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Does income inequality really matter for credit booms?

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Abstract

The central question of this paper is whether income inequality causes credit booms along with other factors. We distinguish between different types of credit boom: real estate, household, and firms' credit booms, as well as credit booms that turn into crises. Using a sample of 70 countries between 1990 and 2016, we find that income inequality does not cause credit booms in our global sample. When splitting the data by income level, we find that income inequality is a determinant of credit booms turning into crisis in high income countries. Capital inflows increase the likelihood of credit boom occurrence and countries experiencing high economic growth tend to have more credit booms. Finally, in countries with fixed exchange rate regimes, credit booms are more frequent.

JEL Classification Numbers: E24, E44, F41, G20, J21.

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1 Introduction

In his seminal work, Rajan (2010) suggests that the rise of income inequality in the US provided incentives for financial regulators to encourage lending to poor households, creating a credit boom that eventually burst and leading to the 2007-8 global financial crisis. Several papers that have investigated Rajan's hypothesis, with different datasets and methodologies, provided contradictory results. Some find a positive impact of income inequality on credit growth (Chang et al. 2020; Kirschenmann, Malinen, and Nyberg 2016; Perugini, Hölscher, and Collie 2015; Yamarik, El-Shagi, and Yamashiro 2016), whilst others do not prove any significant relation (Atkinson and Morelli 2011; Bordo and Meissner 2012).

Credit booms can lead to thinking about more access to finance and, therefore, to greater opportunities for investment and economic growth. However, the evidence does always not give support to this thinking. The empirical literature shows that credit growth is a powerful predictor of financial crises (Berkmen et al. 2012; Bordo and Meissner 2012; Claessens et al. 2010; Schularick and Taylor 2012) with one in three credit booms followed by a financial crisis (Dell'Ariccia et al. 2016). Credit booms that are considered as good booms, start with a positive long term shock to productivity growth, whilst with bad booms this positive shock disappears quickly and turns into crises (Gorton and Ordonez 2016). Also, credit booms can be classified when they meet certain conditions, such as real estate credit booms (Crowe et al. 2011), household credit booms and non financial corporate sector credit booms (T. Beck et al. 2012).

In this paper, we explore whether income inequality is a determinant of different types of credit boom, not only ones that turn into crises, whilst allowing for institutional characteristics (E. Mendoza and Terrones 2008). The main question addressed is: Does income inequality cause credit booms? We test this question at a global level, at a country income group level and at a financial development group level.

This topic is also of interest globally and regionally, in particular for the Euro-Mediterranean. This region comprises developing and developed countries in a small geographical area, with different levels of income, financial development and social inequality. The region also suffers from a severe migration problem across countries, due to economic difficulties and political instability.

The contribution of this paper is to test if Rajan's hypothesis holds. We are the first to explore the impact of income inequality on the likelihood of

occurrence of different types of credit boom, using a global dataset. Other researchers investigate this relationship on smaller samples and without differentiating between the types of credit boom, instead focussing on credit booms that turn into financial crisis.

The focus is on different types of boom, as classified by Dell’Ariccia et al. (2016): credit booms associated with real estate prices, household credit booms, corporate non-financial sector credit booms and bad credit booms (associated with financial crises).

We provide evidence that income inequality does not cause credit booms, including booms that turn into financial crises, when testing on a global sample. When splitting our sample by income level, we find that in high-income countries inequality causes credit booms that turn into credit crises.

The paper is structured as follows: Section 2 reviews the literature on credit booms and income inequality. Section 3 describes the data and methodology adopted. The penultimate section shares the results, whilst the final section provides a conclusion and suggests certain policy implications.

2 Literature Review

Researchers and policy makers have a growing interest in the determinants of credit booms and their impact on the economy. Our paper focusses on whether income inequality is a determinant of different types of credit boom, including ones that turn into financial crises. To identify credit booms, most papers use the gap of the country’s credit to GDP ratio, or real credit per capita to its nonlinear trend, with different approaches (Dell’Ariccia et al. 2016; Gourinchas, Valdés, and Landerretche 2001; Mendoza and Terrones 2012; Mendoza and Terrones 2008). In this paper, we primarily use the Dell’Ariccia et al. (2016) definition of credit booms. This paper is related to three trends in the economic literature: The relationship between credit growth and economic growth, the drivers of credit booms and the finance inequality nexus.

The financial sector can contribute to economic growth, by providing economic opportunities and employment to the lower income population (Ayadi et al. 2019; Čihák and Sahay 2020). Credit growth, being a part of a financial sector’s development can either be a powerful predictor of financial crises (Mendoza and Terrones 2008; Schularick and Taylor 2012) or of economic growth. Evidence shows that a firm’s credit expansion can lead to positive growth, whilst households credit does not necessarily drive positive growth (Beck et al. 2012).

Regarding the drivers of credit booms, some macro-economic factors have been identified. Mendoza and Terrones (2012) find that during credit booms, macroeconomic variables (such as production and absorption, asset prices, real exchange rates, capital inflows, and external deficits) display a clear cyclical pattern of economic expansion in the upswing, followed by a steep contraction in the downswing for both advanced and emerging market economies. Their paper also proves that credit booms often follow surges in capital inflows, total factor of productivity gains, as well as financial reforms. Furthermore, they are far more common with managed than flexible exchange rates. Also, Dell’Ariccia et al. (2012) find that, in addition to financial reforms, capital inflows associated with capital account liberalisation and periods of strong economic growth are empirically associated with credit booms. However, Gourinchas, Valdés, and Landerretche (2001) argue that with domestic investment booms, an increase in domestic interest rates, a worsening current account, declines in reserves and a decline in output growth all determine the occurrence of booms. Whilst focussing on middle and low income countries, findings show that capital inflows and a deviation from the country’s economic fundamentals are drivers of credit booms (Arena et al. 2015).

In this paper, we focus on inequality as a driver of credit booms. Rajan (2011) associates the increase in income inequality with the occurrence of the credit boom that burst into the US financial crisis 2008-09. He argues that the political response to the rise of income inequality in the 2000s was to expand credit, especially housing credit. This approach, specific to the US, is tested empirically by Yamarik et al. (2016) who find a significant positive long-term relationship between income inequality and real estate lending. These findings were supported by several studies (Crowe et al. 2011; Kumhof, Rancière, and Winant 2015). Nevertheless, Bordo and Meissner, (2012) did not find sufficient evidence to support the claim of causality between income inequality and credit booms leading to financial crises. Instead, they found boom bust patterns are driven by low interest rates and strong growth. Kirschenmann, Malinen, and Nyberg (2016), with a dataset of 14 developed countries between 1870 and 2008, show that income inequality has a predictive power on the occurrence of financial crisis. And Perugini, Hölscher, and Collie (2015) in a study of 18 OECD countries between 1970 and 2007, show that income concentration leads to high private sector indebtedness.

The causality of income inequality to the different types of credit boom is debatable, especially when credit booms do not turn into crises. Kumhof et al. (2015) show that high leverage and crises are endogenous results of the increase in income inequality. Similarly, Atkinson and Morelli (2011) use data between 1911 and 2010 to identify patterns of rising inequality and

financial crises. Their data from a 100-year observation of 25 countries does not support the causality of inequality with the occurrence of financial crises. And empirical research outside the US has also mitigated these results.

This paper examines the impact of a country's income inequality and other macro-economic variables on the likelihood of credit boom occurrence. It contributes to the existing literature on the nexus between inequality and finance, whilst differentiating between the types of credit boom. This paper includes a large sample of 70 countries between 1990 and 2016, with different levels of income and financial development.

3 Empirical analysis

3.1 The sample and variables

Using a global database, at a country level we investigate the occurrence of different types of credit boom. The data is collected via the World Bank's database, the SWIID database, the International Monetary Fund database and International Financial Statistics data files for the period 1990-2016.

We adopt Dell'Ariccia et al. (2016)'s definition of a credit boom that is "*an episode in which the ratio of credit to GDP grows faster than what is implied by its trend, which follows the normal pace of credit growth in that particular country*". We explore all countries available in the World Bank database. We compare the credit to GDP ratio in each year t and country i to a backward looking, country specific cubic trend estimated between years $t-10$ and t . The boom episode is considered as boom (dummy 1) when either of the two conditions is verified: (1) The deviation from trend is greater than 1.5 times its standard deviation and the annual growth rate of the credit to GDP ratio exceeds 10% or (2) the annual growth rate of the credit to GDP ratio exceeds 20%. We also use Dell'Ariccia et al.'s (2016) identification of the different types of credit boom: credit booms associated with house price booms, booms that occurred in the household sector, ones at the non-financial corporate sector and those that erupted and turned into financial crisis, classified as bad booms. Bad booms have one of the following criteria: (1) they are followed by a financial crisis within three years; or (2) they are associated with a recession or an inferior medium-term growth performance (below medium trend of the log real GDP).

To assess inequality, we use the most recent SWIID database indicator, the post-tax post transfer Gini, as the estimate of household disposable income inequality. A Gini equal to one means perfect inequality and zero perfect equality. The reason for choosing this variable as a measure of income

inequality is that it has a high correlation with all the different existing indicators for income inequality involving a large country coverage.

The control variables are designated according to the literature of determinants of credit booms (Decressin and Terrones, 2011; Dell’Ariccia, Igan, Laeven, and Tong, 2016; Magud, Reinhart, and Vesperoni, 2012; Mendoza and Terrones, 2008). The factors associated with credit booms are the growth of GDP, capital inflows and the level of financial reform. The growth of GDP leads to an increase in investment within a country with a higher probability of credit booms. Capital inflows, as a result of capital liberalisation, allow higher levels of funds in banks and banks therefore facilitate their credit conditions. Financial reforms¹ allow greater financial integration which increases credit aggregates. A fixed interest rate regime can lead to credit contraction, since maintaining the peg is a priority (Montiel and Reinhart 2001).

To allow for the Kuznets effect, we use the GDP per capita ratio (Kuznets 1955). We also allow for structural and internal variables: inflation, current account balance, trade openness and bank orientation. Bank orientation captures the size and importance of banking intermediation within a country. The data definitions and sources are exposed in Table 1. The sample examined is between 1990 and 2016, using global data to include 70 countries, as summarised in Table 2.

We then try to understand from our data the presence of credit booms with their different types, in Table 3.

Credit booms associated with an increase in the price of real estate, occur more in countries with high income levels or that are financially developed. A possible explanation of this result is that real estate developers are likely to use the available leverage to finance their projects. Credit booms associated with household leverage are the most common type of credit boom in our dataset. Such booms are composed of household credit related to consumption and housing, and they are more likely to occur in high income and financially developed countries. For the Euro Mediterranean area, these types of credit boom occur the most. Firm credit booms are equally distributed amongst high-income and low-income countries. But financially developed countries allow greater access to finance for firms and, therefore, have an increased likelihood of an occurrence of credit booms related to firms. Regarding credit booms that turn into financial crises, the data shows that these occur more in low-income countries and in financially developed ones.

¹Financial reform indicators include several dimensions of reform: credit controls and reserve requirements, interest rate controls, entry barriers, state ownership, policies on securities markets, banking regulations, and restrictions on the capital account.

3.2 The methodology

To study the impact of inequality on different types of credit boom, we apply logistic regression analyses. We run the regressions whilst clustering per country, to have 70 country observations between 1990 and 2016. We allow for collinearity, homoscedasticity and normality using robust Eicker-Huber-White standard errors. The choice of the logistic regression is related to the nature of the dependent variables (dummy variables) with the value of 1 when the boom occurs and 0 otherwise, as defined by Dell’Ariccia, Igan, Laeven, and Tong, (2016). As a first step, we use the linear specification between income inequality and credit booms (eq. 1).

$$\Pr(\text{Boom } i, t) = F_L(\alpha + \beta \text{Gini}_{i,t} + \delta X_{i,t}) \quad (\text{eq. 1})$$

Where F_L is the cumulative logistic function, $F_L = \frac{1}{1+e^{-z}}$, $\text{Boom } i, t$ is a dummy variable of 1 in the case of a boom occurrence, 0 otherwise in country j at period t that has been identified as boom periods and 0 otherwise. Five types of booms are considered as dependent variable: Boom (not related to any type examined); the boom of real estate credit, the boom related to household private credit, the firm credit boom and the boom followed by a financial crisis, considered as bad boom. Gini is the level of income inequality in country j at period t . $X_{i,t}$ is a vector of control variables being: GDP per capita, capital inflows, financial reform, inflation, current account balance, trade openness, the exchange rate regime, bank orientation, tax revenue to GDP and Government transfers.

We then run the regressions with the linear specifications whilst considering the interaction with the countries’ income levels (High-income and Low-income levels), as suggested by the World Bank² (eq. 3) and with the levels of financial development (Low level and High level)³ using Svirydzhenka’s (2016) financial development index. (eq. 4)

$$\Pr(\text{Boom } i, t) = F_L(\alpha + \beta_1 \text{Gini}_{i,t} + \beta_2 \text{Gini} \times \text{IncomeLevelGroup}_{i,t} + \delta X_{i,t}) \quad (\text{eq. 2})$$

$$\Pr(\text{Boom } i, t) = F_L(\alpha + \beta_1 \text{Gini}_{i,t} + \beta_2 \text{Gini} \times \text{FDLevelGroup}_{i,t} + \delta X_{i,t}) \quad (\text{eq. 3})$$

² The categorisation of the income level is based on the normalised GDP per capita level.

³ The categorisation of the level of financial development is specified by considering the median of financial development score. Low levels are below the median, whilst high levels are above it.

To address the specificities of the Euro-Mediterranean area⁴, we apply the linear specification, whilst introducing the interaction with dummy variable EU-Med (eq.5).

$$\Pr(\text{Boom } i, t) = F_L(\alpha + \beta_1 \text{Gini}_{i,t} + \beta_2 \text{Gini} \times \text{EUMed}_{i,t} + \delta X_{i,t})$$

(eq. 4)

To address the dynamics of inequality, we run the equation (1), whilst using the Gini index with a dynamic approach. We compute for the 5 previous years of the Gini moving average. This approach allows us to test whether the persistence of inequality can engender credit booms.

$$\Pr(\text{Boom } i, t) = F_L(\alpha + \beta_{5Y} \text{Gini}_{i,t} + \delta X_{i,t}) \quad (\text{eq. 5})$$

4 Empirical Results

The results are organised per type of credit boom and by applying the five equations above. Table 4 studies the booms not differentiated by types, table 5 focusses on real estate booms, table 6 focusses on household credit booms, table 7 exposes the results of firm credit booms and table 8 shows the results of the regressions for credit booms that turn into financial crisis (bad booms). The regressions have the highest levels of R squared whilst determining the real estate credit booms (ranging from 0.32 to 0.33) and for bad booms (ranging from 0.22 to 0.24). We focus primarily on the income inequality as a determinant of credit booms and then we discuss the remaining determinants.

Whilst investigating the impact of income inequality on the different types of credit boom, the results show that inequality does not drive credit booms. In Table 4, income inequality does not significantly affect the likelihood of an occurrence of credit booms. This finding holds when we differentiate between income level, financial development level and when focussing on a specific region, such as the Euro Mediterranean. When we use the 5-year Gini indicator, the finding of no significant relation between income inequality and credit booms still holds. This result holds for all the types of credit boom. The real estate credit booms are not impacted by income inequality (Table 5) and this result holds for the different equations. When tackling the consumption and housing credits that are classified as household credit booms, income inequality does not drive the rise in credit booms either

⁴ The countries included in the Euro-Mediterranean region are: Algeria, Cyprus, Egypt, France, Greece, Israel, Italy, Jordan, Lebanon, Libya, Malta, Morocco, Portugal, Spain, Syria, Tunisia, Turkey and Palestine (West Bank and Gaza). The booms occurring in that area are exposed in appendix 2.

(Table 6). The same results are also confirmed for firm credit booms (Table 7). Finally, the results of Table 8 prove that income inequality does not drive the occurrence of bad credit booms that generate a financial crisis. The results are in line with the findings of Bordo and Meissner (2012) and Mendoza and Terrones (2012). However, income inequality is only a determinant of bad booms in the case of high-income countries (Table 8, eq. 2) with a positive and significant coefficient (p-value lower than 0.05). Even though bad credit booms occur less in high-income countries (Table 3), when they do, income inequality is a main driver. This result shows that Rajan's (2010) hypothesis holds only in the case of high-income countries. It is also in accordance with the findings of Chang et al. (2020) whilst studying OECD countries.

Concerning the control variables, GDP growth, capital inflows and the exchange rate regime are significant determinants of credit booms. GDP growth has a significantly positive impact on the likelihood of occurrence of all types of credit boom (positive significant coefficient for equations 1 to 5 from Tables 4 to 8). Economic growth is a sign of growing investments, consumption and real estate, that need financing, hence credit growth (Levine 2005). Also, capital inflow is a significant predictor of all types of credit boom (positive and significant coefficient for equations 1 to 5 from Tables 4 to 8). Capital inflow allows an abundance of deposits, leading to more credit facilities (Reinhart and Reinhart 2008). The results also suggest that countries with fixed or managed exchange rate regimes, have a lower likelihood of credit expansion, hence a credit boom (negative and significant coefficient except for household credit booms). Such regimes have conservative credit policies because their priority is to maintain the peg (Montiel and Reinhart 2001). Financial reform is a significant predictor for real estate credit booms (significant coefficient for equations 1 to 5 in Table 5). Financial reform associated with financial liberalisation increases the attractiveness of investments in a country, hence favouring credit booms. This result is in accordance with the findings of Dell'Araccia et al. (2016). The remaining control variables, GDP per capita, inflation, current account balance, trade openness and bank orientation, are not significant in the determination of the likelihood of occurrence of different types of credit boom. For robustness checks, we test the regressions again, using the Gini market (inequality pre-tax and pre-transfer estimate) and including the government transfers and tax revenue capturing the redistribution effect, for which the previous results hold.⁵

⁵ Available upon request

5 Conclusion

This paper investigates whether income inequality is a determinant of different types of credit boom. It contributes to the debate on the credit growth and income inequality nexus. Previous studies have examined this relation for small samples of developed countries (Perugini, Hölscher, and Collie, (2015) and Chang et al. (2020) only OECD countries; Kirschenmann, Malinen, and Nyberg (2016) 8 countries and Bordo and Meissner (2012) 8 countries). The paper contributes in three ways: a) it provides a global coverage including developing and developed countries; b) it covers the period between 1990 and 2016; and c) it differentiates between different types of credit boom.

Based on data from 70 countries between 1990 and 2016, using logistic regressions, we find that income inequality does not lead to credit booms, regardless of the type of boom. This result is in line with the conclusions of Bordo and Meissner (2012) and Atkinson and Morelli (2011). However, the findings also suggest that income inequality is a determinant of credit booms erupting into a financial crisis but only in high-income countries. This proves that Rajan's hypothesis, stating that income inequality drives bad credit booms (i.e. excess of credit leading to financial crises), only applies to high-income countries.

Additionally, GDP growth, capital inflows and fixed exchange rates are important factors in the rise of credit booms. Also, financial reforms have a positive significant impact on the occurrence of real estate credit booms.

From a policy perspective, the recommendations depend on the characteristics of the individual countries. For high-income level countries, when policy makers observe an increase in income inequality accompanied by credit expansion, it can indicate the likelihood of the occurrence of a financial crisis. Therefore, when economic indicators are healthy (positive economic growth and increased capital inflows) but the gap between the rich and poor grows, policy makers should consider tightening macroeconomic policy and activating macro prudential tools, whilst activating tax and social policies to reduce inequalities. Policy makers must also engage in financial reforms in all countries to promote healthier credit expansion. Concerning countries with fixed exchange rate regimes, these attract capital inflows due to higher interest rates (Montiel and Reinhart 2001). Capital inflows and central bank sterilisation as a means of maintaining the exchange rate, can favour credit expansion via bank intermediation (Magud, Reinhart, and E.R. Vesperoni 2012). Therefore, authorities should be very attentive and monitor how credit is expanding, in a way that fosters growth and avoids financial crises.

6 List of tables

6.1 Table 1: Data sources

Variable	Source	Remarks
Gini (post tax post transfers)	Solt, 2016	Computed as average of the Gini net of SWIID
Boom	Computation according to Dell'ariccia (2016)	Dummy variables (detail of computation in the method)
Credit and house price boom		
Bad Boom		
Household credit boom		
Firm credit boom		
GDP per capita	World Bank database	GDP per capita is gross domestic product divided by mid-year population.
Capital inflows	World Bank database	Sum of direct, other and portfolio investment flows as per cent of GDP
Financial reform index	Abiad, Detragiache, and Tresselt (2008)	A normalised index, with higher values indicating a more liberal and standardised regulatory framework
Inflation	International Monetary Fund, International Financial Statistics and data files.	Inflation, consumer prices (annual %)
Current account balance	International Monetary Fund, Balance of Payments Statistics Yearbook and data files, and World Bank and OECD GDP estimates.	A record of a country's international transactions with the rest of the world
Trade openness	World bank database	Sum of exports and imports divided by GDP.
Exchange rate regime	Reinhart and Rogoff (2004)	Exchange rate regime higher values corresponding to more flexibility in exchange rate determination
Bank orientation	Computation according to Dell'ariccia (2016)	Bank orientation is a dummy variable that takes the value of 1 if the ratio of bank credit-to-GDP over the sum of bank

		credit- to-GDP plus stock market capitalisation of listed companies as a percentage of GDP is greater than the median of the ratio across first year boom observations.
Income level	Classification of Atlas	We divide the income level in two groups: High and Low. The upper middle-income level is considered with the high group and the lower middle-income level is considered in the low level group.
Level of financial development	Svirydzenka (2016)	We use the aggregated financial development (FD) score per country as defined by Svirydzenka (2016), and the countries having a score below the median are countries with low level of FD and above the median are considered countries with high level of FD

6.2 Table 2: Descriptive statistics

Variable	Obs	Mean	Std. Dev.
Gini net	2 287	37.747	9.200
5 year average growth of domestic credit	5 851	-1.881	62.990
Boom	2 181	0.134	0.341
Credit and house price boom	2 287	0.032	0.177
Household credit boom	2 287	0.127	0.333
Firm credit boom	2 287	0.091	0.288
Bad Boom	2 614	0.074	0.262
GDP per capita	2 249	8.007	1.593
GDP growth	2 141	3.954	5.932
Capital inflows	2 109	2.552	4.986

Financial reform	1 236	0.689	0.218
Inflation	2 231	10.038	11.732
Current account balance	2 240	-2.064	10.091
Trade openness	2 237	79.865	40.897
Exchange rate regime	2 184	7.630	4.165
Bank orientation	1 390	0.613	0.487
Tax revenue to GDP	3 524	16.732	7.070
Government transfers (to expenses)	2 836	37.936	20.114

6.3 Table 3: Credit booms per type

Number of year-obs	Boom	Real estate boom	Household boom	Firm Boom	Bad boom
High-income countries	135	60	230	169	87
Low-income countries	156	14	60	156	106
Countries with high level of financial development	171	58	231	172	107
Countries with low level of financial development	117	15	54	35	83
Euro-Mediterranean countries	41	14	53	32	24

6.4 Table 4: Determinants of credit booms (all types)

	(1)	(2)	(3)	(4)	(5)
	Boom	Boom	Boom	Boom	Boom
Gini net	0.0154	-0.000855	0.0405	0.0139	
	(0.81)	(-0.04)	(1.46)	(0.71)	
Gini net X High-income		0.0360			

level		(1.09)			
High-income level dummy		-1.248			
		(-0.96)			
Gini net X High-level of financial development		-0.0390			
		(-0.90)			
High-level of financial development country		1.203			
		(0.64)			
EU-Med country dummy		-3.357			
		(-0.82)			
Gini net X EU-Med country		0.102			
		(0.89)			
5 year average Gini net				0.0118	
				(0.63)	
GDP per capita	0.0254		0.0433	0.0268	0.0158
	(0.14)		(0.17)	(0.14)	(0.09)
GDP growth	0.102***	0.0965**	0.105***	0.103**	0.102***
	(3.33)	(3.19)	(3.35)	(3.27)	(3.33)
Capital inflows	0.193***	0.191***	0.200***	0.197***	0.194***
	(6.83)	(6.75)	(6.69)	(6.66)	(6.79)
Financial reform	-1.382	-1.257	-1.401	-1.362	-1.373
	(-1.08)	(-1.40)	(-1.07)	(-1.05)	(-1.07)
Inflation	0.0254	0.0242	0.0216	0.0251	0.0255
	(1.47)	(1.40)	(1.12)	(1.64)	(1.46)
Current account balance	0.000702	0.000431	0.00222	0.00927	0.00106
	(0.06)	(0.03)	(0.18)	(0.86)	(0.09)

Trade openness	0.00421	0.00426	0.00475	0.00385	0.00400
	(1.14)	(1.25)	(1.16)	(0.96)	(1.09)
Exchange rate regime	-0.176***	-0.176***	-0.173***	-0.180***	-0.175***
	(-3.94)	(-4.01)	(-3.78)	(-4.14)	(-3.93)
Bank orientation	-0.221	-0.164	-0.199	-0.187	-0.227
	(-0.69)	(-0.48)	(-0.61)	(-0.57)	(-0.71)
Intercept	-2.019	-1.282	-3.042	-2.021	-1.797
	(-1.16)	(-1.03)	(-1.48)	(-1.16)	(-1.04)
N	892	892	892	892	892
Countries					
Pseudo R-sq	0.211	0.213	0.216	0.215	0.210

t statistics in parentheses * p<0.05 ** p<0.01 *** p<0.001

6.5 Table 5: Determinants of real estate credit booms

	(1)	(2)	(3)	(4)	(5)
	Real Estate Boom	Real Estate Boom	Real Estate Boom	Real Estate Boom	Real Estate Boom
Gini net	-0.0896	-0.139	-0.0865	-0.0889	
	(-1.79)	(-1.36)	(-0.98)	(-1.75)	
Gini net X High-income level		0.113			
		(0.95)			
High-income level dummy		-3.926			
		(-0.94)			
Gini net X High-level of financial development			-0.00695		
			(-0.06)		

High-level financial development country	of			0.421				
				(0.10)				
EU-Med dummy	country							-0.0312
								(-0.01)
Gini net X EU-Med country								-0.00148
								(-0.01)
5 year average Gini net								-0.0850
								(-1.85)
GDP per capita		-0.267		-0.304		-0.260		-0.265
		(-0.89)		(-0.92)		(-0.81)		(-0.84)
GDP growth		0.180**	0.178**	0.181*		0.180**		0.182**
		(2.73)	(2.80)	(2.50)		(2.77)		(2.66)
Capital inflows		0.131*	0.123*	0.130*		0.131*		0.126*
		(2.53)	(2.16)	(2.29)		(2.54)		(2.39)
Financial reform		4.099*	3.185*	4.105*		4.107*		4.114*
		(2.45)	(2.18)	(2.46)		(2.54)		(2.47)
Inflation		0.0223	0.0142	0.0256		0.0216		0.0230
		(0.34)	(0.24)	(0.48)		(0.33)		(0.36)
Current account balance		-0.0225	-0.0229	-0.0222		-0.0237		-0.0234
		(-0.89)	(-0.88)	(-0.89)		(-1.06)		(-0.93)
Trade openness		-0.00499	-0.00374	-0.00528		-0.00534		-0.00445
		(-0.82)	(-0.63)	(-0.78)		(-0.72)		(-0.71)
Exchange rate regime		-0.404***	-0.365***	-0.405***		-0.406***		-0.411***
		(-3.98)	(-4.43)	(-3.99)		(-3.85)		(-3.91)
Bank orientation		-0.425	-0.420	-0.415		-0.436		-0.444

	(-0.86)	(-0.88)	(-0.83)	(-0.85)	(-0.90)
Intercept	0.149	0.150	0.219	0.125	-0.0457
	(0.04)	(0.04)	(0.04)	(0.03)	(-0.01)
N	922	922	922	922	922
Countries					
Pseudo R-sq	0.327	0.332	0.327	0.327	0.326

t statistics in parentheses * p<0.05 ** p<0.01 *** p<0.001

6.6 Table 6: Determinants of household credit boom

	(1)	(2)	(3)	(4)	(5)
	Household credit boom	Household credit boom	Household credit boom	Household credit boom	Household credit boom
Gini net	-0.00228	-0.0532	-0.0364	-0.000850	
	(-0.08)	(-1.23)	(-0.82)	(-0.03)	
Gini net X High-income level		0.0593			
		(1.17)			
High-income level dummy		-1.698			
		(-0.82)			
Gini net X High-level of financial development			0.0448		
			(0.97)		
High-level of financial development country			-1.611		
			(-0.85)		
EU-Med country dummy				3.405	
				(0.54)	
Gini net X EU-Med				-0.0993	

country					(-0.57)
5 year average Gini net					-0.000745 (-0.03)
GDP per capita	0.307 (1.33)		0.319 (1.11)	0.285 (1.20)	0.313 (1.34)
GDP growth	0.107*** (3.34)	0.0962** (3.19)	0.108** (3.27)	0.105*** (3.30)	0.107*** (3.35)
Capital inflows	0.0760** (2.19)	0.0643* (1.92)	0.0726** (2.05)	0.0759** (2.19)	0.0758** (2.17)
Financial reform	1.792 (1.27)	2.593* (1.84)	1.846 (1.31)	1.721 (1.22)	1.785 (1.26)
Inflation	-0.0496 (-1.40)	-0.0517 (-1.39)	-0.0469 (-1.49)	-0.0523 (-1.40)	-0.0497 (-1.40)
Current account balance	-0.00922 (-0.52)	-0.00610 (-0.33)	-0.00910 (-0.52)	-0.0138 (-0.86)	-0.00933 (-0.53)
Trade openness	0.00109 (0.19)	0.000105 (0.02)	0.000374 (0.07)	0.00207 (0.34)	0.00114 (0.19)
Exchange rate regime	-0.0821 (-1.58)	-0.0857* (-1.67)	-0.0867 (-1.61)	-0.0750 (-1.28)	-0.0823 (-1.58)
Bank orientation	-0.360 (-0.95)	-0.327 (-0.87)	-0.374 (-0.99)	-0.370 (-0.97)	-0.355 (-0.94)
Intercept	-5.214* (-1.85)	-1.287 (-0.63)	-4.013 (-1.31)	-5.106* (-1.83)	-5.321* (-1.85)
N	922	922	922	922	922
Countries					
Pseudo R-sq	0.152	0.155	0.155	0.155	0.152

t statistics in parentheses * p<0.05 ** p<0.01 *** p<0.001

6.7 Table 7: Determinants of firm credit booms

	(1)	(2)	(3)	(4)	(5)
	Firm credit boom	Firm credit boom	Firm credit boom	Firm credit boom	Firm credit boom
Gini net	-0.0396	-0.0910	-0.135	-0.0334	
	(-1.10)	(-1.48)	(-1.48)	(-0.95)	
Gini net X High-income level		0.0600			
		(0.86)			
High-income level dummy		-1.974			
		(-0.71)			
Gini net X High-level of financial development			0.113		
			(1.20)		
High-level of financial development country			-3.415		
			(-1.00)		
EU-Med country dummy				4.784	
				(1.30)	
Gini net X EU-Med country				-0.151	
				(-1.41)	
5 year average Gini net					-0.0297
					(-0.82)
GDP per capita	0.270		0.219	0.282	0.303
	(1.14)		(0.72)	(1.18)	(1.24)

GDP growth	0.0909*	0.0788	0.0982*	0.0878*	0.0903*
	(2.14)	(1.96)	(2.12)	(2.07)	(2.13)
Capital inflows	0.116**	0.102*	0.106**	0.115**	0.114**
	(2.95)	(2.55)	(2.60)	(2.97)	(2.93)
Financial reform	1.365	2.297	1.531	1.152	1.354
	(0.90)	(1.53)	(0.95)	(0.73)	(0.89)
Inflation	-0.00413	-0.00724	0.00753	-0.00716	-0.00452
	(-0.13)	(-0.22)	(0.24)	(-0.21)	(-0.14)
Current account balance	-0.00344	-0.00144	-0.00570	-0.0160	-0.00369
	(-0.16)	(-0.06)	(-0.26)	(-0.79)	(-0.18)
Trade openness	0.00221	0.00126	0.000320	0.00287	0.00263
	(0.41)	(0.24)	(0.05)	(0.49)	(0.49)
Exchange rate regime	-0.135*	-0.138*	-0.140*	-0.137*	-0.136*
	(-2.37)	(-2.44)	(-2.32)	(-2.20)	(-2.40)
Bank orientation	-0.226	-0.219	-0.275	-0.235	-0.207
	(-0.77)	(-0.74)	(-0.90)	(-0.82)	(-0.70)
Intercept	-3.894	-0.203	-0.467	-3.998	-4.554
	(-1.21)	(-0.08)	(-0.10)	(-1.28)	(-1.37)
N	922	922	922	922	922
Countries					
Pseudo R-sq	0.163	0.162	0.178	0.171	0.160

t statistics in parentheses * p<0.05 ** p<0.01 *** p<0.001

6.8 Table 8: Determinants of bad booms

	(1)	(2)	(3)	(4)	(5)
	Bad boom	Bad boom	Bad boom	Bad boom	Bad boom
Gini net	0.0169	-0.0282	0.0233	0.0130	
	(0.67)	(-0.85)	(0.65)	(0.48)	
Gini net X High-income level		0.101*			
		(2.36)			
High-income level dummy		-3.760*			
		(-2.21)			
Gini net X High-level of financial development			-0.00292		
			(-0.06)		
High-level of financial development country			-0.431		
			(-0.19)		
EU-Med country dummy				-9.099	
				(-1.73)	
Gini net X EU-Med country				0.260	
				(1.86)	
5 year average Gini net					0.0105
					(0.43)
GDP per capita	0.0289		0.123	0.0759	0.0123
	(0.13)		(0.43)	(0.32)	(0.05)
GDP growth	0.113**	0.100**	0.115**	0.115**	0.113**
	(2.84)	(2.59)	(2.97)	(2.70)	(2.84)
Capital inflows	0.242***	0.237***	0.248***	0.256***	0.243***
	(5.34)	(5.23)	(5.40)	(5.43)	(5.32)

Financial reform	-0.712	-0.374	-0.782	-0.771	-0.697
	(-0.47)	(-0.30)	(-0.51)	(-0.51)	(-0.46)
Inflation	0.0311	0.0271	0.0239	0.0270	0.0314
	(1.33)	(1.17)	(0.97)	(1.57)	(1.35)
Current account balance	0.0142	0.0142	0.0163	0.0327*	0.0148
	(0.61)	(0.51)	(0.67)	(2.36)	(0.63)
Trade openness	-0.00160	-0.000808	-0.000911	-0.00325	-0.00202
	(-0.31)	(-0.17)	(-0.18)	(-0.55)	(-0.39)
Exchange rate regime	-0.138*	-0.138*	-0.139*	-0.160**	-0.138*
	(-2.22)	(-2.29)	(-2.26)	(-2.63)	(-2.22)
Bank orientation	0.147	0.336	0.187	0.239	0.132
	(0.38)	(0.76)	(0.48)	(0.57)	(0.34)
Intercept	-3.521	-1.816	-4.206	-3.602	-3.117
	(-1.36)	(-0.93)	(-1.55)	(-1.38)	(-1.24)
N	892	892	892	892	892
Countries					
Pseudo R-sq	0.230	0.245	0.235	0.246	0.229

t statistics in parentheses * p<0.05 ** p<0.01 *** p<0.001

References

1. Abiad, Abdul, Enrica Detragiache, and Thierry Tressel. 2008. *A New Database of Financial Reforms*.
2. Arena, Marco et al. 2015. IMF Working Paper *Credit Booms and Macroeconomic Dynamics: Stylised Facts and Lessons for Low-Income Countries*.
3. Atkinson, Anthony, and Salvatore Morelli. 2011. "Economic Crises and Inequality." *Human Development Research Paper* 5: 112–15.
4. Ayadi, Rym, Sami Ben Naceur, and Mohamed Goaid. 2019. "Financial Development and Employment: New Evidence." *EMNES Working Paper* March(25).
5. Beck, T., B. Büyükkarabacak, F. Rioja, and N. Valev. 2012. "Who Gets the Credit? And Does It Matter? Household vs. Firm Lending Across Countries." *The B.E. Journal of macroeconomics* 12(1): 1–46.
6. Beck, Thorsten, B. Buyukkarabacack, F.K Rioja, and N. Valev. 2012. "Who Gets the Credit? And Does It Matter? Household versus Firm Lending across Countries." *Journal of macroeconomics* 12(1): 1–44.
7. Berkmen, S Pelin, Gaston Gelos, Robert Rennhack, and James P Walsh. 2012. "Berkmen, S.P., Gelos, G., Rennhack, R., Walsh, J.P., The Global Financial Crisis: Explaining Cross-Country Differences in the Output Impact." *Journal of International Money and Finance* 31(1): 42–59.
8. Bordo, Michael D, and Christopher M Meissner. 2012. "Does Inequality Lead to a Financial Crisis?" 31: 2147–61.
9. Chang, Xiao, Guoqiang Li, Xinhua Gu, and Chunyu Lei. 2020. "Does the Inequality-Credit-Crisis Nexus Exist? An Empirical Re-Examination." *Applied Economics* 52(37): 4044–57.
10. Čihák, M, and Ratna Sahay. 2020. "Finance and Inequality." *IMF Staff Discussion Note* January.
11. Claessens, Stijn, Giovanni Dell’Ariccia, Deniz Igan, and Luc Laeven. 2010. "Cross-Country Experiences and Policy Implications from the Global Financial Crisis." *Economic Policy* 25(62): 267–293.
12. Crowe, C.W, Deniz Igan, Giovanni Dell’Ariccia, and P. Rabanal. 2011. "How to Deal with Real Estate Booms: Lessons from Country Experiences." *IMF Working Papers*.
13. Decressin, J., and M. Terrones. 2011. September World Economic Outlook *Credit Boom-Bust Cycles: Their Triggers and Policy Implications*.
14. Dell’Ariccia, Giovanni et al. 2012. "Policies for Macrofinancial Stability: How to Deal with Credit Booms." *IMF Staff Discussion Note* (August): 1–46.
15. Dell’Ariccia, Giovanni, Deniz Igan, Luc Laeven, and Hui Tong. 2016. "Credit Booms and Macrofinancial Stability." *Economic Policy*: 299–357.

16. Gorton, Gary, and Guillermo Ordóñez. 2016. "Good Booms, Bad Booms." *NBER Working Paper w222008*(February).
17. Gourinchas, Pierre Olivier, Rodrigo Valdés, and Oscar Landerretche. 2001. "Lending Booms: Latin America and the World." *NBER Working Papers* 8249.
18. Kirschenmann, Karolin, Tuomas Malinen, and Henri Nyberg. 2016. "The Risk of Financial Crises: Is There a Role for Income Inequality?" *Journal of International Money and Finance* 68: 161–80.
19. Kumhof, Michael, Romain Rancière, and Pablo Winant. 2015. "Inequality , Leverage , and Crises." *American Economic Review* 105(3): 1217–45.
20. Kuznets, Simon. 1955. "Economic Growth and Income Inequality." *The American Economic Review* 45(1): 1–28.
21. Levine, Ross. 2005. "Law, Endowments and Property Rights." 19(3): 61–88.
22. Magud, N.E., C.M. Reinhart, and E.R. Vesperoni. 2012. "Capital Inflows, Exchange Rate Flexibility, and Credit Booms." *IMF Working Paper* 12/41.
23. Mendoza, Enrique G, and Marco E Terrones. 2012. "An Anatomy of Credit Booms and Their Demise." *NBER Working Paper*. <http://www.nber.org/papers/w18379>.
24. Mendoza, Enrique, and Marco Terrones. 2008. "An Anatomy of Credit Booms and Their Demise." *NBER Working Papers*.
25. Montiel, P., and Carmen M. Reinhart. 2001. "The Dynamics of Capital Movements to Emerging Economies During the 1990s." In *Short-Term Capital Flows and Economic Crises*,.
26. Perugini, Cristiano, Jens Hölscher, and Simon Collie. 2015. "Inequality, Credit and Financial Crises." *Cambridge Journal of Economics* 40(1): 227–57.
27. Rajan, Raghuram G. 2010. *Fault Lines: How Hidden Fractures Still Threaten the World Economy*. Princeton University Press.
28. ———. 2011. *Fault Lines: How Hidden Fractures Still Threaten the World Economy*. Princeton University Press.
29. Reinhart, Carmen M., and Vincent R. Reinhart. 2008. "Capital Flow Bonanzas: An Encompassing View of the Past and Present." *NBER International Seminar on Macroeconomics* 5(1): 9–62.
30. Reinhart, Carmen M., and Kenneth S. Rogoff. 2004. "The Modern History of Exchange Rate Arrangements: A Reinterpretation." *Quarterly Journal of Economics* 119(1): 1–48.
31. Schularick, Moritz, and Alan M. Taylor. 2012. "Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870-2008." *American Economic Review* 102(2): 1029–61.
32. Solt, Frederick. 2016. "The Standardised World Income Inequality Database." *Social Science Quarterly*.

-
33. Svirydzenka, Katsiaryna. 2016. *Introducing a New Broad-Based Index of Financial Development*.
 34. Yamarik, Steven, Makram El-Shagi, and Guy Yamashiro. 2016. "Does Inequality Lead to Credit Growth? Testing the Rajan Hypothesis Using State-Level Data." *Economics Letters* 148: 63–67.

7 Appendixes

Appendix 1: Pearson Correlation table (only printed the significant correlation starting at 0.1)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Gini net	1																
2 Gini market	0.7573	1															
3 5 Y Gini net	0.7588	0.957	1														
4 5 Y growth of domestic credit	0.0837	0.1161	0.1012	1													
5 Boom				-0.0671	1												
6 Credit and house price boom	-0.0868				0.4757	1											
7 Household credit boom	-0.1382				0.2298	0.4427	1										
8 Firm credit boom	-0.1304				0.2429	0.4406	0.5787	1									
9 Bad Boom				-0.0917	0.7909	0.3519	0.1826	0.1959	1								
10 GDP per capita	-0.4437	-0.0489	-0.0706			0.1343	0.2901	0.2534		1							
11 GDP growth	0.0535			-0.0753	0.1352	0.1026	0.0775	0.0561	0.1147	-0.1341	1						
12 Capital inflows		-0.0503	-0.0681		0.2355	0.1251	0.1131	0.1329	0.2357	-0.1126	0.1054	1					
13 Financial reform	-0.1791	0.2374	0.2778	0.0671		0.1276	0.2868	0.2233		0.6546		-0.0836	1				
14 Inflation	0.1619	0.0467		-0.087	-0.0756	-0.0815	-0.1817	-0.1347	-0.039	-0.3136	-0.2231	0.0424	-0.5419	1			
15 Current account balance	0.0482	0.0913	0.1137			-0.0493				0.0827	0.09	-0.2307	0.2393	-0.2419	1		
16 Trade openness	-0.1121	-0.0493	-0.0707	-0.0682	0.0852	0.0538	0.0513	0.0407	0.0756	0.0898	0.0867		0.0762			1	
17 Exchange rate regime		-0.0366	-0.0833		-0.1189	-0.114	-0.0628	-0.0686	-0.0757	-0.0364	-0.1001		-0.1804	0.4062	-0.1324	-0.1555	1
18 Bank orientation	-0.1514	-0.1399	-0.1545			-0.0579	-0.0923	-0.0536			-0.0853	0.0782	-0.1929		-0.0938	0.0903	-0.1916



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