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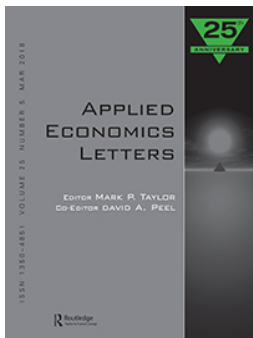
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ARTICLE

Does the impact of financial liberalization on income inequality depend on financial development? Some new evidence

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ABSTRACT

Instead of empirically finding that higher levels of financial development reduce the positive impact of financial liberalization on inequality, as others do, we come up with the opposite result: financial development strengthens the inequality-raising impact of financial liberalization. We suggest that by, e.g., allowing financial liberalization to lead to more volatility and uncertainty, the model of Bumann and Lensink (2016 "Capital Account Liberalization and Income Inequality." *Journal of International Money and Finance* 61: 143–162.) can be extended as such that also an amplifying instead of reducing effect of financial depth on the impact of financial liberalization on income inequality can be theoretically justified.

I. Introduction

Income inequality within most advanced, emerging markets and developing countries has increased, but there is no consensus yet about its causes. One factor that has received some attention in recent literature is the impact of financial liberalization on income inequality. Financial liberalization refers to a reduction in the role of government and an increase in the role of financial markets (Abiad, Oomes, and Ueda 2008). Using the financial liberalization index of Abiad, Detragiache, and Tressel (2010), some recent studies (Agnello, Mallick, and Sousa 2012; Delis, Hasan, and Kazakis 2014; Li and Yu 2014) report that financial liberalization reduces income inequality but Jaumotte and Osorio Buitron (2015), Naceur and Zhang (2016) and de Haan and Sturm (2017) conclude that financial liberalization increases inequality.

Two other recent studies focus on capital account liberalization. Furceri and Loungani (2015) analyse the effect of capital account liberalization on income inequality using a variety of channels. Their empirical findings suggest that capital account liberalization increases income inequality. Further, they condition the impact of financial liberalization on the level of financial depth. Their results show a mitigating effect of financial depth on the relationship of liberalization and inequality. Similarly, Bumann and Lensink (2016) report empirical evidence suggesting that capital account liberalization only tends to lower-income inequality in case of a sufficiently high level of financial depth.[1] Thus, financial depth reduces the increasing impact of financial liberalization on income inequality.

In their theoretical model, Bumann and Lensink (2016) assume that financial liberalization increases bank efficiency and thereby reduces borrowing costs. To restore equilibrium in the financial market, deposit rates will increase. An increase in the deposit rate improves the income of savers – who on average have lower income levels than investors – and thereby reduces income inequality. This conclusion is based on the assumption that the increase of deposit rates in absolute terms outweighs the decrease in lending rates. By having the interest rate elasticity of loan demand increase with the financial depth of a country, loan demand will increase more in those countries where financial depth is high implying a stronger reduction in inequality. However, this conclusion is not obvious. For instance, if financial liberalization leads to more volatility and uncertainty making low-income agents

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This article was originally published with errors. This version has been corrected. Please see corrigendum (https://doi.org/10.1080/13504851.2017.1324673).
[1]Bumann and Lensink (2016) claim that a sufficiently high level of financial depth, measured by private credit over GDP, exceeds 25%.

accumulate additional precautionary savings, it is possible that deposit rates would actually fall, thereby increasing income inequality. Hence, by extending the model in this (or other) direction(s), it is feasible to detect an amplifying instead of a reducing effect of financial depth on the impact of financial liberalization on income inequality. So, theoretically, the relationships we are interested in are ambiguous.

We re-examine the impact of financial liberalization on income inequality using a panel fixed effects model for a large sample of countries covering 1975–2005, thereby focusing on within-country developments of income inequality. As dependent variable, we use 5-year averages of Gini coefficients based on households' gross income from Solt's (2009) Standardized World Income Inequality Database (SWIID). Using both an index of financial liberalization based on the index of Abiad, Detragiache, and Tressel (2010) and the Chinn-Ito index of capital account liberalization (Chinn and Ito 2006; Chinn and Ito 2008), we find that financial liberalization is associated with increases in income inequality. The inequality-increasing impact of financial liberalization is significantly higher if financial development is higher.

II. Model and data

Following previous studies, we employ the data of Abiad, Detragiache, and Tressel (2010) that is based on seven sub-indices mostly pertaining to banking regulatory practices measured on a scale from 0 to 3 (fully repressed to fully liberalized). Our first measure of financial liberalization is the sum of six sub-indices. As the sub-index on banking supervision is not about financial sector liberalization, we exclude it. Our sample for which we use this proxy for financial liberalization consists of 89 countries and runs from 1975 to 2005.

As an alternative, and following Furceri and Loungani (2015) and Bumann and Lensink (2016), we employ the Chinn-Ito index for capital account openness as a more narrow measure of financial liberalization. Chinn and Ito (2006, 2008) base this index on the binary dummy variables that codify the

tabulation of restrictions on cross-border financial transactions reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions. It therefore can be considered as a de jure measure of capital account liberalization. Our sample for which we use this proxy for financial liberalization consists of 141 countries and runs from 1975 to 2005.

Our left-hand side variable is the Gini coefficient based on households' income from Solt's (2009) SWIID. We use the index that represents household income before taxes, as this shows inequality exclusive of fiscal policy. The SWIID database is the most comprehensive database and allows comparison across countries, because it standardizes income. The Gini coefficient is derived from the Lorenz curve and ranges between 0 (perfect equality) and 100 (perfect inequality). We acknowledge that the Gini coefficient is less than perfect and that other measures, such as the share of income of the lowest quintile, may sometimes be more appropriate. Data availability, however, dictates the choice. We construct averages of the Gini coefficients across 5 years where the Gini coefficients are centred at the middle of the 5-year period.[2]

We measure financial development by private credit divided by GDP. This measure excludes credit to the central bank, development banks, the public sector, credit to state-owned enterprises, and cross claims of one group of intermediaries on another. Thus, it captures the amount of credit channelled from savers, through financial intermediaries, to private firms.

As we are interested in the within country relationship between finance and income inequality, we use a panel model instead of OLS cross-section regressions. The model estimated is

$$Ineq_{i,t} = \alpha_i + \alpha_1 FD_{i,t-1} + \alpha_2 FL_{i,t-1} + \alpha_3 FD_{i,t-1} \times FL_{i,t-1} + \alpha_4 X_{i,t} + u_{i,t}$$

where $Ineq$ is income inequality, FD is financial development, FL is financial liberalization and X is a vector of control variables, while u denotes the error term. Time lags are used to avoid endogeneity issues. For FD and FL, we take values at the end of the 5-year period preceding the period

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[2] We use 5-year nonoverlapping averages for several reasons (de Haan and Sturm 2017). First, annual macroeconomic data are noisy, and this applies especially for data on income inequality. Second, the annual income inequality data in Standardized World Income Inequality Database are imputed for years for which no information was available in the underlying databases (there are only infrequent measures of inequality for much of Africa, Latin America and Asia). Third, we are not so much interested in short-term-driven, i.e. business cycle, effects.

covered by the Gini coefficient (which is a 5-year average). We have used a very long list of control variables based on previous studies and refer to de Haan and Sturm (2017) for details.

III. Estimation results

Table 1 presents the results where we proceed as follows. As our two finance measures may be related (e.g. a low level of financial development may be an incentive for countries to introduce financial liberalization), we first show simple bivariate regressions before including both finance measures simultaneously. In the next step, we add the interaction term. To interpret the interaction effect, we use graphs as suggested by Brambor, Clark, and Golder (2006).[3] In the first four columns of Table 1, the measure for financial liberalization based on Abiad, Oomes, and Ueda (2008) is used, while in the last four columns in Table 1, we proxy financial liberalization by the Chinn-Ito index measuring a country's degree of capital account openness.

The results suggest that financial development and financial liberalization increase income inequality independent of whether they are included separately or simultaneously. This is in line with the findings of de Haan and Sturm (2017).

Next, we turn to the interaction of financial liberalization and financial development. The line in Figure 1 shows the marginal impact of financial liberalization on income inequality for different levels of financial development. The whiskers show the confidence band and the bars show the distribution of the observations. The graphs are based on the estimates reported in columns (4) and (8) of Table 1. The graphs in Figure 1 suggest that the level of financial development conditions the impact of financial liberalization on income inequality: the positive impact of financial liberalization on the Gini coefficient is higher if financial development is higher. This conclusion holds for both measures of financial liberalization.

IV. Concluding remarks

The impact of financial liberalization on inequality seems to be conditioned by the level of financial development. However, instead of finding that this conditioning effect is negative implying that higher levels of financial development reduce the positive impact of financial liberalization on inequality, as suggested by Bumann and Lensink (2016), we find the opposite result: financial development strengthens the inequality-raising impact of financial liberalization, i.e. financial liberalization increases inequality in particular in those countries in which the level of financial development is already high. The results suggest that the aforementioned uncertainty argument within the framework of Bumann and Lensink (2016) is plausible.

Table 1. Explaining income inequality using financial development and financial liberalization (Abiad et al. and Chinn-Ito data).

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Abiad et al. financial liberalization index				Chinn-Ito capital account openness index			
	No interaction		+Interaction		No interaction		+Interaction	
Domestic credit (% of GDP)	0.0652***		0.0524***	−0.0189	0.0585***		0.0510***	0.0372***
	(5.089)		(4.251)	(−0.564)	(4.785)		(4.390)	(2.790)
Index		0.256***	0.146***	0.00456		0.804***	0.436***	0.0807
		(4.153)	(2.891)	(0.0584)		(3.768)	(2.642)	(0.322)
Domestic credit × index				0.00420** (2.364)				0.00897** (1.984)
Observations	426	426	426	426	569	569	569	569
R	0.173	0.111	0.202	0.229	0.139	0.062	0.155	0.166
Number of countries	89	89	89	89	141	141	141	141
Hausman test (p-value)	0.0955	0.484	0.195	0.0295	0.00755	0.123	0.0157	0.0017
F-test on domestic credit (p-value)				0.00001				0.000002
F-test on index (p-value)				0.00163				0.00327

Notes: Country-fixed effects are included. SEs are clustered at the country level. Robust t-statistics are in parentheses.
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

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[3]As a robustness check, we have also added several control variables. Most of the control variables considered are not significant. Only a dummy variable indicating whether a systemic banking crisis started in the preceding 5-year period, an index measuring civil liberties, and the degree of political globalization turn out to be significant for both measures of financial liberalization. Adding controls, however, does not change our conclusions and are therefore not shown. These results are available upon request.
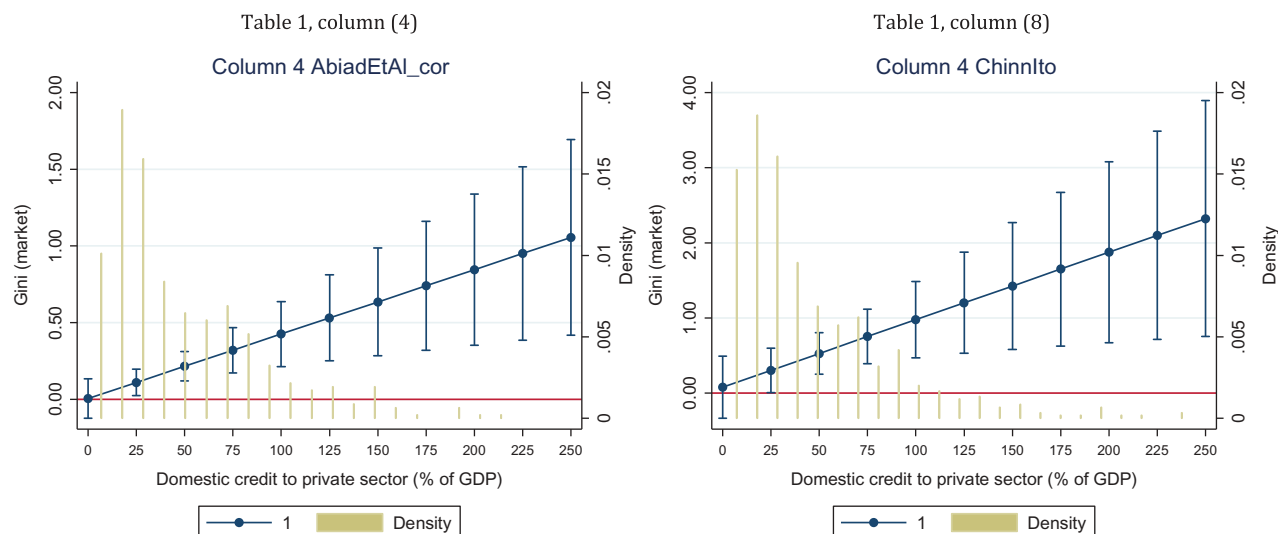
Figure 1. Effect of financial liberalization on income inequality conditional on financial development.

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