the net external wealth of nations.

4.2. Disaggregation by foreign assets and liabilities

Table 3 considers SGMM estimates for the case of total foreign assets and liabilities, separately, as a percentage of GDP. For this case, there is heterogeneity across effects depending on the variable used to proxy inequality. For both assets and liabilities, the Top 1 inequality measure has a negative and significant effect, thus resulting in an increment of inequality that reduces both foreign assets and liabilities. For the Top 10, the results are both positive and statistically significant. Then, there is an interesting heterogeneity depending on the composition of the richest portion of the population to be used for the analysis. If any, the results indicate that the behavior of the financial elites varies depending on their relative positioning, showing an important distinction between the Top 1 and Top 10 portions of the income distribution. The Gini disposable income coefficient lies in between both measures as it has a positive effect on foreign assets and a negative one on foreign liabilities (note, however, that the autoregressive coefficient is larger than one, thus invalidating these estimates). In all cases, the point estimate magnitude does not contradict the results for the net foreign asset position. That is, if we consider the difference of the coefficient estimates for assets and liabilities (i.e., NFA/GDP=EA/GDP-EL/GDP), this results in the sign of the effects found in Table 2.

Table 2. Dynamic panel data model for net foreign assets. EMDEs. 1970-2020

	NFA/GDP			IIP/GDP		
	(1)	(2)	(3)	(1)	(2)	(3)
Top 1%	0.45***			2.09***		
	(0.07)			(0.25)		
Top 10%		4.87***			1.78***	
		(0.21)			(0.20)	
Gini disposable income			3.17***			2.07***
			(0.19)			(0.26)
Lag NFA/GDP	0.57***	0.58***	0.28***			
	(0.00)	(0.00)	(0.01)			
Lag IIP/GDP				0.24***	0.21***	0.14***
				(0.01)	(0.02)	(0.02)
Public debt/GDP	-0.37***	-0.29***	-0.42***	-0.73***	-0.73***	-0.69***
	(0.01)	(0.02)	(0.01)	(0.03)	(0.02)	(0.04)
Youth dependency ratio	-0.28***	-0.11	-0.03	0.11*	-0.17**	-0.17
	(0.06)	(0.07)	(0.04)	(0.07)	(0.07)	(0.11)
Trade openness	0.32***	0.35***	0.26***	-0.01	0.02	-0.07*
	(0.02)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
Financial openness (Chinn-Ito index)	-0.08***	-0.09***	-0.04***	-0.07***	-0.08***	-0.06***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Domestic credit/GDP	-0.00	0.00*	-0.00***	0.00***	0.00	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ERR regime (1 if ERR is fixed)	0.01	0.02	-0.06***	0.08***	0.07**	0.04
	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)	(0.03)
Observations	469	469	372	173	173	154
Number of countries	86	86	88	64	64	61
#IV	88	88	88	88	88	88
Hansen	68.06	64.03	70.10	47.08	44.53	33.39
Hansen p-val	0.577	0.709	0.508	0.987	0.994	1
AR2 stat	1.014	1.258	-1.476	-1.597	-1.588	-1.489
AR2 p-val	0.311	0.208	0.140	0.110	0.112	0.137
Obs. per group: min	1	1	1	1	1	1
Obs. per group: avg	5.453	5.453	4.227	2.703	2.703	2.525
Obs. per group: max	9	9	9	9	9	9

Notes: Cluster (by country) robust standard errors. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

86 EMDEs (Top 1 and Top 10, NFA/GDP): Albania, Algeria, Angola, Argentina, Armenia, Bahamas, Bahrain, Bangladesh, Belarus, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, Chile, Colombia, Comoros, Costa Rica, Cote d'Ivoire, Djibouti, Dominican Republic, Ecuador, El Salvador, Equatorial Guinea, Eritrea, Gabon, Gambia, Ghana, Guatemala, Guinea, Guinea-Bissau, Guyana, India, Indonesia, Iran, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Lao, Lebanon, Libya, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Mauritania, Mexico, Moldova, Morocco, Myanmar, Namibia, Nepal, Niger, Oman, Pakistan, Paraguay, Peru, Poland, Romania, Russia, Rwanda, Saudi Arabia, Senegal, Seychelles, Sierra Leone, South Africa, Sri Lanka, Suriname, Syria, Thailand, Togo, Tunisia, Turkey, Uganda, Uruguay, Venezuela, Vietnam, and Zimbabwe.

88 EMDEs (Gini disposable income, NFA/GDP): Albania, Algeria, Angola, Argentina, Armenia, Bahamas, Bangladesh, Barbados, Belarus, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, Chile, Colombia, Comoros, Costa Rica, Cote d'Ivoire, Djibouti, Dominican Republic, Ecuador, El Salvador, Fiji, Gabon, Gambia, Ghana, Guatemala, Guinea, Guinea-Bissau, Guyana, India, Indonesia, Iran, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Lao, Lebanon, Libya, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Mauritania, Mexico, Moldova, Morocco, Myanmar, Namibia, Nepal, Niger, Oman, Pakistan, Paraguay, Peru, Poland, Romania, Russia, Rwanda, Samoa, Saudi Arabia, Senegal, Seychelles, Sierra Leone, Solomon Islands, South Africa, Sri Lanka, Suriname, Syria, Thailand, Togo, Tonga, Tunisia, Turkey, Uganda, Uruguay, Venezuela, Vietnam, and Zimbabwe.

64 EMDEs (Top 1 and Top 10, IIP/GDP): Albania, Angola, Argentina, Armenia, Bahrain, Bangladesh, Belarus, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Chile, Colombia, Costa Rica, Cote d'Ivoire, Djibouti, Dominican Republic, Ecuador, El Salvador, Ghana, Guatemala, Guinea, Guinea-Bissau, India, Indonesia, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Macedonia, Madagascar, Malawi, Malaysia, Mali, Mexico, Moldova, Morocco, Myanmar, Namibia, Niger, Oman, Pakistan, Paraguay, Peru, Poland, Romania, Russia, Rwanda, Saudi Arabia, Senegal, Sierra Leone, South Africa, Thailand, Togo, Tunisia, Turkey, Uganda, Uruguay, and Venezuela.

61 EMDEs (Gini disposable income, IIP/GDP): Albania, Angola, Argentina, Armenia, Bangladesh, Belarus, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Chile, Colombia, Costa Rica, Cote d'Ivoire, Djibouti, Dominican Republic, Ecuador, El Salvador, Fiji, Ghana, Guatemala, Guinea-Bissau, India, Indonesia, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Macedonia, Madagascar, Malawi, Malaysia, Mali, Mexico, Moldova, Morocco, Myanmar, Namibia, Niger, Pakistan, Paraguay, Peru, Poland, Romania, Russia, Rwanda, Senegal, Sierra Leone, South Africa, Thailand, Togo, Tunisia, Turkey, Uganda, Uruguay, and Venezuela.

Table 3. Dynamic panel data model for foreign assets and liabilities. EMDEs. 1970-2020

	EA/GDP			EL/GDP		
	(1)	(2)	(3)	(1)	(2)	(3)
Top 1%	-2.82***			-2.89***		
	(0.46)			(0.39)		
Top 10%		3.04***			2.09***	
		(0.39)			(0.66)	
Gini disposable income			1.05**			-4.51***
			(0.47)			(0.53)
Lag EA/GDP	0.85***	0.85***	1.38***			
	(0.00)	(0.00)	(0.01)			
Lag EL/GDP				0.84***	0.84***	1.18***
				(0.00)	(0.00)	(0.01)
Public debt/GDP	-0.04	0.08***	0.71***	0.32***	0.39***	0.52***
	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.04)
Youth dependency ratio	0.92***	1.15***	0.63***	1.18***	1.19***	-0.47***
	(0.16)	(0.21)	(0.10)	(0.16)	(0.19)	(0.12)
Trade openness	1.97***	1.99***	0.34***	2.07***	1.96***	-0.71***
	(0.07)	(0.06)	(0.06)	(0.07)	(0.07)	(0.05)
Financial openness (Chinn-Ito index)	-0.04**	-0.07***	0.03***	0.02	0.01	0.07***
	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)
Domestic credit/GDP	0.02***	0.02***	0.00***	0.02***	0.02***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ERR regime (1 if ERR is fixed)	0.83***	0.75***	-0.10***	0.89***	0.80***	-0.06***
	(0.06)	(0.06)	(0.01)	(0.07)	(0.08)	(0.02)
Observations	469	469	372	470	470	373
Number of countries	86	86	88	86	86	88
#IV	88	88	88	88	88	88
Hansen	69.84	71.55	65.52	73.63	70.92	71.34
Hansen p-val	0.517	0.459	0.661	0.392	0.480	0.466
AR2 stat	-1.502	-1.487	-0.775	0.964	0.961	-0.336
AR2 p-val	0.133	0.137	0.438	0.335	0.337	0.737
Obs. per group: min	1	1	1	1	1	1
Obs. per group: avg	5.453	5.453	4.227	5.465	5.465	4.239
Obs. per group: max	9	9	9	9	9	9

Notes: Cluster (by country) robust standard errors. * p<0.1, ** p<0.05, *** p<0.01. See notes to Table 2.

86 EMDEs (Top 1 and Top 10, NFA/GDP): Albania, Algeria, Angola, Argentina, Armenia, Bahamas, Bahrain, Bangladesh, Belarus, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, Chile, Colombia, Comoros, Costa Rica, Cote d'Ivoire, Djibouti, Dominican Republic, Ecuador, El Salvador, Equatorial Guinea, Eritrea, Gabon, Gambia, Ghana, Guatemala, Guinea, Guinea-Bissau, Guyana, India, Indonesia, Iran, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Lao, Lebanon, Libya, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Mauritania, Mexico, Moldova, Morocco, Myanmar, Namibia, Nepal, Niger, Oman, Pakistan, Paraguay, Peru, Poland, Romania, Russia, Rwanda, Saudi Arabia, Senegal, Seychelles, Sierra Leone, South Africa, Sri Lanka, Suriname, Syria, Thailand, Togo, Tunisia, Turkey, Uganda, Uruguay, Venezuela, Vietnam, and Zimbabwe.

88 EMDEs (Gini disposable income, NFA/GDP): Albania, Algeria, Angola, Argentina, Armenia, Bahamas, Bangladesh, Barbados, Belarus, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, Chile, Colombia, Comoros, Costa Rica, Cote d'Ivoire, Djibouti, Dominican Republic, Ecuador, El Salvador, Fiji, Gabon, Gambia, Ghana, Guatemala, Guinea, Guinea-Bissau, Guyana, India, Indonesia, Iran, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Lao, Lebanon, Libya, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Mauritania, Mexico, Moldova, Morocco, Myanmar, Namibia, Nepal, Niger, Oman, Pakistan, Paraguay, Peru, Poland, Romania, Russia, Rwanda, Samoa, Saudi Arabia, Senegal, Seychelles, Sierra Leone, Solomon Islands, South Africa, Sri Lanka, Suriname, Syria, Thailand, Togo, Tonga, Tunisia, Turkey, Uganda, Uruguay, Venezuela, Vietnam, and Zimbabwe.

5. Conclusions

This article contributes to the research agenda of the study of the determinant of the net external wealth of nations inaugurated by Lane and Milesi-Ferretti's paper in 2001. It adds to the list of potential determinants of external balance sheets of EMDEs' different income inequality indicators. The paper contributes both in terms of variables (NFA/GDP, IIP/GDP, EA/GDP, EL/GDP, Top 1, Top 10, Gini disposable income) and provides methodological improvements regarding the Lane and Milesi-Ferretti's empirical estimation strategy to get some novel and robust empirical results.

The study empirically corroborates the existence of a statistically significant and positive relationship between different indicators of inequality and two proxies for the net external wealth of nations. This link is statistically significant for all income inequality measures and net external wealth variables at a 1% confidence level. The main findings show that inequality is positively associated with an increment in net external wealth. Our results are robust to different proxies of income inequality and different ways of measuring external wealth. The paper also finds heterogeneity in terms of the behavior of the richest portions of the population in terms of foreign assets and liabilities, when taken separately. The results indicate that there is large heterogeneity in the financial arrangements of the elites.

Consider now the interpretation of the magnitude of the effects. If the Top 1 of the richest individuals in a given country increments their share by 1 percentage point this will produce an average same-year increment in NFA of 0.45% in terms of the country's GDP. The long-run effect is more than double in magnitude (1.05% of GDP). For the Top 10, the long-run effect increases tenfold (11.6% of GDP).

To sum up, financialized elites have a higher propensity to accumulate wealth and demand net foreign assets when income inequality goes up. In EMDEs, economic agents who show the capacity to accumulate assets prefer foreign ones as a way of diversifying exchange rate risk and financial volatility. A higher financial opening facilitated the possibility of diversifying the portfolios of residents through a greater opening of the capital account. Financial liberalization also allows households and firms to carry out regulatory arbitrage in case of progressive taxes. In other words, financial deregulation eases investing abroad to diversify risk and increase profitability. The increase in NFA/GDP and IIP/GDP could be the product of channeling the greater savings of high-income groups in a diversified manner, but it could also reflect a reaction to redistributive policies based on increasing taxes on the most favored sectors.

This paper can be extended in several directions. First, our database covers a panel dataset of EMDEs, but there could be large heterogeneity among different subsamples. Moreover, this relationship may also be of interest to advanced countries for which there could be different effects and dynamics. Second, the paper can be extended by evaluating international capital flows of different types. This may highlight the channels through which financial elites accumulate net external wealth. Third, our empirical findings can be better explained using an integrated structural macroeconomic model, once the difficulty in modeling inequality and assets composition is sorted.

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