

The role of fiscal policy in the link between income inequality and banking crises

Nicholas Apergis, University of Derby, UK,

ABSTRACT

This paper explores the link between income inequality and banking crises, when inequality is affected by fiscal policy. Using a two-stage probit least squares method and a panel of 21 countries, spanning the period 1971-2017, the findings indicate that inequality impacts the probability of banking crises through budget deficits, followed by government expenses.

KEYWORDS: banking crises; income inequality; fiscal policy; panel data

JEL CLASSIFICATION: E62; E25; G21

I. Introduction

Based on Kirschenmann et al. (2016), who explore certain financial and macroeconomic variables as potential predictors of financial crises, the goal is to explore, for the first time, the role of fiscal instruments as a mechanism for the link between income inequality and banking crises. Income inequality potentially motivates policymakers to activate redistribution mechanisms through substantial government expenditure, tax effects, or budget deficits (Meltzer and Richard, 1981), which can influence growth (Persson and Tabellini, 1994). The presence of fiscal deficits, along with rising interest rates, could depress growth and, thus, induce banking crises by undermining banks' stability.

The paper touches two strands of the literature. First, the association between income inequality and financial crises (Rajan, 2010). The literature generated certain studies on the 'Rajan hypothesis', considering the role of households' indebtedness as a driver of banking crises (Krugman, 2007; Stiglitz, 2012). The reader should check a survey by Bazillier and Hericourt (2017), as well as certain empirical studies, i.e. Bordo

and Meissner (2012), Perugini et al. (2016) and Bellettini et al. (2019). Their findings document that income inequality positively affects the occurrence of banking crises. No study so far has explicitly tested potential mechanisms that explain this nexus, such as fiscal policy, as our work does.

The paper is also associated with the literature that links fiscal policy and inequality. Kitao (2010) explores whether fiscal policy and rebate transfers can stimulate economic activity, change the incentives to work and save, which in turn improve the welfare of households and inequality conditions. Muinelo-Gallo and Roca-Sagalés (2011) examine the impact of different fiscal instruments on income inequality across 43 countries, finding that government expenses reduce inequality without harming output. Rawdanowicz et al. (2013) document the impact of fiscal policy on equity across OECD countries. They highlight that in about half of their cases, the Gini index increased, potentially reflecting increasing dispersion of income and less redistribution of taxes and transfers. Agnello and Sousa (2014) use 18 industrialized countries and illustrate that inequality increases during periods of fiscal consolidation, primarily through spending cuts. Ball et al. (2013) also find that both expenses- and taxed-based policies increase inequality for a panel of OECD countries.

II. Data

The analysis uses annual data across 21 countries (Australia, Belgium, Brazil, Canada, Chile, China, Finland, France, Germany, Hong Kong, Iceland, India, Ireland, Israel, Italy, Japan, Mexico, Netherlands, Spain, the UK, the US), spanning the period 1971-2017. Banking crises are defined as a dummy variable equal to 1 in the first year of a banking crisis, and 0 otherwise. Banking crises dates come from Laeven and Valencia (2013). For the countries under consideration and the same time span, their paper identifies 81 banking crises.

Income inequality is measured as the Gini index, ranging from 0 to 1, where 0 supports perfect equality, and 1 total inequality. Additional controls are real GDP (at 2005 prices), real GDP per capita, terms of trade (export to import prices), real interest rates (nominal rates, i.e. 3-month T-bill rates, minus inflation), consumer price index, money supply (M2), foreign exchange reserves, depreciation rates, the ratio of bank credit to the private non-financial sector to GDP, the credit regulation index, the labour

market regulation index, the business regulation index (all ranging from 0 to 10-higher numbers imply more deregulation), real house price index, share price index, tax revenues as a share of GDP, government expenses as a share of GDP, budget deficit as a percentage of GDP, trade openness (the ratio of the sum of exports and imports to GDP), and financial development (credit to the non-financial private sector to GDP-King and Levine, 1993). All controls are in US dollars. Data are obtained from Datastream; regulation indexes come from FreetheWorld and Gini data come from SWIID (Solt, 2009).

III. Empirical analysis

A second-generation panel unit root test recommended by Pesaran (2007) tests the null hypothesis of a unit root. The results are reported in Table A1 in the Appendix and support the presence of a unit root across all panel variables. Next, the estimates through a two-stage probit least squares method are provided. The model yields:

Equation 1 (The inequality equation)

$$\text{Inequality}_{it} = a_i + \delta z_{it} + \eta_{it}$$

where z is a vector of controls, δ denotes a vector of coefficients, a denotes country fixed effects, and η is the error term (for methodological issues see also the Appendix).

Equation 2 (The probit/banking crises equation)

$$\text{Prob}(\text{crisis}_{it} = 1 | x_{it}) = 1 / [1 + \exp(-x_{it}'\beta)]$$

where crisis is a binary variable equal to 1 if a banking crisis occurs, and 0 otherwise, x is a vector of controls, and β is a vector of parameters to be estimated.

Table 1 and in reference to Panel 1 shows the estimates of the inequality equation (variables are in logs). Specifications (1), (2) and (3) include government expenses, tax revenues and budget deficit/surplus as a proxy for fiscal variables, respectively, and when only GDP per capita is included as an additional control variable, while specifications (4), (5) and (6) include all the remaining controls. The estimations indicate high persistency in income inequality, i.e. the lagged Gini index is positive and significant across all six specifications. With regards to the impact of fiscal policy on inequality, the findings display that government expenses have the desired

negative sign, i.e. higher government expenses lower inequality. Similarly, taxation is weaker, while it appears to have a redistributive impact. The role of fiscal deficit is very strong across all specifications. Finally, trade openness improves income distribution, while financial development has a detrimental effect on inequality.

Next, Table 1 (Panel 2: the probit equation) reports the estimates across several specifications when inequality is measured by the Gini index. Column (7) reports the results where the fiscal variable is government expenses, column (8) where the fiscal variable is tax revenues, column (9) where the fiscal variable is budget deficit/surplus, column (10) with budget deficit/surplus and where share prices are included, and column (11) with budget deficit/surplus and where the three regulatory dummies are introduced. Across all five specifications, income is proxied by real GDP. Column (12) shows the estimates with budget deficit/surplus, and income proxied by real GDP per capita. Finally, column (13) comes with budget deficit/surplus, real GDP per capita, share prices, and the three regulatory variables.

The findings document that across all specifications, higher inequality is associated with a higher probability of banking crises, with the results being stronger in the case where the fiscal variable is proxied by budget deficit/surplus, followed by government expenses. The impact of real GDP and real GDP per capita is negative, i.e. higher economic performance reduces the probability of a banking crisis. The drivers of consumer prices, real interest rate and money supply are statistically insignificant, while terms of trade and share prices exert a negative effect on the probability of a banking crisis. In terms of the depreciation rate, the estimates are negative. The driver of the credit to GDP ratio is positive. Finally, all three dummy regulations exert a positive and significant impact on the probability of a banking crisis to occur.

Table 1. Probit estimates with Gini index (inequality is affected by fiscal variables).

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Panel 1: Inequality equation						
inequality(-1)	0.874*** [0.00]	0.862*** [0.00]	0.881*** [0.00]	0.859*** [0.00]	0.866*** [0.00]	0.892*** [0.00]
GDP per capita	0.194*** [0.00]	0.148** [0.03]	0.249*** [0.00]	0.152** [0.03]	0.126** [0.05]	0.211*** [0.00]
government expenses	-0.096* [0.08]			-0.084* [0.09]		
tax revenues		0.077* [0.10]			0.042 [0.15]	
budget deficit			-0.148***			-0.131**

			[0.01]			[0.02]	
trade openness				-0.095*	-0.089*	-0.091*	
				[0.08]	[0.09]	[0.08]	
credit				0.065*	0.038	0.057*	
				[0.09]	[0.13]	[0.10]	

Variables	(7)	(8)	(9)	(10)	(11)	(12)	(13)
-----------	-----	-----	-----	------	------	------	------

Panel 2: Probit equation

Gini	0.395***	0.328***	0.468***	0.436***	0.442***	0.411***	0.392***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
GDP	-0.174***	-0.142***	-0.153***	-0.166***	-0.161***		
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]		
GDP per capita						-0.142***	-0.133***
						[0.00]	[0.00]
depreciation	-0.062***	-0.049**	-0.055**	-0.051**	-0.054**	-0.049**	-0.042**
	[0.00]	[0.03]	[0.02]	[0.03]	[0.03]	[0.03]	[0.04]
terms of trade	-0.084***	-0.081***	-0.076***	-0.070***	-0.076***	-0.074***	-0.066***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]

real interest rate	0.048*	0.042*	0.039*	0.035*	0.041*	0.037*	0.032
	[0.06]	[0.08]	[0.09]	[0.10]	[0.09]	[0.10]	[0.12]
prices	0.059*	0.048*	0.046*	0.041*	0.038	0.033	0.027
	[0.07]	[0.10]	[0.10]	[0.10]	[0.12]	[0.16]	[0.20]
M2	0.025	0.021	0.026	0.023	0.019	0.016	0.013
	[0.19]	[0.23]	[0.20]	[0.22]	[0.28]	[0.30]	[0.34]
credit	0.049*	0.044*	0.052*	0.057*	0.063**	0.058**	0.051*
	[0.07]	[0.08]	[0.06]	[0.06]	[0.05]	[0.05]	[0.06]
share prices				-0.064**			-0.062**
				[0.02]			[0.00]
credit regulation					0.045**		0.041**
					[0.03]		[0.04]
labor regulation					0.038**		0.034*
					[0.05]		[0.06]
business regulation					0.073***		0.068***
					[0.00]		[0.00]
<hr/>							
Pseudo R ²	0.37	0.34	0.44	0.58	0.55	0.52	0.59
No. of crises	81	81	81	81	81	81	81

No. of observations	987	987	987	987	987	987	987
---------------------	-----	-----	-----	-----	-----	-----	-----

Notes: Figures in brackets denote p-values. The number of zero lags was determined by the Akaike criterion. ***: $p \leq 0.01$, **: $p \leq 0.05$, *: $p \leq 0.10$.

IV. Conclusion

For the first time in the literature, the results of this paper exemplified the role of fiscal policy, through budget deficits and government expenses, as a catalytic factor for the probability of banking crises through the mechanism of inequality. The findings signify the role of fiscal variables as an effective tool through well-targeted programmes that champion greater access for the poor. It is critical policymakers to expand the social safety net, including means-tested income support to the poor, without of course missing the target of long-term debt sustainability.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

- Agnello, L., and Sousa, R. **2014**. “How Does Fiscal Consolidation Impact on Income Inequality?” *Review of Income and Wealth* 60(4): 702-726.
- Ball, L., Furceri, D., Leigh, D., and Loungani, P. **2013**. “The Distributional Effects of Fiscal Austerity.” IMF Working Paper, No. 13-151.
- Bazillier, R., and Hericourt, J. **2017**. “The Circular Relationship Between Inequality, Leverage, and Financial Crises.” *Journal of Economic Surveys*, 31(3): 463-496.
- Bellettini, G., Delbono, F., Karlstrom, P., and Pastorello, S. **2019**. “Income Inequality and Banking Crises: Testing the Level Hypothesis Directly.” *Journal of Macroeconomics* 62(1): 1-16.
- King, R.G., and Levine, R. **1993**. “Finance and Growth: Schumpeter Might Be Right.” *The Quarterly Journal of Economics* 108(5): 717-737.
- Kitao, S. **2010**. “Short-Run Fiscal Policy: Welfare, Redistribution and Aggregate Effects in the Short- and Long-Run.” *Journal of Economic Dynamics and Control* 34(16): 2109-2125.

- Kirschenmann, K., Malinen, T., and Nyberg, H. **2016**. “The Risk of Financial Crises: Is There a Role for Income Inequality?” *Journal of International Money and Finance* 68(2): 161-180.
- Laeven, L., and Valencia, F. **2013**. “Systemic Banking Crises Database.” *IMF Economic Review* 61(2): 225-270.
- Meltzer, A.H., and Richard, S.F. **1981**. “A Rational Theory of the Size of the Government.” *Journal of Political Economy* 89(6): 914-927.
- Persson, T., and Tabellini, G. **1994**. “Is Inequality Harmful to Growth? Theory and Evidence.” *American Economic Review* 84(4): 600-621.
- Perugini, C., Holscher, J., and Collie, S. **2016**. “Inequality, Credit and Financial Crises.” *Cambridge Journal of Economics* 40(2): 227-257.
- Pesaran, M. **2007**. “A Simple Panel Unit Root Test in the Presence of Cross-Section Dependence.” *Journal of Applied Econometrics* 22(2): 265-312.
- Rawdanowicz, Ł., Wurzel, E., and Christensen, K. **2013**. “The Equity Implications of Fiscal Consolidation.” Working Paper, No. 1013, OECD.
- Solt, F. **2009**. “Standardizing the World Income Inequality Database.” *Social Science Quarterly* 90(2): 231-242.
- Stiglitz, J. **2012**. *The Price of Inequality*. W.W. Norton & Company