The impact of macroprudential policies on industrial growth Appendix A: Description of the industrial activity across countries, checks to the exogeneity assumption of the Prudential Policy measures and further analysis of macroprudential policies' effects on industrial growth

Carlos Madeira

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Abstract

The online appendix A starts with a discussion of the methodology in the article with other studies in the macroeconomics literature.

The appendix shows a Figure with the distribution of the size and correlation with national GDP growth of the industry-country pairs.

Table A.1 shows the list of industries (with their corresponding external finance depence ratio) and countries included in the study. It also shows the share of manufacturing in terms of GDP by country, the share of the largest industry in terms of GDP, the size distribution in terms of GDP across industries-countries and the correlation between industries-countries with the national GDP.

Table A.2 shows that the past growth of industries does not predict the total prudential policy index or the regulatory loan to value.

Table A.3 considers just controls for the previous year's macroeconomic factors (inflation and GDP growth) and adds the current year's as well. This exercise shows that the results remain similar to the article even if we exclude the controls for the current monetary policy.

Table A.4 shows the estimated panel quantile regressions for industrial growth, using the quantiles 10 and 25 for low industrial growth.

Table A.5 shows a panel Arellano-Bond with fixed effects estimator, which shows that adding a lag for the endogenous industrial growth gives a small and insignificant coefficient.

Table A.6 shows estimations that account for each country group (AEs, EMs, LICs) across the different business cycle periods (low, middle and high national GDP growth).

Table A.7 shows the industrial growth exercise with interactions for the tightening and loosening prudential policy years. This exercise extends the one in Table 8 by including separate interactions of the tightening-loosening periods with both the macroprudential policies and the macroprudential policies interacted with the external finance dependence index.

Table A.8 shows the effects of macroprudential policies on industrial growth using half-decade periods (1990-1994, ..., 2015-2019) in order to measure the long term policy impact.

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Methodological comparison with previous studies

One methodology for estimating the macroeconomic effects of macroprudential policies is to use panel vector autoregressions (VARs), as in Kim and Mehrotra 2022. Using panel VARs for 32 economies, Kim and Mehrotra 2022 find that macroprudential policies have broad macroeconomic effects in a similar way as monetary policy, with an impact on real GDP, inflation, residential investment and credit growth. However, the identification of the panel VARs depends on specific assumptions about which variables have contemporaneous versus lagged effects and the structure of the transmission of the shocks to each outcome.

The identification assumption in this article instead is focused on the exogeneity assumption of the macroprudential policies relative to individual industries,[1] which allows for a more reduced-form estimation with simpler assumptions. Some studies use this assumption to identify the effect of macroprudential policies in micro-data of firms, but these studies often concentrate on relatively short periods of time such as a decade and are mostly limited to a specific country such as Spain (Jiménez et al. 2017) or Brazil (Becker et al. 2021). Using a survey of firms from the European Union countries, Ćehajić and Košak 2022 find that macroprudential policies strengthen the capitalization of the banking sector, but at the cost of reducing bank credit for firms, especially small enterprises. Some studies also consider the prudential policy effects on firms in a specific database such as Orbis (Ayyagari et al. 2018). However, the Orbis database is not representative of each country and industry, since it has very few firms from emerging markets, although it has a wide coverage for some European countries (Ayyagari et al. 2018). This article innovates by using a database such as UNIDO which covers equally a large number of countries and a broad number of industries for a long period of time.

Regression analysis of the exogeneity of financial policies relative to the industries' growth

Table A.2 shows the results of a regression that tests whether the industrial growth in the past can predict the macroprudential policies in the current year, estimating:

[1] This identification strategy is similar to the macroeconomic studies that assume that international shocks are exogenous to small open economies (Peersman 2004).

$MacroPru_{c,t} = \beta(\ln(GDP_{c,t}^{PPP,pc}), inflation_{c,t}, g_{c,t}^{GDP}, inflation_{c,t-1}, g_{c,t-1}^{GDP}) + \gamma MacroPru_{c,t-1} + \sum_i \beta_i g_{i,c,t-1} + \alpha_c + \alpha_t$.

The results show that there are few industries correlated with the current macroprudential policy decisions, either $TPI_{c,t}$ or $LTV_{c,t}$. The only positive industry coefficients are for the "Tobacco products", "Chemicals and chemical products" and "Non-metallic mineral products". Furthermore, these coefficients (although statistically significant) are very small, with values below 0.05 in absolute value. In the case of the regressions for Loan to Value, the coefficient for the lagged growth of the "Office, accounting and computing machinery" industry is significant, but it only has a -0.049 value. This regression is another confirmation that the analysis in this article is estimating an effect of prudential policies on industrial growth and not the other way around, because lagged industry growth either has no effect on prudential policies or it has a very small effect in the case of three industries ("Tobacco products", "Chemicals and chemical products", "Non-metallic mineral products").

Arellano-Bond and Blundell-Bond GMM robustness checks

The main article's estimator (reghdfe command by Correia 2017) does not consider lags of the endogenous variable of industrial growth, $g_{i,c,t}$, for two reasons. The first reason is that it makes it easier to interpret the effect of the macroprudential policies and its lags on the industrial growth, since the lag of the growth variable implies an endogenous dynamic that can accumulate for several periods. The second reason is that the combination of the lagged dependent variable with the fixed effects implies an inconsistency of the traditional least squares estimator. This problem would therefore require instrumental variables for the lagged dependent variables, under the form of older lags in levels (Blundell and Bond 1998) or first-differences (Arellano and Bond 1991). In the online appendix, I show a robustness check of the main model using the Arellano and Bond 1991 estimator. The results (in Table A.4 of the online appendix) show a small and insignificant autoregressive coefficient with a value of just -0.0131, which would support the main analysis discussed in this article. The Blundell and Bond 1998 estimator can be used for cases in which the autoregressive component of the dependent variables is too large. Since the estimated coefficient is so close to zero, then it would seem to be preferable to use the Arellano and Bond 1991 estimator. However, the interested readers can also see model estimates obtained with the Blundell

and Bond 1998 estimator in an older working paper version of this article (Madeira 2020). This working paper version estimates a similar model for the period 1990 to 2016, using the Blundell and Bond 1998 estimator to instrument for the endogenous lagged variable. The results in that exercise are broadly similar to the ones in the traditional least squares estimates and show a high statistical significance of macroprudential policies to affect the industrial growth of industries with a high external finance dependence.

Both the Arellano and Bond 1991 and the Blundell and Bond 1998 can be seen as solutions for the bias present in dynamic panel data models with a small number of periods, a problem known as Nickell's bias (Nickell 1981). Note, however, that the Blundell and Bond 1998 requires some assumptions for the initial conditions and could therefore be seen as applying in more specific cases than the Arellano and Bond 1991 estimator.

This online appendix shows the Arellano and Bond 1991 estimator for the period 1990-2021. A previous working paper draft of this article shows the estimates of the Blundell and Bond 1998 estimator for the period 1990-2016. See Madeira 2020.

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Figure 1: Distribution of the size in 2019 (as a % of GDP) of the different industries across countries and the correlation coefficients (in %) of the industries' growth with real GDP growth during the period 1990 to 2021

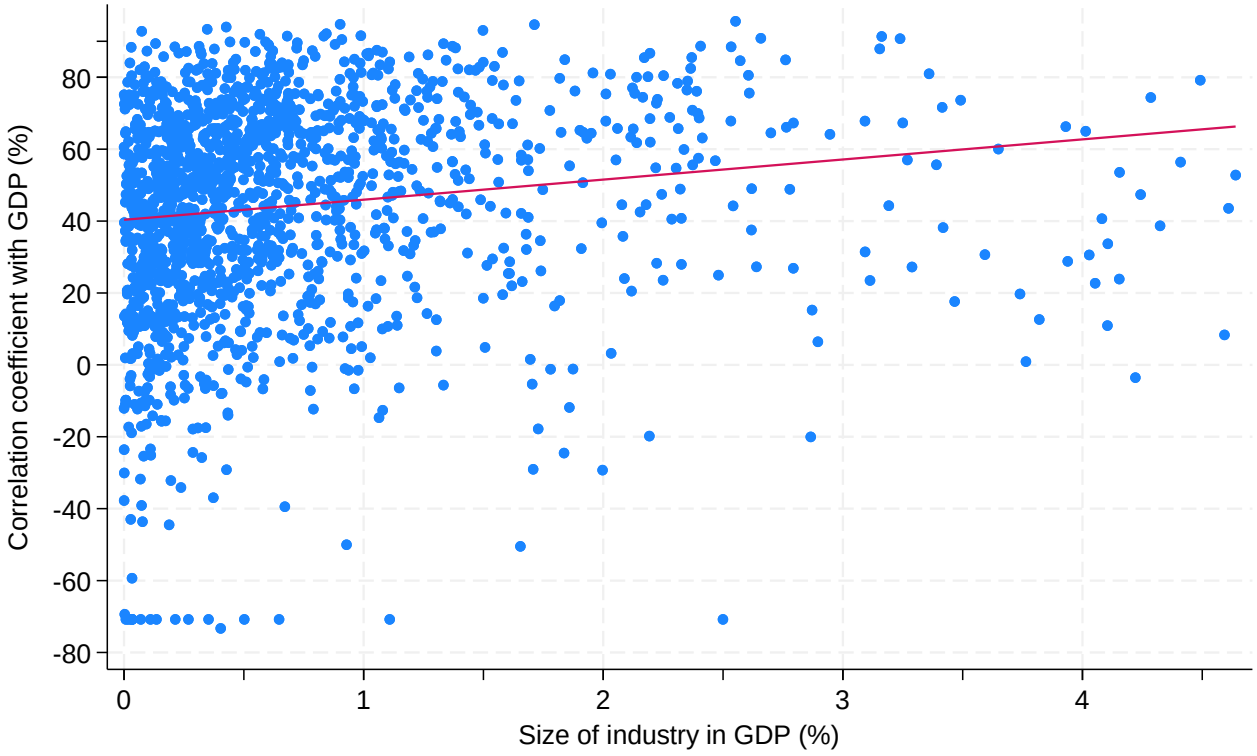

Table A.1: Industries and countries available in the joint industrial and macroprudential policy dataset

Industries (ISIC 2-digit revision 3) with External Finance Dependence (EFD_i) in parentheses:
15 Food and beverages (0.112), 16 Tobacco products (-0.451), 17 Textiles (0.277), 18 Wearing apparel, fur (0.029), 19 Leather, leather products and footwear (-0.113), 20 Wood products (excl. furniture) (0.283), 21 Paper and paper products (0.161), 22 Printing and publishing (0.203), 23 Coke, refined petroleum products, nuclear fuel (0.170), 24 Chemicals and chemical products (0.458), 25 Rubber and plastics products (0.634), 26 Non-metallic mineral products (0.193), 27 Basic metals (0.040), 28 Fabricated metal products (0.213), 29 Machinery and equipment n.e.c. (0.633), 30 Office, accounting and computing machinery (0.948), 31 Electrical machinery and apparatus (0.821), 32 Radio, television and communication equipment (0.975), 33 Scientific instruments, medical, precision and optical instruments (0.961), 34 Motor vehicles, trailers, semi-trailers (0.360), 35 Other transport equipment (0.328), 36 Furniture; manufacturing n.e.c. (0.235), 37 Other manufactured products and recycling (0.339).

Countries covered (89). Advanced economies (35): Australia, Austria, Belgium, Canada, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, South Korea, Latvia, Lithuania, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovakia, Slovenia, Spain, Sweden, Switzerland, Taiwan, UK, USA.
Emerging markets (29): Algeria, Argentina, Belarus, Bosnia, Brazil, Bulgaria, Chile, China, Colombia, Costa Rica, Croatia, Hungary, Kuwait, Lebanon, Malaysia, North Macedonia, Mauritius, Mexico, Oman, Peru, Poland, Romania, Russian Federation, Serbia, South Africa, Thailand, Trinidad and Tobago, Turkey, Uruguay.
Low-income countries (25): Albania, Armenia, Burundi, Ecuador, Fiji, Honduras, India, Indonesia, Jamaica, Jordan, Kyrgyzstan, Lao, Moldova, Mongolia, Morocco, Nepal, Pakistan, Paraguay, Philippines, Senegal, Sri Lanka, Tunisia, Vietnam, Ukraine, Zambia.

Distribution of the share of manufacturing value-added in GDP across countries in 2019 (in %):

$Share_{i,c,t}$	min	p10	p25	p50	p75	p90	max	min	p10	p25	p50	p75	p90	max
	Total manufacturing over GDP							Largest national industry over GDP						
All countries	1.2	6.3	9.7	12.7	17.6	21.4	31.5	0.4	1.4	2.0	2.8	3.5	4.9	14.6
AEs	1.2	5.8	9.6	12.4	18.7	22.6	31.5	0.4	1.2	1.8	2.1	3.2	5.1	14.6
EMs	3.7	7.2	10.9	12.8	17.9	21.6	26.8	1.2	1.9	2.2	2.8	3.5	4.5	7.0
LICs	5.9	7.1	8.6	12.6	14.9	18.8	26.1	1.0	1.9	2.7	3.1	4.1	4.9	9.9

Individual industries value-added as a share of GDP in 2019 and correlation of the individual industries' real growth with real GDP growth during 1990-2021 (in %):

$Share_{i,c,t}$	p10	p25	p50	p75	p90	p95	p99	min	p10	p25	p50	p75	p90	p95
	Individual manufactures over GDP							Correlation with GDP growth						
All countries	0.04	0.11	0.32	0.74	1.51	2.29	4.16	-73.3	6.4	27.7	48.4	66.1	77.8	83.5
AEs	0.04	0.14	0.37	0.80	1.55	2.06	3.90	-65.2	12.6	33.6	52.1	67.2	78.3	82.6
EMs	0.05	0.13	0.33	0.76	1.58	2.32	4.32	-69.4	12.8	32.2	54.7	69.4	80.2	84.5
LICs	0.03	0.08	0.23	0.57	1.25	2.44	4.27	-73.3	-12.3	11.9	31.6	52.3	69.1	82.0

Table A.2 (Part 1): Regressions of macroprudential policies on the lagged growth of the manufactures ($g_{c,i,t-1}$): Panel OLS-FE

Endogenous variable	$TPI_{c,t}$	$TPI_{c,t}$	$LTV_{c,t}$	$LTV_{c,t}$
Controls	(1)	(2)	(3)	(4)
$LTV_{c,t-1}$			0.863***	
			(0.0355)	
$CumulativeTPI_{c,t-1}$	-0.0641**			
	(0.0248)			
$inflation_{c,t-1}$	-0.000515	-0.00102	-0.00184	-0.0125
	(0.00122)	(0.00138)	(0.00394)	(0.0126)
$g^{GDP}_{c,t-1}$	0.00594	0.0191	-0.0516	-0.00717
	(0.0308)	(0.0308)	(0.0669)	(0.255)
$\ln(GDP^{PPP,pc}_{c,t-1})$	0.809	-0.564	-1.906	-24.93***
	(0.834)	(1.065)	(1.693)	(7.578)
$inflation_{c,t}$	0.00174	0.00354	-0.00308	0.0103
	(0.00275)	(0.00305)	(0.00846)	(0.0196)
$g^{GDP}_{c,t}$	0.0723***	0.0731***	-0.179***	-0.288*
	(0.0243)	(0.0240)	(0.0608)	(0.153)
Food and beverages	0.0227*	0.0230	-0.0841*	-0.116
	(0.0133)	(0.0140)	(0.0444)	(0.144)
Tobacco products	-0.0131**	-0.0132**	0.0235	-0.0500**
	(0.00575)	(0.00573)	(0.0210)	(0.0221)
Textiles	0.00802	0.00641	-0.0156	-0.0120
	(0.00695)	(0.00761)	(0.0198)	(0.0657)
Wearing apparel, fur	0.00468	0.00265	-0.00242	-0.0418
	(0.00495)	(0.00516)	(0.0109)	(0.0362)
Leather, leather	-0.00837	-0.00819	0.0170	0.0275
products and footwear	(0.00583)	(0.00550)	(0.0189)	(0.0354)
Wood products	0.00181	0.00218	-0.0220	-0.0616
(excl. furniture)	(0.00675)	(0.00680)	(0.0206)	(0.0433)
Paper and	-0.0115	-0.0113	0.0240	-0.0440
paper products	(0.00919)	(0.00957)	(0.0313)	(0.0703)

Table A.2 (Part 2): Regressions of macroprudential policies on the lagged growth of the manufactures ($g_{c,i,t-1}$): Panel OLS-FE

Endogenous variable	$TPI_{c,t}$	$TPI_{c,t}$	$LTV_{c,t}$	$LTV_{c,t}$
Controls	(1)	(2)	(3)	(4)
Printing and	0.00455	0.00224	-0.000800	0.0173
publishing	(0.00731)	(0.00748)	(0.0226)	(0.0447)
Coke, refined	-0.00406	-0.00368	0.0122	0.0294*
petroleum products,	(0.00295)	(0.00289)	(0.00806)	(0.0155)
nuclear fuel				
Chemicals and	0.0141***	0.0140***	-0.0206**	-0.00335
chemical products	(0.00448)	(0.00448)	(0.00951)	(0.0136)
Rubber and	-0.00102	-1.71e-05	0.0505**	0.0237
plastics products	(0.00863)	(0.00935)	(0.0233)	(0.0552)
Non-metallic	0.0150	0.0171*	-0.0490**	0.0642
mineral products	(0.00898)	(0.00863)	(0.0234)	(0.0442)
Basic metals	0.00328	0.00136	0.0218	0.0152
	(0.00921)	(0.00933)	(0.0233)	(0.0290)
Fabricated	0.00606	0.00318	0.0405	0.0282
metal products	(0.00914)	(0.00887)	(0.0282)	(0.0478)
Machinery and	-0.00203	0.000876	-0.0332*	0.0400
equipment n.e.c.	(0.00953)	(0.00950)	(0.0177)	(0.0334)
Office, accounting and	-0.00195	-0.00163	0.0179***	0.0657***
computing machinery	(0.00355)	(0.00321)	(0.00582)	(0.0175)
Electrical machinery	0.00212	-0.000773	-0.0185	-0.0299
and apparatus	(0.00646)	(0.00618)	(0.0183)	(0.0364)
Radio, television	-0.00294	-0.00380	0.0134	0.0149
and communication	(0.00657)	(0.00587)	(0.0189)	(0.0758)
equipment				
Medical, precision	-0.0103	-0.00723	-0.00400	-0.0462
and optical instruments	(0.00618)	(0.00558)	(0.0144)	(0.0658)
Motor vehicles,	0.00310	0.00340	-0.0138*	0.00501
trailers, semi-trailers	(0.00388)	(0.00384)	(0.00754)	(0.0141)
Other transport	-0.00145	-0.00216	0.0258**	0.0138
equipment	(0.00453)	(0.00447)	(0.0117)	(0.0215)
Furniture;	-0.00789	-0.00751	0.000474	-0.0472
manufacturing n.e.c.	(0.00917)	(0.00861)	(0.0175)	(0.0587)
Observations	793	793	674	675
R^2 (overall)	0.450	0.434	0.946	0.799
R^2 (overall) without the	0.319	0.311	0.943	0.696
industries' growth lags				

Robust standard-errors in (). ***,**,* denote 1%, 5%, 10% statistical significance. Clusters by country.
All regressions include fixed-effects by country and year (omitted).

Table A.3: Effects on industries' growth of the countries' macroprudential policies: Panel OLS-FE

Controls	(1)	(2)	(3)	(4)	(5)
$TPI_{c,t}$	0.324***	0.324***	0.176***	0.153**	0.170***
	(0.0586)	(0.0585)	(0.0570)	(0.0664)	(0.0583)
$TPI_{c,t-1}$					0.0158
					(0.0569)
$CumulativeTPI_{c,t-1}$	0.0293		0.00800		
	(0.0220)		(0.0219)		
$TPI_{c,t} \times EFD_i$	-0.210**	-0.210**	-0.219**	-0.305**	-0.175
	(0.107)	(0.107)	(0.112)	(0.144)	(0.125)
$TPP_{c,t-1} \times EFD_i$					-0.218*
					(0.121)
$CumulativeTPI_{c,t-1}$	-0.0181		-0.0165		
$\times EFD_i$	(0.0360)		(0.0359)		
$ShareManVA_{i,c,t-1}$	-0.204***	-0.200***	-0.198***	-0.196***	-0.197***
	(0.0407)	(0.0400)	(0.0407)	(0.0400)	(0.0408)
$\ln(GDP^{PPP,pc}_{c,t-1})$	-7.851***	-7.251***	-3.130***	-2.706***	-3.131***
	(0.746)	(0.680)	(0.747)	(0.687)	(0.700)
Other controls:					
$g^{GDP}_{c,t-1}, inflation_{c,t-1}$	Yes	Yes	Yes	Yes	Yes
$g^{GDP}_{c,t}, inflation_{c,t}$	No	No	Yes	Yes	Yes
N	39,113	39,594	39,113	39,594	39,113
R^2 (overall)	0.170	0.168	0.212	0.212	0.212

Robust standard errors in (). ***,**,* denote 1%, 5%, 10% statistical significance.
Clusters by industry-country.
All regressions include fixed effects by industry-country and year (omitted).

Table A.4: Effects on industries' growth of the macroprudential policies, according to the low quantiles of industry-country growth: Panel QR-FE

Quantiles:	Q10	Q25	Q10	Q25
Controls	(1)	(2)	(3)	(4)
$TPI_{c,t}$	0.0767	0.100		
	(0.152)	(0.102)		
$TPI_{c,t-1}$	0.0497	0.0446		
	(0.149)	(0.0999)		
$LTV_{c,t}$			-0.0164	-0.0211
			(0.0354)	(0.0236)
$TPI_{c,t} \times EFD_i$	-0.0780	-0.185		
	(0.346)	(0.233)		
$TPI_{c,t-1} \times EFD_i$	-0.212	-0.253		
	(0.344)	(0.231)		
$LTV_{c,t} \times EFD_i$				
$ShareManVA_{i,c,t-1}$	-0.111	-0.179***	-0.0747	-0.153***
	(0.0918)	(0.0617)	(0.0858)	(0.0570)
$\ln(GDP^{PPP,pc}_{c,t-1})$	2.824*	-1.224	2.415	-1.403
	(1.675)	(1.127)	(1.618)	(1.076)
		Other controls:		
$g^{GDP}_{c,t-1}, inflation_{c,t-1}$	Yes	Yes	Yes	Yes
$g^{GDP}_{c,t}, inflation_{c,t}$	Yes	Yes	Yes	Yes
$MPR_{c,t}, ZLB_{c,t}$	Yes	Yes	Yes	Yes
N	31,316	31,316	27,624	27,624

Robust standard errors in (). ***,**,* denote 1%, 5%, 10% statistical significance.
Clusters by industry-country.
All regressions include fixed effects by industry-country (omitted).
All regressions include dummies for the periods 1991-2006 (Great Moderation), 2007-2009 (Great Financial Crisis), 2010-2014 (European Sovereign Debt Crisis), and 2020-2021 (Covid Pandemic).

Table A.5: Effect on industries' growth of the macroprudential policies, with a one year lag of the industries' growth:
Panel Arellano-Bond with FE

$MacroPru_{c,t}$ =	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$LTV_{c,t}$
Controls	(1)	(2)	(3)	(4)	(5)
$MacroPru_{c,t}$	0.142**	0.155***	0.135**	0.136**	0.00851
	(0.0599)	(0.0571)	(0.0581)	(0.0619)	(0.0125)
$MacroPru_{c,t-1}$			0.0897	0.0861	
			(0.0607)	(0.0598)	
$MacroPru_{c,t-2}$				0.00409	
				(0.0819)	
$MacroPru_{c,t} \times EFD_i$	-0.158*	-0.247*	-0.164*	-0.246*	0.0772***
	(0.095)	(0.149)	(0.099)	(0.149)	(0.0176)
$MacroPru_{c,t-1} \times EFD_i$			-0.0874**	-0.159*	
			(0.036)	(0.096)	
$MacroPru_{c,t-2} \times EFD_i$				-0.197**	
				(0.094)	
$CumulativeTPI_{c,t-1}$	0.0220				
	(0.0299)				
$CumulativeTPI_{c,t-1}$	0.0747				
$\times EFD_i$	(0.0580)				
$ShareManVA_{i,c,t-1}$	-0.927***	-0.933***	-0.935***	-0.951***	-1.033***
	(0.157)	(0.158)	(0.158)	(0.162)	(0.165)
$\ln(GDP_{c,t-1}^{PPP,pc})$	-3.719***	-3.070***	-2.998***	-2.632***	-3.377***
	(1.177)	(0.989)	(0.982)	(1.008)	(1.017)
$g_{c,i,t-1}$ (one year lag of	-0.0131	-0.0130	-0.0137	-0.0142	0.0407*
manufacture i growth)	(0.0244)	(0.0244)	(0.0243)	(0.0243)	(0.0241)
Other controls: all the regressions include controls for $g_{c,t-1}^{GDP}, inflation_{c,t-1}$, $g_{c,t}^{GDP}, inflation_{c,t}, MPR_{c,t}, ZLB_{c,t}$					
N	29,371	29,371	29,371	29,119	25,808

Robust standard-errors in (). ***,**,* denote 1%, 5%, 10% statistical significance.
Moments are obtained using one and two year lags.
All regressions include fixed-effects by industry-country and year (omitted).

Table A.6: Effects on industries' growth of the countries' macroprudential policies: Panel OLS-FE

	Advanced economies		Emerging markets		Low-income countries	
Controls	(1)	(2)	(3)	(4)	(5)	(6)
$TPI_{c,t} \times Low$	0.198*	0.198*	0.445***	0.392***	0.768***	0.798*
$growth_{c,t}$	(0.114)	(0.117)	(0.123)	(0.122)	(0.290)	(0.423)
$TPI_{c,t} \times Middle$	0.120	0.155*	-0.0357	-0.129	-0.0101	0.133
$growth_{c,t}$	(0.0918)	(0.0933)	(0.112)	(0.109)	(0.255)	(0.321)
$TPI_{c,t} \times High$	-0.441	-0.448	-0.0373	-0.218*	0.379	0.799**
$growth_{c,t}$	(0.312)	(0.328)	(0.114)	(0.113)	(0.280)	(0.342)
$TPI_{c,t} \times EFD_i \times$	-0.420**	-0.431**	-0.668***	-0.676***	0.307	-0.0413
$Low\ growth_{c,t}$	(0.213)	(0.214)	(0.254)	(0.250)	(0.674)	(0.774)
$TPI_{c,t} \times EFD_i \times$	-0.761***	-0.819***	-0.0552	-0.331	1.128*	0.968
$Middle\ growth_{c,t}$	(0.214)	(0.216)	(0.303)	(0.280)	(0.638)	(0.750)
$TPI_{c,t} \times EFD_i \times$	-0.323	-0.486	0.169	0.180	1.236*	1.709***
$High\ growth_{c,t}$	(0.650)	(0.707)	(0.262)	(0.264)	(0.704)	(0.593)
$ShareManVA_{i,c,t-1}$	-0.154***	-0.174***	-0.244***	-0.268**	-0.155*	-0.359**
	(0.0466)	(0.0538)	(0.0698)	(0.104)	(0.0929)	(0.149)
$\ln(GDP^{PPP,pc}_{c,t-1})$	-3.000***	-4.770***	-3.931***	-5.626***	0.127	-0.257
	(1.145)	(1.460)	(1.189)	(1.125)	(1.927)	(3.606)
	Other controls:					
$g^{GDP}_{c,t-1}, inflation_{c,t-1}$	Yes	Yes	Yes	Yes	Yes	Yes
$g^{GDP}_{c,t}, inflation_{c,t}$	Yes	Yes	Yes	Yes	Yes	Yes
$MPR_{c,t}, ZLB_{c,t}$	No	Yes	No	Yes	No	Yes
N	19,522	17,511	12,887	9,734	7,185	4,281
R^2 (overall)	0.283	0.291	0.231	0.298	0.135	0.161

Robust standard errors in (). ***,**,* denote 1%, 5%, 10% statistical significance.
Clusters by industry-country.
All regressions include fixed effects by industry-country and year (omitted).

Table A.7: Growth effects during tightening or loosening years: Panel OLS-FE

$MacroPru_{c,t} =$	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$LTV_{c,t}$
Controls	(1)	(2)	(3)	(4)	(5)
Controls interacted with $Constant = 1$					
$MacroPru_{c,t-1}$			-0.0802	-0.0585	-0.0163
			(0.106)	(0.116)	(0.0200)
$MacroPru_{c,t-2}$				-0.138	
				(0.184)	
$CumulativeTPI_{c,t-1}$	-0.0121				
	(0.0299)				
$MacroPru_{c,t-1} \times EFD_i$			-0.456**	-0.353*	0.106**
			(0.233)	(0.214)	(0.0478)
$MacroPru_{c,t-2} \times EFD_i$				-0.657*	
				(0.353)	
$CumulativeTPI_{c,t-1}$	-0.114**				
$\times EFD_i$	(0.0574)				
Controls interacted with $Tighten_{c,t} = 1(TPI_{c,t} > 0) = 1$					
$MacroPru_{c,t}$	0.0912	0.0888	0.0648	0.0258	-0.0274*
	(0.0871)	(0.0835)	(0.0908)	(0.0895)	(0.0155)
$MacroPru_{c,t-1}$			0.113	0.0735	
			(0.138)	(0.147)	
$MacroPru_{c,t-2}$				0.312	
				(0.204)	
$CumulativeTPI_{c,t-1}$	0.0191				
	(0.0255)				
$MacroPru_{c,t} \times EFD_i$	-0.402**	-0.365**	-0.306*	-0.277	-0.00277
	(0.178)	(0.159)	(0.173)	(0.175)	(0.00711)
$MacroPru_{c,t-1} \times EFD_i$			0.243	0.164	
			(0.304)	(0.326)	
$MacroPru_{c,t-2} \times EFD_i$				0.177	
				(0.435)	
$CumulativeTPI_{c,t-1}$	0.0915*				
$\times EFD_i$	(0.0547)				
Controls interacted with $Loosen_{c,t} = 1(TPI_{c,t} < 0) = 1$					
$MacroPru_{c,t}$	0.563***	0.391**	0.412**	0.495***	-0.0135
	(0.174)	(0.157)	(0.161)	(0.174)	(0.0198)
$MacroPru_{c,t-1}$			0.158	0.0930	
			(0.174)	(0.179)	
$MacroPru_{c,t-2}$				0.313	
				(0.210)	
$CumulativeTPI_{c,t-1}$	0.0866**				
	(0.0383)				
$MacroPru_{c,t} \times EFD_i$	-0.370	-0.269	-0.332	-0.524	0.0113
	(0.336)	(0.270)	(0.283)	(0.345)	(0.0112)
$MacroPru_{c,t-1} \times EFD_i$			0.127	0.154	
			(0.452)	(0.470)	
$MacroPru_{c,t-2} \times EFD_i$				-0.104	
				(0.505)	
$CumulativeTPI_{c,t-1}$	0.0693				
$\times EFD_i$	(0.0805)				
N	31,313	31,526	31,313	30,979	27,623
R^2 (overall)	0.248	0.247	0.247	0.247	0.288

Robust standard errors in (). ***,**,* denote 1%, 5%, 10% statistical significance. Clusters by industry-country. All regressions include controls for $ShareManVA_{i,c,t-1}$, $\ln(GDP^{PPP,pc}_{c,t-1})$, $g^{GDP}_{c,t-1}$, $inflation_{c,t-1}$, $g^{GDP}_{c,t}$, $inflation_{c,t}$, $MPR_{c,t}$, $ZLB_{c,t}$, $Tighten_{c,t}$, $Loosen_{c,t}$, fixed effects by industry-country and year (omitted).

Table A.8: Effects on industries' growth of the macroprudential policies with half-decade periods across country groups (All countries, AEs, EMs, LICs): Panel OLS-FE

	All countries	All countries	Advanced economies	Emerging markets	Low-income countries
Controls	(1)	(2)	(3)	(4)	(5)
$TPI_{c,t}$	0.242*		0.339*	0.0646	0.0396
	(0.126)		(0.201)	(0.178)	(0.654)
$TPI_{c,t-1}$	0.291		0.495	-0.171	0.236
	(0.196)		(0.328)	(0.228)	(1.036)
$LTV_{c,t}$		-0.0337			
		(0.0262)			
$LTV_{c,t-1}$		0.0322			
		(0.0268)			
$TPI_{c,t} \times EFD_i$	-0.775***		-0.791**	-0.734*	-0.739
	(0.250)		(0.319)	(0.434)	(1.129)
$TPI_{c,t-1} \times EFD_i$	-0.598		-0.658	0.0601	-3.793***
	(0.398)		(0.798)	(0.402)	(1.373)
$LTV_{c,t} \times EFD_i$		0.172**			
		(0.0764)			
$LTV_{c,t-1} \times EFD_i$		-0.0648			
		(0.0590)			
$ShareManVA_{i,c,t-1}$	-0.141**	-0.161***	-0.0801	-0.217*	-0.202
	(0.0547)	(0.0604)	(0.0650)	(0.115)	(0.140)
$\ln(GDP^{PPP,pc}_{c,t-1})$	-0.328	-1.117	-1.854	-2.148	11.01**
	(1.151)	(1.174)	(1.772)	(1.607)	(5.351)
			Other controls:		
$g^{GDP}_{c,t-1}, inflation_{c,t-1}$	Yes	Yes	Yes	Yes	Yes
$g^{GDP}_{c,t}, inflation_{c,t}$	Yes	Yes	Yes	Yes	Yes
$MPR_{c,t}, ZLB_{c,t}$	Yes	Yes	Yes	Yes	Yes
N	5,899	5,093	3,268	1,823	808
R^2 (overall)	0.465	0.486	0.481	0.462	0.432

Robust standard errors in (). ***,**,* denote 1%, 5%, 10% statistical significance.
Clusters by industry-country.
All regressions include fixed effects by industry-country and half-decade (omitted).

The impact of macroprudential policies on industrial growth Appendix B: Robustness analysis using different measures of external finance dependence

Carlos Madeira

February 2024

Abstract

The online appendix B shows the results of using alternative measures of external finance dependence. The article uses the measure of Rajan and Zingales 1998 for the period 1980-1989, because it starts before the period of the macroprudential policies and is exogenous to events happening during 1990 to 2021. It is also the classic variable that is used across most studies (Claessens and Laeven 2003, Braun and Larrain 2005, Cowan and Raddatz 2013, among others).

Table B.1 details the different measures of external finance dependence and their sources. Note that the Worldscope data used by Villani 2021 has fewer US companies than the Compustat dataset used by Rajan and Zingales 1998, Kroszner et al. 2007, Lo Turco et al. 2019. Therefore, the measure of Villani 2021 has a higher standard error and could be more noisy.

Table B.2 shows that all the measures have a high correlation with the standard Rajan and Zingales 1998 variable used in the main article.

Table B.3 shows that the article's results are robust to using: i) indicator variables (-1,0,+1) of the external finance dependence; ii) the external finance dependence measure of Villani 2021 for the period 2010-2015; iii) the Kaplan-Zingales financial constraints measure for the period 2010-2017 (Hadlock and Pierce 2010).

Table B.4 shows that the results are robust to using the external finance dependence measures for the period 1980-1999 (Kroszner et al. 2007) and for the period 1990-2007 (Lo Turco et al. 2019).

Ethical Statement/Conflict of Interest: The author has no conflicts of interest.

Table B.1: Additional variables used in the appendix and their sources

Variable	Description	Source
EFD_i	External Finance Dependence index of manufacture i: the fraction of capital expenditures of the median firm that is not financed with cash-flow: (capital expenditures-cash-flow)/capital expenditures. Calculation for the US firms in Compustat between 1980 and 1989.	Rajan & Zingales (1998)
$I(EFD_i)$	Indicator variable for the External Finance index of manufacture i, with the lowest 30% of EFD_i values being -1, the highest 30% being 1, and the other industries having a value of 0.	Rajan & Zingales (1998)
$EFD_i^{1980-1999}$	External Finance Dependence index of manufacture i: computed from US firms in Compustat for the period 1980-1999	Kroszner et al. (2007)
$I(EFD_i^{1980-1999})$	Indicator variable for the EFD index of 1980-1999, with the lowest 30% of EFD_i values being -1, the highest 30% being 1, and the other industries having a value of 0.	Kroszner et al. (2007)
$EFD_i^{1990-2007}$	External Finance Dependence index of manufacture i: computed from US firms in Compustat for the period 1990-2007	Lo Turco et al. (2019)
$I(EFD_i^{1990-2007})$	Indicator variable for the EFD index of 1990-2007, with the lowest 30% of EFD_i values being -1, the highest 30% being 1, and the other industries having a value of 0.	Lo Turco et al. (2019)
$EFDV_i^{1980-89}$	External Finance Dependence index of manufacture i: computed from US firms in Worldscope by Villani for the period 1980-1989	Villani (2021)
$EFDV_i^{2010-15}$	External Finance Dependence index of manufacture i: computed from US firms in Worldscope by Villani for the period 2010-2015	Villani (2021)
$I(EFDV_i^{2010-15})$	Indicator variable for the External Finance Dependence index of manufacture i from the US firms in Worldscope for 2010 to 2015: -1 for the lowest 30% $EFD_i^{2010-15}$, 1 for the 30% highest, 0 others.	Villani (2021)
$KZ_i^{2010-17}$	Kaplan-Zingales index of financial constraints, based on ordered logit estimates of US firms in Compustat for 2010 to 2017. Index loads positively on leverage and Tobin-Q (firm market value over book assets), and negatively on cash flow, cash level and dividends	Hadlock & Pierce (2010)

Table B.2: Correlation of the Rajan-Zingales index (1998) with other measures of external finance dependence

Measures	Correlation Coefficient with EFD_i (in %)	Source
$EFD_i^{1980-1999}$	85.3	Kroszner et al. 2007
$EFD_i^{1990-2007}$	73.9	Lo Turco et al. 2019
$EFDV_i^{1980-89}$	36.8	Villani 2021
$EFDV_i^{2010-15}$	50.1	Villani 2021
$KZ_i^{2010-17}$	33.5	Hadlock & Pierce 2010
$I(EFD_i)$	87.8	Rajan & Zingales 1998
$I(EFD_i^{1980-1999})$	67.6	Kroszner et al. 2007
$I(EFD_i^{1990-2007})$	56.4	Lo Turco et al. 2019
$I(EFDV_i^{2010-15})$	49.9	Villani 2021

Note also that the External Finance Dependence average measures from Villani 2021 for the period 1980-1999 only has a correlation of 50.2% with the measure $EFD_i^{1980-1999}$ (Kroszner et al. 2007). The External Finance Dependence average measure from Villani 2021 for the period 1990-2009 only has a correlation of 50.6% with the measure $EFD_i^{1990-2007}$ (Lo Turco et al. 2019).

Table B.3: Robustness checks. The effects on industries' growth with alternative measures of macroprudential policies ($MacroPru_{c,t}$) or of industry external finance dependence (Z_i): Panel OLS-FE

$MacroPru_{c,t} =$	$LTV_{c,t}$	$LTV_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$
$Z_i =$	EFD_i	EFD_i	$I(EFD_i)$	$I(EFDV_i^{2010-15})$	$KZ_i^{2010-17}$
Controls	(1)	(2)	(3)	(4)	(5)
$MacroPru_{c,t}$	-0.0396**	-0.0352**	0.0378	0.0603	-0.0457
	(0.0173)	(0.0170)	(0.0476)	(0.0477)	(0.0695)
$MacroPru_{c,t} \times EFD_i$	0.0803**	0.109**	-0.111**	-0.134***	-0.0243*
	(0.0410)	(0.0477)	(0.0451)	(0.0430)	(0.0140)
$ShareManVA_{i,c,t-1}$	-0.213***	-0.226***	-0.248***	-0.249***	-0.276***
	(0.0559)	(0.0533)	(0.0503)	(0.0502)	(0.0592)
$\ln(GDP_{c,t-1}^{PPP,pc})$	-8.708***	-4.710***	-3.952***	-3.956***	-3.920***
	(0.769)	(0.844)	(0.838)	(0.838)	(0.944)
Other controls:					
$g_{c,t-1}^{GDP}, inflation_{c,t-1}$	Yes	Yes	Yes	Yes	Yes
$g_{c,t}^{GDP}, inflation_{c,t}$	No	Yes	Yes	Yes	Yes
$MPR_{c,t}, ZLB_{c,t}$	No	Yes	Yes	Yes	Yes
N	31,523	27,623	31,526	31,526	25,910
R^2 (overall)	0.197	0.288	0.247	0.247	0.242

Robust standard-errors in (). ***,**,* denote 1%, 5%, 10% statistical significance.
Clusters by industry-country.
All regressions include fixed-effects by industry-country and year (omitted).

Table B.4: Effect on industries' growth of the macroprudential policies interacted with the external finance dependence for 1990-2007 (Lo Turco et al. 2019) and the external finance dependence for 1980-1999 (Kroszner et al. 2007): Panel OLS-FE

$Z_i =$	$EFD_i^{1980-99}$	$I(EFD_i^{1980-99})$	$EFD_i^{1990-2007}$	$I(EFD_i^{1990-2007})$	$EFD_i^{1980-99}$	$EFD_i^{1990-2007}$
$MacroPru_{c,t} =$	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$LTV_{c,t}$	$LTV_{c,t}$
Controls	(1)	(2)	(3)	(4)	(5)	(6)
$MacroPru_{c,t}$	0.0376	0.0490	0.0673	0.0509	0.00474	0.00684
	(0.0498)	(0.0490)	(0.0506)	(0.0499)	(0.0127)	(0.0127)
$MacroPru_{c,t-1}$	-0.0886	-0.0837	-0.0405	-0.0817		
	(0.0550)	(0.0535)	(0.0518)	(0.0539)		
$MacroPru_{c,t-2}$	-0.0318	-0.0239	-0.0542	-0.0425		
	(0.0622)	(0.0613)	(0.0631)	(0.0639)		
$MacroPru_{c,t}$	-0.255**	-0.128**	-0.106**	-0.0388**	0.0768**	0.0607*
$\times Z_i$	(0.111)	(0.0535)	(0.0532)	(0.0152)	(0.0387)	(0.0338)
$MacroPru_{c,t-1}$	-0.0597	0.00661	-0.0920*	-0.135*		
$\times Z_i$	(0.114)	(0.0548)	(0.0546)	(0.0793)		
$MacroPru_{c,t-2}$	-0.227*	-0.0828	-0.287*	-0.157**		
$\times Z_i$	(0.137)	(0.0693)	(0.164)	(0.0800)		
$ShareManVA_{i,c,t-1}$	-0.249***	-0.250***	-0.255***	-0.256***	-0.233***	-0.242***
	(0.0518)	(0.0518)	(0.0521)	(0.0521)	(0.0540)	(0.0553)
$\ln(GDP_{c,t-1}^{PPP,pc})$	-3.935***	-3.929***	-3.920***	-3.914***	-4.700***	-4.681***
	(0.856)	(0.856)	(0.855)	(0.855)	(0.845)	(0.841)
Other controls: All regressions control for $g_{c,t-1}^{GDP}, inflation_{c,t-1}$, $g_{c,t}^{GDP}, inflation_{c,t}, MPR_{c,t}, ZLB_{c,t}$.						
N	30,979	30,979	30,979	30,979	27,623	27,623
R^2 (overall)	0.246	0.246	0.246	0.246	0.288	0.288

Robust standard-errors in (). ***,**,* denote 1%, 5%, 10% statistical significance.
Clusters by industry-country.
All regressions include fixed-effects by industry-country and year (omitted).

The impact of macroprudential policies on industrial growth

Appendix C: Effects across different periods

Carlos Madeira

February 2024

Abstract

The online appendix C shows the results of exercises with interactions for different periods.

Table C.1 shows the results with an interaction for the Covid pandemic period (2020-2021).

Table C.2 shows the results with a full set of interactions for different periods: Great Moderation (1991-2006), Great Financial Crisis (2007-2009), European Sovereign Debt Crisis (2010-2014), and Covid Pandemic (2020-2021).

The results in Table C.2 show that the coefficients with no interaction (that is, with a constant being interacted with the variables) are roughly similar to the standard model in Table 2 of the article. The Great Financial Crisis shows a positive growth effect for net tightening measures implemented one year before. The Covid-19 Pandemic interaction terms show that externally dependent industries experienced a positive growth effect for tightening measures implemented in the current year, one and two years before. The coefficient for the policies implemented two years before is quite large and statistically significant. These results can be interpreted as a positive effect of prudential policies implemented before the crises.

Ethical Statement/Conflict of Interest: The author has no conflicts of interest to declare that are relevant to the content of this article.

Table C.1: Effect on industries' growth of the macroprudential policies interacted with the Covid pandemic period (2020-2021): Panel OLS-FE

$MacroPru_{c,t} =$	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$LTV_{c,t}$
Controls	(1)	(2)	(3)	(4)	(5)
Controls interacted with $Constant = 1$					
$MacroPru_{c,t}$	0.0847	0.121*	0.0840	0.0824	-0.0380**
	(0.0691)	(0.0671)	(0.0696)	(0.0700)	(0.0166)
$MacroPru_{c,t-1}$			0.0878	0.0798	
			(0.0696)	(0.0715)	
$MacroPru_{c,t-2}$				0.0473	
				(0.0792)	
$MacroPru_{c,t} \times EFD_i$	-0.302**	-0.426***	-0.288**	-0.237*	0.125***
	(0.151)	(0.139)	(0.139)	(0.142)	(0.0477)
$MacroPru_{c,t-1} \times EFD_i$			-0.465***	-0.363**	
			(0.159)	(0.163)	
$MacroPru_{c,t-2} \times EFD_i$				-0.409**	
				(0.176)	
$CumulativeTPI_{c,t-1}$	0.0273				
	(0.0253)				
$CumulativeTPI_{c,t-1}$	-0.105**				
$\times EFD_i$	(0.0444)				
Controls interacted with Covid-19 Pandemic$_t = 1$					
$MacroPru_{c,t}$	0.152	0.139	0.127	0.136	-0.0303
	(0.153)	(0.154)	(0.158)	(0.161)	(0.0186)
$MacroPru_{c,t-1}$			-0.389***	-0.409***	
			(0.148)	(0.149)	
$MacroPru_{c,t-2}$				0.270	
				(0.202)	
$MacroPru_{c,t} \times EFD_i$	0.446	0.461	0.493	0.519	0.0444***
	(0.310)	(0.311)	(0.326)	(0.340)	(0.0100)
$MacroPru_{c,t-1} \times EFD_i$			0.857**	0.759**	
			(0.338)	(0.331)	
$MacroPru_{c,t-2} \times EFD_i$				0.552*	
				(0.334)	
$CumulativeTPI_{c,t-1}$	-0.0232				
	(0.0234)				
$CumulativeTPI_{c,t-1}$	0.156***				
$\times EFD_i$	(0.0461)				
Controls without interactions					
$ShareManVA_{i,c,t-1}$	-0.239***	-0.243***	-0.237***	-0.245***	-0.233***
	(0.0502)	(0.0501)	(0.0504)	(0.0514)	(0.0536)
$\ln(GDP^{PPP,pc}_{c,t-1})$	-4.219***	-4.103***	-4.195***	-4.020***	-4.774***
	(0.903)	(0.843)	(0.849)	(0.860)	(0.849)
Other controls: all the regressions include controls for $g^{GDP}_{c,t-1}, inflation_{c,t-1}$, $g^{GDP}_{c,t}, inflation_{c,t}, MPR_{c,t}, ZLB_{c,t}$					
N	31,313	31,526	31,313	30,979	27,623
R^2 (overall)	0.247	0.247	0.248	0.247	0.289

Robust standard-errors in (). ***,**,* denote 1%, 5%, 10% statistical significance.
Clusters by industry-country.
All regressions include fixed-effects by industry-country and year (omitted).

Table C.2 (Part 1): Effects on industries' growth of macroprudential policies, with interactions for different periods: Great Moderation (1991-2006), Great Financial Crisis (2007-2009), European Sovereign Debt Crisis (2010-2014), and Covid-19 Pandemic (2020-2021) - Panel OLS-FE

$MacroPru_{c,t}$ =	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$LTV_{c,t}$
Controls	(1)	(2)	(3)	(4)	(5)
Controls interacted with $Constant = 1$					
$MacroPru_{c,t}$	0.00773	0.0717	0.0368	0.0103	-0.0450**
	(0.107)	(0.105)	(0.106)	(0.108)	(0.0192)
$MacroPru_{c,t-1}$			0.00670	-0.0124	
			(0.0601)	(0.0622)	
$MacroPru_{c,t-2}$				0.113	
				(0.0789)	
$CumulativeTPI_{c,t-1}$	0.0350				
	(0.0246)				
$MacroPru_{c,t} \times EFD_i$	-0.432**	-0.455***	-0.222	-0.465*	0.0899*
	(0.220)	(0.174)	(0.205)	(0.248)	(0.0536)
$MacroPru_{c,t-1} \times EFD_i$			-0.412*	-0.310	
			(0.214)	(0.233)	
$MacroPru_{c,t-2} \times EFD_i$				-0.393	
				(0.258)	
$CumulativeTPI_{c,t-1}$	-0.102**				
$\times EFD_i$	(0.0454)				

Table C.2 (Part 2): Effects on industries' growth of macroprudential policies, with interactions for different periods: Great Moderation (1991-2006), Great Financial Crisis (2007-2009), European Sovereign Debt Crisis (2010-2014), and Covid-19 Pandemic (2020-2021) - Panel OLS-FE

$MacroPru_{c,t}$ =	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$LTV_{c,t}$
Controls	(1)	(2)	(3)	(4)	(5)
Controls interacted with Great Moderation$_t = 1$					
$MacroPru_{c,t}$	0.154	0.0661	0.0970	0.130	0.0533**
	(0.220)	(0.217)	(0.215)	(0.216)	(0.0233)
$MacroPru_{c,t} \times EFD_i$	-0.510	-0.132	-0.197	-0.320	0.0178*
	(0.537)	(0.518)	(0.524)	(0.531)	(0.0102)
$MacroPru_{c,t-1} \times EFD_i$			-0.406	-0.336	
			(0.395)	(0.406)	
$MacroPru_{c,t-2} \times EFD_i$				-0.293	
				(0.423)	
$CumulativeTPI_{c,t-1}$	-0.443***				
$\times EFD_i$	(0.150)				
Controls interacted with Great Financial Crisis$_t = 1$					
$MacroPru_{c,t}$	0.113	0.0194	0.0568	0.0886	0.0234
	(0.172)	(0.166)	(0.166)	(0.167)	(0.0248)
$MacroPru_{c,t} \times EFD_i$	0.0101	0.359	0.0593	-0.0367	-0.0108
	(0.435)	(0.400)	(0.416)	(0.419)	(0.0117)
$MacroPru_{c,t-1} \times EFD_i$			0.686	0.670	
			(0.419)	(0.413)	
$MacroPru_{c,t-2} \times EFD_i$				-0.159	
				(0.344)	
$CumulativeTPI_{c,t-1}$	-0.140*				
$\times EFD_i$	(0.0814)				

Table C.2 (Part 3): Effects on industries' growth of macroprudential policies, with interactions for different periods: Great Moderation (1991-2006), Great Financial Crisis (2007-2009), European Sovereign Debt Crisis (2010-2014), and Covid-19 Pandemic (2020-2021) - Panel OLS-FE

$MacroPru_{c,t}$ =	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$LTV_{c,t}$
Controls	(1)	(2)	(3)	(4)	(5)
Controls interacted with European Sovereign Debt Crisis$_t = 1$					
$MacroPru_{c,t}$	0.171	0.112	0.138	0.163	0.0213
	(0.159)	(0.153)	(0.153)	(0.156)	(0.0161)
$MacroPru_{c,t} \times EFD_i$	-0.241	-0.0431	-0.181	-0.267	0.000192
	(0.300)	(0.243)	(0.277)	(0.293)	(0.00872)
$MacroPru_{c,t-1} \times EFD_i$			-0.00393	-0.00735	
			(0.244)	(0.268)	
$MacroPru_{c,t-2} \times EFD_i$				-0.115	
				(0.291)	
$CumulativeTPI_{c,t-1}$	-0.0424				
$\times EFD_i$	(0.0423)				
Controls interacted with Covid-19 Pandemic$_t = 1$					
$MacroPru_{c,t}$	0.261	0.189	0.223	0.224	-0.0134
	(0.189)	(0.186)	(0.190)	(0.194)	(0.0188)
$MacroPru_{c,t} \times EFD_i$	0.289	0.496	0.285	0.319	0.0484***
	(0.372)	(0.350)	(0.383)	(0.396)	(0.0106)
$MacroPru_{c,t-1} \times EFD_i$			0.423	0.333	
			(0.321)	(0.325)	
$MacroPru_{c,t-2} \times EFD_i$				0.736**	
				(0.349)	
$CumulativeTPI_{c,t-1}$	0.119***				
$\times EFD_i$	(0.0350)				

Table C.2 (Part 4): Effects on industries' growth of macroprudential policies, with interactions for different periods: Great Moderation (1991-2006), Great Financial Crisis (2007-2009), European Sovereign Debt Crisis (2010-2014), and Covid-19 Pandemic (2020-2021) - Panel OLS-FE

$MacroPru_{c,t}$ =	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$LTV_{c,t}$
Controls	(1)	(2)	(3)	(4)	(5)
Controls without any interactions					
$ShareManVA_{i,c,t-1}$	-0.242***	-0.243***	-0.238***	-0.249***	-0.230***
	(0.0508)	(0.0500)	(0.0504)	(0.0516)	(0.0527)
$\ln(GDP^{PPP,pc}_{c,t-1})$	-4.902***	-4.099***	-4.194***	-4.031***	-5.063***
	(0.956)	(0.849)	(0.854)	(0.864)	(0.879)
$g^{GDP}_{c,t-1}$	-0.215***	-0.223***	-0.218***	-0.225***	-0.218***
	(0.0392)	(0.0390)	(0.0392)	(0.0390)	(0.0418)
$inflation_{c,t-1}$	-0.00674***	-0.00689***	-0.00679***	-0.00679***	-0.00689***
	(0.00124)	(0.00124)	(0.00124)	(0.00124)	(0.00124)
$g^{GDP}_{c,t}$	1.236***	1.242***	1.239***	1.227***	1.266***
	(0.0540)	(0.0538)	(0.0540)	(0.0549)	(0.0541)
$inflation_{c,t}$	-0.000210	-5.73e-05	3.94e-05	-1.24e-06	0.000407
	(0.00381)	(0.00382)	(0.00382)	(0.00381)	(0.00381)
$MPR_{c,t}$	0.00217	0.00208	0.00203	0.00204	0.00195
	(0.00164)	(0.00164)	(0.00164)	(0.00164)	(0.00164)
$ZLB_{c,t}$	0.288	0.276	0.283	0.347	0.0718
	(0.287)	(0.282)	(0.285)	(0.288)	(0.264)
N	31,313	31,526	31,313	30,979	27,623
R^2 (overall)	0.248	0.247	0.248	0.247	0.289

Robust standard-errors in (). ***,**,* denote 1%, 5%, 10% statistical significance.
Clusters by industry-country.
All regressions include fixed-effects by industry-country and year (omitted).

The impact of macroprudential policies on industrial growth Appendix D: Estimates with country governance controls and asset market capitalization

Carlos Madeira

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Abstract

This online appendix shows the results of an exercise that considers both interactions for the domestic private credit growth and additional controls for the countries' institutional quality (as measured by the World Governance Indicators published by the World Bank).

Table D.1 shows that, of the countries that have a high market capitalization over GDP, around 77% (10 countries in a total of 13) also have a high domestic private credit over GDP. The other remaining 23% (3 in 13) of the countries with a high market capitalization have at least a middle level of domestic private credit.

Table D.2 shows that all the World Governance Indicators are strongly correlated with GDP per capita, which is a good measure of overall development.

Table D.3 shows the regressions exercise with a constant and domestic private credit growth interactions and with institutional quality variables as additional controls. The World Governance Indicators include Control of Corruption, Government Effectiveness, Political Stability and Absence of Violence/Terrorism, Regulatory Quality, Rule of Law, Voice and Accountability.

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Table D.1: Distribution of countries, according to their Market Capitalization of Listed Companies (% of GDP) and Domestic credit to private sector (% of GDP) in the year 2019

Number of countries in each cell	Domestic credit type		
Market Capitalization Type	Low credit	Middle credit	High credit
93 countries in the World Bank data			
Low capitalization	7	15	6
Middle capitalization	1	14	22
High capitalization	0	8	20
49 countries in both World Bank and UNIDO data			
Low capitalization	2	10	5
Middle capitalization	0	6	10
High capitalization	0	3	13

Both of the variables Market Capitalization of Listed Companies (% of GDP) and Domestic credit to private sector (% of GDP) come from the World Bank.

"Low capitalization" corresponds to countries equal or lower than 30% of the countries in terms of Market Capitalization (% of GDP). "High capitalization" corresponds to countries equal or above than 70% of the countries in terms of Market Capitalization (% of GDP). "Middle capitalization" are the remaining countries.

"Low credit" corresponds to countries equal or lower than 30% of the countries in terms of Domestic credit to private sector (% of GDP). "High credit" corresponds to countries equal or above than 70% of the countries in terms of Domestic credit to private sector (% of GDP). "Middle credit" are the remaining countries.

Table D.2: Correlation coefficients of the GDP per capita in 2017 USD in PPP (in log) with the World Governance Indicators in the year 2019

Indicator	Correlation coefficients (in %)	
Period (Years)	2019	1996-2022
Control of Corruption: Estimate	71.2	70.5
Government Effectiveness: Percentile Rank	84.1	80.2
Political Stability and Absence of Violence/Terrorism: Percentile Rank	59.4	58.7
Regulatory Quality: Percentile Rank	81.9	78.3
Rule of Law: Percentile Rank	75.2	71.2
Voice and Accountability: Percentile Rank	52.5	54.0

Table D.3 (Part 1): Effect on industries' growth of the macroprudential policies interacted with the domestic private credit over GDP ratio: Panel OLS-FE

Additional controls for Market Capitalization of Listed Companies over GDP and for the World Governance Indicators					
$MacroPru_{c,t}$ =	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$LTV_{c,t}$
Controls	(1)	(2)	(3)	(4)	(5)
Controls interacted with $Constant = 1$					
$MacroPru_{c,t}$	0.0242	0.00659	-0.0107	0.0109	-0.0829***
	(0.0636)	(0.0613)	(0.0626)	(0.0635)	(0.0253)
$MacroPru_{c,t-1}$			0.101	0.110	
			(0.0712)	(0.0716)	
$MacroPru_{c,t-2}$				0.0320	
				(0.0991)	
$MacroPru_{c,t} \times EFD_i$	-0.151	-0.184*	-0.123	-0.115	0.172***
	(0.139)	(0.112)	(0.133)	(0.136)	(0.0571)
$MacroPru_{c,t-1} \times EFD_i$			-0.427***	-0.387**	
			(0.155)	(0.155)	
$MacroPru_{c,t-2} \times EFD_i$				-0.186	
				(0.227)	
$CumulativeTPI_{c,t-1}$	0.0651**				
	(0.0302)				
$CumulativeTPI_{c,t-1}$	-0.0881*				
$\times EFD_i$	(0.0510)				
Controls interacted with ($\Delta DomesticPrivateCreditOverGDP_{c,t}$)					
$MacroPru_{c,t}$	-0.00529	-0.00456	-0.00380	-0.00521	-8.94e-05
	(0.00641)	(0.00597)	(0.00665)	(0.00678)	(0.000194)
$MacroPru_{c,t-1}$			-0.00217	-0.0211*	
			(0.00976)	(0.0111)	
$MacroPru_{c,t-2}$				0.0258***	
				(0.00833)	
$MacroPru_{c,t} \times EFD_i$	0.0119	0.0198	0.0165	0.0140	0.000291
	(0.0168)	(0.0158)	(0.0179)	(0.0184)	(0.000445)
$MacroPru_{c,t-1} \times EFD_i$			0.0106	0.00737	
			(0.0244)	(0.0285)	
$MacroPru_{c,t-2} \times EFD_i$				0.0110	
				(0.0191)	
$CumulativeTPI_{c,t-1}$	0.000491				
	(0.00149)				
$CumulativeTPI_{c,t-1}$	0.00488				
$\times EFD_i$	(0.00313)				

Table D.3 (Part 2): Effect on industries' growth of the macroprudential policies interacted with the domestic private credit over GDP ratio: Panel OLS-FE

Additional controls for Market Capitalization of Listed Companies over GDP and for the World Governance Indicators					
$MacroPru_{c,t}$ =	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$TPI_{c,t}$	$LTV_{c,t}$
Controls	(1)	(2)	(3)	(4)	(5)
Controls without interactions					
$ShareManVA_{i,c,t-1}$	-0.189***	-0.198***	-0.190***	-0.187***	-0.177***
	(0.0541)	(0.0549)	(0.0552)	(0.0542)	(0.0595)
$\ln(GDP^{PPP,pc}_{c,t-1})$	-7.910***	-6.965***	-7.043***	-6.868***	-8.945***
	(1.378)	(1.237)	(1.239)	(1.249)	(1.277)
$DomesticPrivate$	-0.00130	-0.00108	-0.00124	-0.00235	-0.00315
$CreditOverGDP_{c,t-2}$	(0.00495)	(0.00493)	(0.00493)	(0.00490)	(0.00545)
Market Capitalization	0.00745***	0.00800***	0.00800***	0.00767***	0.00777***
over GDP ratio$_{c,t}$	(0.00158)	(0.00156)	(0.00159)	(0.00159)	(0.00159)
Control of Corruption:	-1.608**	-1.586**	-1.555**	-1.471**	-1.337*
Estimate$_{c,t}$	(0.744)	(0.744)	(0.746)	(0.747)	(0.757)
Government Effectiveness:	0.0150	0.0278	0.0275	0.0283	0.0461*
Percentile Rank$_{c,t}$	(0.0272)	(0.0263)	(0.0266)	(0.0266)	(0.0267)
Political Stability and	-0.0148	-0.0218	-0.0220	-0.0166	-0.0152
Absence of Violence/	(0.0138)	(0.0138)	(0.0138)	(0.0135)	(0.0138)
Terrorism: Percentile Rank$_{c,t}$					
Regulatory Quality:	0.000296	-0.00731	-0.00724	-0.00967	-8.69e-05
Percentile Rank$_{c,t}$	(0.0270)	(0.0269)	(0.0270)	(0.0271)	(0.0275)
Rule of Law:	0.00844	0.0202	0.0199	0.00899	0.00786
Percentile Rank$_{c,t}$	(0.0332)	(0.0332)	(0.0332)	(0.0331)	(0.0332)
Voice and Accountability:	0.0130	0.00722	0.00766	0.0172	0.0126
Percentile Rank$_{c,t}$	(0.0319)	(0.0322)	(0.0320)	(0.0320)	(0.0314)
Other controls:					
$g^{GDP}_{c,t-1}, inflation_{c,t-1}$	Yes	Yes	Yes	Yes	Yes
$g^{GDP}_{c,t}, inflation_{c,t}$	Yes	Yes	Yes	Yes	Yes
$MPR_{c,t}, ZLB_{c,t}$	Yes	Yes	Yes	Yes	Yes
N	16,368	16,368	16,368	16,368	15,501
R^2 (overall)	0.330	0.329	0.329	0.331	0.348

Robust standard-errors in (). ***,**,* denote 1%, 5%, 10% statistical significance.
Clusters by industry-country.
All regressions include fixed-effects by industry-country and year (omitted).