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Do Financial Sector Reforms Lead to Financial Development? Evidence from a New Dataset

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Abstract

This paper studies whether the policies that, over the past decades, liberalized banking systems around the world have resulted in deeper credit markets. To measure banking sector reforms we use a new index that tracks policy changes in five separate areas for 91 countries over 1973–2005. We find that reforms have led to financial deepening, but only in countries with institutions that place checks and balances on political power. We interpret this as evidence of a complementarity between financial sector reforms and political institutions that protect property rights. Other country characteristics do not seem to significantly influence the effect of banking reforms on financial development.

JEL Classification Numbers: O16, G28, G18

Table 1. Sample Countries

1	Albania	43	Kazakhstan
2	Algeria	44	Kenya
3	Argentina	45	Korea
4	Australia	46	Kyrgyz Republic
5	Austria	47	Latvia
6	Bangladesh	48	Lithuania
7	Belgium	49	Madagascar
8	Bolivia	50	Malaysia
9	Brazil	51	Mexico
10	Bulgaria	52	Morocco
11	Burkina Faso	53	Mozambique
12	Cameroon	54	Nepal
13	Canada	55	Netherlands
14	Chile	56	New Zealand
15	Colombia	57	Nicaragua
16	Costa Rica	58	Nigeria
17	Cote d'Ivoire	59	Norway
18	Czech Republic	60	Pakistan
19	Denmark	61	Paraguay
20	Dominican Republic	62	Peru
21	Ecuador	63	Philippines
22	Egypt	64	Poland
23	El Salvador	65	Portugal
24	Estonia	66	Romania
25	Ethiopia	67	Russia
26	Finland	68	Senegal
27	France	69	Singapore
28	Georgia	70	South Africa
29	Germany	71	Spain
30	Ghana	72	Sri Lanka
31	Greece	73	Sweden
32	Guatemala	74	Switzerland
33	Hong Kong	75	Tanzania
34	Hungary	76	Thailand
35	India	77	Tunisia
36	Indonesia	78	Turkey
37	Ireland	79	Uganda
38	Israel	80	United Kingdom
39	Italy	81	United States
40	Jamaica	82	Uruguay
41	Japan	83	Venezuela
42	Jordan	84	Vietnam
		85	Zimbabwe

Figure 1: Financial Reforms by regions

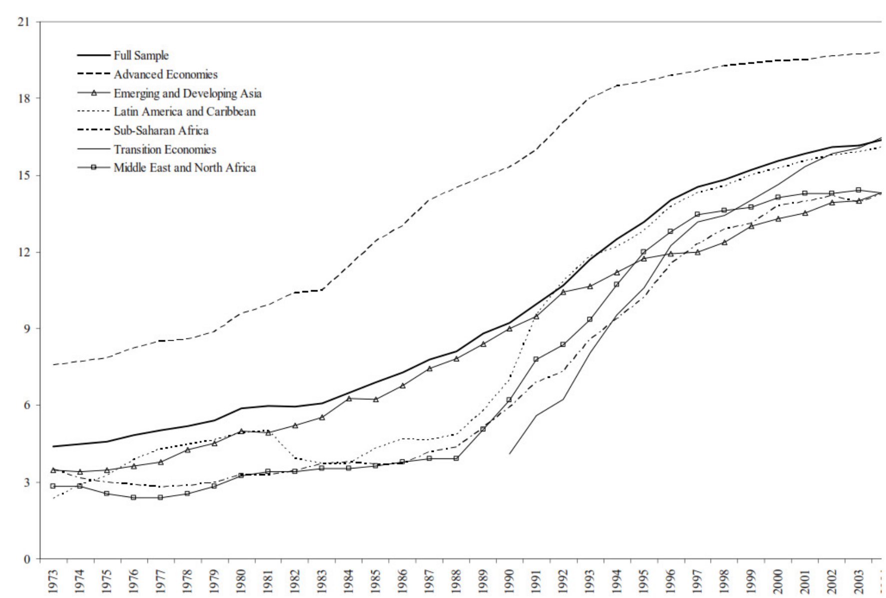

Figure 2: Private credit to GDP around episodes of banking reforms

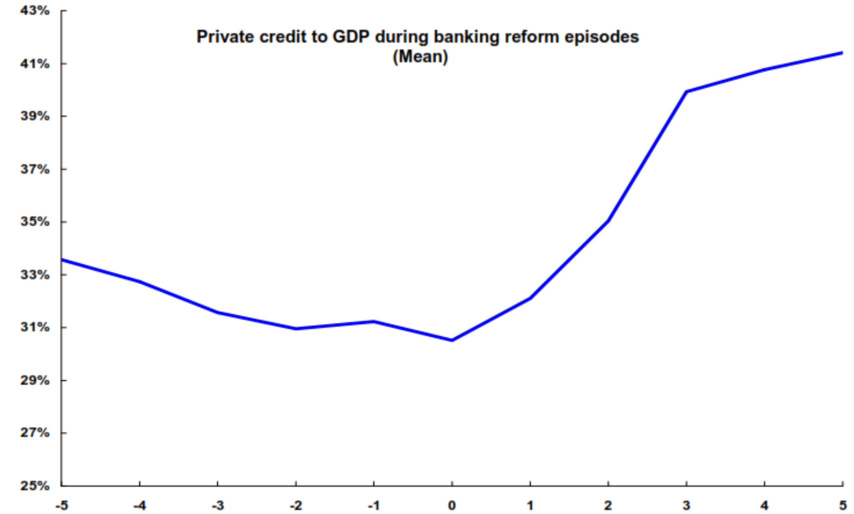

Table 2. Summary Statistics

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Private credit to GDP	1744	42.00%	35.10%	1.10%	200.70%
Growth of private credit to GDP	1744	2.10%	12.60%	-131.30%	71.10%
Index of banking reform	1744	0.54	0.28	0	1
Change in banking reform index	1744	0.02	0.05	-0.27	0.33
Banking reform subindices:					
Directed credit subindex	1744	0.54	0.33	0	1
Interest rate subindex	1744	0.71	0.4	0	1
Competition subindex	1744	0.66	0.37	0	1
Supervision subindex	1744	0.31	0.33	0	1
Privatisation subindex	1744	0.48	0.39	0	1
Inflation	1744	12.80%	32.30%	-9.80%	1058.40%
Log (GDP per capita)	1744	8.7	1.1	5.9	10.5
Constraints on the Executive (Polity IV)	1587	5.2	2.1	1	7
Creditor rights index	1658	1.9	1.2	0	4
Common law dummy variable	1744	34%	47%	0	1
Contract enforcement (days)	1574	543.305	195.9692	120	980
General Government Balance to GDP	1553	-3.10%	4.60%	-25.80%	15.50%
Securities market subindex	1744	0.57	0.36	0	1
International capital flows subindex	1744	0.63	0.35	0	1
Capital account index (Chinn & Ito)	1717	0.33	1.54	-1.77	2.6
Average tariff index	1602	0.15	0.13	0	1

Table 3. Cross-Correlations

	Private credit to GDP	Growth in private credit to GDP	Index of Banking Reforms	Change in Banking Reform Index	Inflation	Log (GDP per capita)	Fiscal balance to GDP	Securities Market subindex	Capital flows subindex	Index of average tariff
Private credit to GDP	1									
Growth in private credit to GDP	0.007	1.000								
	0.761									
Index of banking reforms	0.431	0.038	1.000							
	0.000	*0.078*								
Change in Banking Reform Index	-0.086	0.007	0.112	1.000						
	0.000	*0.748*	*0.000*							
Inflation	-0.069	0.035	-0.083	0.091	1.000					
	0.001	*0.111*	*0.000*	*0.000*						
Log (GDP per capita)	0.652	0.006	0.511	-0.009	-0.025	1.000				
	0.000	*0.784*	*0.000*	*0.652*	*0.214*					
Fiscal balance to GDP	0.205	0.068	0.325	0.013	-0.129	0.243	1			
	0.000	*0.004*	*0.000*	*0.546*	*0.000*	*0.000*				
Securities market index	0.553	0.040	0.738	0.011	-0.086	0.667	0.317	1.000		
	0.000	*0.067*	*0.000*	*0.563*	*0.000*	*0.000*	*0.000*			
Capital flows index	0.461	0.046	0.708	0.055	-0.086	0.542	0.245	0.676	1	
	0.000	*0.033*	*0.000*	*0.006*	*0.000*	*0.000*	*0.000*	*0.000*		
Average tariff index	-0.385	-0.029	-0.595	-0.023	0.044	-0.562	-0.253	-0.517	-0.559	1.000
	0.000	*0.223*	*0.000*	*0.308*	*0.052*	*0.000*	*0.000*	*0.000*	*0.000*	

p-values are in italics

Table 4. Baseline Regression: Two Alternative Maximum Lags

	(1)	(2)	(3)	(4)	(5)	(6)
Sample:	Full	Advanced	Developing	Full	Advanced	Developing
Banking reform index (t-2)	0.095***	0.054*	0.092**			
	[0.032]	[0.026]	[0.045]			
Banking reform index (t-5)				0.054	0.056**	0.023
				[0.040]	[0.027]	[0.060]
Δ Banking reform index	0.065	0.082*	0.063	0.067	0.071	0.072
	[0.063]	[0.042]	[0.091]	[0.065]	[0.044]	[0.097]
Δ Banking reform index (t-1)	0.210***	0.058	0.275***	0.130**	0.021	0.181**
	[0.053]	[0.044]	[0.072]	[0.057]	[0.036]	[0.085]
Δ Banking reform index (t-2)				0.115***	0.064	0.132*
				[0.043]	[0.038]	[0.067]
Δ Banking reform index (t-3)				0.042	0.07	0.003
				[0.057]	[0.056]	[0.079]
Δ Banking reform index (t-4)				0.057	0.066	0.048
				[0.050]	[0.041]	[0.074]
Log (private credit / GDP) (t-2)	-0.095***	-0.037***	-0.110***			
	[0.011]	[0.011]	[0.012]			
Log (private credit / GDP) (t-5)				-0.111***	-0.054***	-0.126***
				[0.013]	[0.016]	[0.013]
Δ log (private credit / GDP) (t-1)	0.356***	0.520***	0.339***	0.385***	0.618***	0.354***
	[0.027]	[0.041]	[0.030]	[0.037]	[0.053]	[0.036]
Δ log (private credit / GDP) (t-2)				-0.194***	-0.262***	-0.199***
				[0.033]	[0.055]	[0.034]
Δ log (private credit / GDP) (t-3)				0.002	0.134**	-0.015
				[0.027]	[0.055]	[0.027]
Δ log (private credit / GDP) (t-4)				-0.077***	-0.108**	-0.081***
				[0.023]	[0.045]	[0.026]
Inflation (t-2)	-0.005	-0.001	-0.005			
	[0.005]	[0.005]	[0.006]			
Inflation (t-5)				-0.042**	-0.004	-0.068***
				[0.020]	[0.006]	[0.018]
Δ Inflation	-0.009	-0.016***	-0.009	-0.035***	-0.012	-0.045***
	[0.006]	[0.005]	[0.006]	[0.010]	[0.008]	[0.013]
Δ Inflation (t-1)	-0.005	0.01	-0.006	-0.096***	0.012	-0.117***
	[0.005]	[0.006]	[0.006]	[0.017]	[0.011]	[0.019]
Δ Inflation (t-2)				-0.040**	-0.013	-0.066***
				[0.020]	[0.008]	[0.018]
Δ Inflation (t-3)				-0.042**	0.023	-0.068***
				[0.020]	[0.013]	[0.019]
Δ Inflation (t-4)				-0.042**	-0.009	-0.068***
				[0.020]	[0.010]	[0.018]

Table 4. Baseline Regression: Exploring Various Lag Structures (continued)

Sample:	(1) Full	(2) Advanced	(3) Developing	(4) Full	(5) Advanced	(6) Developing
Log (GDP per capita) (t-2)	0.126***	0.078**	0.140***			
	[0.023]	[0.028]	[0.023]			
Log (GDP per capita) (t-5)				0.129***	0.059*	0.142***
				[0.031]	[0.032]	[0.034]
Δ log(GDP per capita)	-0.02	-0.129	-0.023	-0.045	-0.273	-0.036
	[0.086]	[0.143]	[0.092]	[0.087]	[0.191]	[0.091]
Δ log(GDP per capita) (t-1)	0.701***	0.688***	0.697***	0.632***	0.782***	0.600***
	[0.072]	[0.080]	[0.079]	[0.071]	[0.121]	[0.075]
Δ log(GDP per capita) (t-2)				0.162	0.148	0.142
				[0.107]	[0.152]	[0.115]
Δ log(GDP per capita) (t-3)				0.266***	0.342	0.264***
				[0.061]	[0.209]	[0.069]
Δ log(GDP per capita) (t-4)				0.171***	-0.015	0.184***
				[0.061]	[0.173]	[0.069]
Long-run effect—Banking reform index	**1.006*** **	**1.465**	**0.840*** **	**0.488**	**1.049* **	**0.179**
	[0.359]	**[0.955]**	**[0.403]**	**[0.372]**	**[0.593]**	**[0.474]**
Observations	2034	620	1414	1744	532	1212
R-squared	0.43	0.54	0.44	0.49	0.61	0.5

Regressions include country and year fixed effects and observations are clustered by country
Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 6. Regressions countries with good property rights

Robustness tests

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					Control variable:			
	Only LDCs	Above median property rights (IRIS-ICRG)	(1) + dropping extreme private credit to GDP	dropping political instability episodes	*Fiscal balance to GDP*	*Securities market liberalization*	*Capital account liberalization*	*Average tariff index*
Banking reform index (t-5)	**0.164***	**0.162***	**0.116*****	**0.103****	**0.194*****	**0.137*****	**0.121****	**0.157****
	[0.086]	**[0.088]**	**[0.040]**	**[0.050]**	**[0.048]**	**[0.045]**	**[0.046]**	**[0.062]**
Δ Banking reform index	-0.053	0.085	0.031	0.053	0.035	0.051	0.05	0.038
	[0.123]	[0.136]	[0.056]	[0.055]	[0.067]	[0.064]	[0.066]	[0.082]
Δ Banking reform index (t-1)	0.253*	0.116	0.112***	0.088	0.167*	0.176***	0.153**	0.144
	[0.140]	[0.137]	[0.056]	[0.076]	[0.087]	[0.065]	[0.063]	[0.093]
Δ Banking reform index (t-2)	0.105	0.065	0.109**	0.05	0.130**	0.115**	0.102**	0.1
	[0.095]	[0.076]	[0.051]	[0.041]	[0.053]	[0.047]	[0.049]	[0.067]
Δ Banking reform index (t-3)	0.104	0.193***	0.105*	0.058	0.132**	0.098	0.08	0.106
	[0.109]	[0.060]	[0.061]	[0.068]	[0.059]	[0.062]	[0.063]	[0.070]
Δ Banking reform index (t-4)	0.265*	0.248***	0.146**	0.055	0.202**	0.158**	0.146**	0.173**
	[0.146]	[0.082]	[0.058]	[0.062]	[0.080]	[0.064]	[0.064]	[0.086]
Log (private credit / GDP) (t-5)	-0.188***	-0.175***	-0.096***	-0.103***	-0.141***	-0.100***	-0.101***	-0.160***
	[0.028]	[0.034]	[0.027]	[0.024]	[0.029]	[0.025]	[0.026]	[0.028]
Δ log (private credit / GDP) (t-1)	0.279***	0.209*	0.427***	0.444***	0.427***	0.440***	0.437***	0.391***
	[0.062]	[0.120]	[0.054]	[0.065]	[0.053]	[0.052]	[0.050]	[0.053]
Δ log (private credit / GDP) (t-2)	-0.315***	-0.242***	-0.267***	-0.275***	-0.297***	-0.286***	-0.286***	-0.312***
	[0.067]	[0.090]	[0.057]	[0.053]	[0.062]	[0.053]	[0.052]	[0.050]
Δ log (private credit / GDP) (t-3)	-0.038	-0.081	0.056	0.038	0.012	0.042	0.045	0.015
	[0.054]	[0.072]	[0.049]	[0.045]	[0.048]	[0.051]	[0.048]	[0.052]
Δ log (private credit / GDP) (t-4)	-0.180***	-0.094	-0.126***	-0.124***	-0.140***	-0.135***	-0.131***	-0.135***
	[0.052]	[0.059]	[0.033]	[0.033]	[0.043]	[0.034]	[0.029]	[0.040]
Control variable (t-5)	.	.	.	.	0.001	-0.01	0.015	0.074
					[0.002]	[0.025]	[0.021]	[0.072]
Δ Control variable	.	.	.	.	0.002	-0.044	-0.013	-0.087
					[0.003]	[0.036]	[0.030]	[0.089]
Δ Control variable (t-1)	.	.	.	.	0.002	0.017	0.022	-0.018
					[0.003]	[0.029]	[0.019]	[0.060]
Δ Control variable (t-2)	.	.	.	.	0.005	0.009	0.028	0.043
					[0.003]	[0.030]	[0.023]	[0.067]
Δ Control variable (t-3)	.	.	.	.	0.003*	0.013	0.009	-0.03
					[0.002]	[0.030]	[0.018]	[0.123]
Δ Control variable (t-4)	.	.	.	.	0.003	0.007	0.024	0.133
					[0.002]	[0.033]	[0.023]	[0.113]
Long-run effect	**0.870***	**0.924****	**1.316****	**0.994***	**1.375*****	**1.375****	**1.197****	**0.985****
	[0.454]	**[0.422]**	**[0.596]**	**[0.557]**	**[0.319]**	**[0.630]**	**[0.591]**	**[0.432]**
Observations	428	654	893	1003	751	911	911	681
R-squared	0.68	0.65	0.56	0.58	0.66	0.6	0.6	0.67

Note: all regressions include country and year fixed effects, and the 5 lags of inflation and GDP per capita as control variables.
Robust standard errors in brackets, observations clustered by country, *** p<0.01, ** p<0.05, * p<0.1 .

Table 8. Regressions with 5 year period panels

	OLS					2SLS				
Sample	Full	Good Property Rights	Bad Property Rights	Full	Full Excl. supervision	Full	Good Property Rights	Bad Property Rights	Full	Full Excl. supervision
Δ Banking reform subindex (t/t-5)	0.402**	0.717**	0.231	0.391	0.137	-0.36	0.790*	-0.099	0.756	0.321*
	[0.197]	[0.337]	[0.377]	[0.64]	[0.19]	[0.642]	[0.422]	[0.482]	[0.57]	[0.18]
Banking reform subindex (t-5)	0.548*	1.322***	-0.118	-0.219	-0.102	0.248	2.028***	-0.732	-0.041	-0.113
	[0.290]	[0.461]	[0.822]	[0.48]	[0.15]	[0.685]	[0.581]	[0.684]	[0.49]	[0.17]
Δ Banking reform subindex (t/t-5)				-0.005	-0.003				-0.096	-0.039
* Constraint on the executive				[0.12]	[0.04]				[0.14]	[0.04]
Banking reform subindex (t-5)				0.158*	0.054**				0.133	0.069*
* Constraint on the executive				[0.08]	[0.03]				[0.09]	[0.04]
Log (Private credit / GDP) (t-5)	-0.593***	-0.579***	-0.595***	-0.625***	-0.618***	-0.596***	-0.742***	-0.512***	-0.586***	-0.586***
	[0.076]	[0.117]	[0.150]	[0.08]	[0.08]	[0.113]	[0.100]	[0.140]	[0.11]	[0.10]
Δ Inflation (t/t-5)	-0.095	-0.107	-0.235	-0.074	-0.065	-0.205*	-0.100*	-0.37	-0.185*	-0.210**
	[0.089]	[0.112]	[0.259]	[0.08]	[0.09]	[0.109]	[0.058]	[0.372]	[0.09]	[0.10]
Δ Log (GDP per capita) (t/t-5)	0.948***	0.394	0.969*	0.824***	0.831***	0.481*	0.229	0.942**	0.392	0.468*
	[0.332]	[0.458]	[0.575]	[0.30]	[0.30]	[0.277]	[0.359]	[0.377]	[0.25]	[0.27]
Inflation (t-5)	-0.092	-0.108	-0.237	-0.074	-0.068	-0.205*	-0.103*	-0.373	-0.185*	-0.210**
	[0.088]	[0.112]	[0.256]	[0.08]	[0.09]	[0.109]	[0.059]	[0.371]	[0.09]	[0.10]
Log (GDP per capita) (t-5)	0.747***	0.805*	0.761**	0.726***	0.740***	0.544**	0.978***	0.649**	0.634***	0.710***
	[0.171]	[0.454]	[0.294]	[0.15]	[0.17]	[0.212]	[0.334]	[0.297]	[0.16]	[0.18]
Observations	393	162	149	368	368	235	124	102	215	215
R-squared	0.51	0.71	0.52	0.56	0.56	0.5	0.69	0.5	0.55	0.55
Hansen J stat	.	.	.			34.377	32.391	27.583	77.235	74.119
p value	.	.	.			0.1258	0.18051	0.37928	0.01	0.02
First stage F statistics (excl. IVs)										
Δ Banking reform subindex (t/t-5)						3.64	8.68	15.76	19.53	21.69
Banking reform subindex (t-5)						9.23	15.05	10.51	35.01	30.55
Δ Banking reform subindex (t/t-5) * XCONST									22.26	25.82
Banking reform subindex (t-5) * XCONST									44.86	35.1

Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1. Regressions include country and year fixed effects.
Instrumented variables are Δ Banking reform subindex (t/t-5) and Banking reform subindex (t-5), and interactions with constraint on the executive
Instruments include five year change, five year lags, and averages of the changes between t-5 and t-10, of political allies for each of the subcomponents of the financial reform index

Table 9. Impact of specific banking sector reforms on financial depth

Good property right sub-sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Subindex	Directed credit		Interest rate controls		Competition policy		Banking supervision		Privatization	
Sample:	Full	Developing	Full	Developing	Full	Developing	Full	Developing	Full	Developing
Log (private credit / GDP) (t-5)	-0.097***	-0.188***	-0.095***	-0.185***	0.100***	-0.210***	-0.099***	-0.196***	-0.108***	-0.192***
	[0.027]	[0.025]	[0.027]	[0.028]	[0.026]	[0.030]	[0.027]	[0.026]	[0.024]	[0.024]
Δ log (private credit / GDP) (t-1)	0.443***	0.258***	0.454***	0.290***	0.447***	0.255***	0.460***	0.281***	0.446***	0.285***
	[0.053]	[0.067]	[0.052]	[0.060]	[0.053]	[0.065]	[0.053]	[0.059]	[0.051]	[0.066]
Δ log (private credit / GDP) (t-2)	-0.284***	-0.318***	-0.271***	-0.288***	0.288***	-0.327***	-0.280***	-0.320***	-0.278***	-0.300***
	[0.056]	[0.069]	[0.056]	[0.073]	[0.054]	[0.061]	[0.055]	[0.066]	[0.053]	[0.064]
Δ log (private credit / GDP) (t-3)	0.05	-0.037	0.057	-0.034	0.05	-0.056	0.062	-0.017	0.056	-0.029
	[0.051]	[0.056]	[0.051]	[0.055]	[0.054]	[0.056]	[0.048]	[0.044]	[0.046]	[0.046]
Δ log (private credit / GDP) (t-4)	-0.133***	-0.200***	-0.126***	-0.190***	0.134***	-0.204***	-0.126***	-0.200***	-0.135***	-0.188***
	[0.034]	[0.054]	[0.032]	[0.045]	[0.033]	[0.051]	[0.032]	[0.049]	[0.034]	[0.053]
Banking reform subindex (t-5)	**0.060****	**0.090***	**0.026**	**0.013**	**0.050***	**0.103****	**0.001**	**-0.065**	**0.068*****	**0.006**
	[0.024]	**[0.048]**	**[0.019]**	**[0.045]**	**[0.030]**	**[0.050]**	**[0.021]**	**[0.064]**	**[0.022]**	**[0.035]**
Δ Banking reform subindex	-0.015	-0.027	0.02	0.018	0.066*	0.125	-0.031	-0.109*	0.033	-0.037
	[0.027]	[0.043]	[0.021]	[0.037]	[0.035]	[0.076]	[0.024]	[0.058]	[0.041]	[0.060]
Δ Banking reform subindex (t-1)	0.051	0.059	0.05	0.069	0.044	0.093	-0.008	-0.054	0.058*	0.023
	[0.031]	[0.054]	[0.030]	[0.068]	[0.029]	[0.073]	[0.024]	[0.069]	[0.031]	[0.045]
Δ Banking reform subindex (t-2)	0.055**	0.085	0.031	0.022	0.045	0.07	-0.001	-0.094	0.024	-0.007
	[0.026]	[0.056]	[0.022]	[0.053]	[0.029]	[0.073]	[0.034]	[0.076]	[0.022]	[0.034]
Δ Banking reform subindex (t-3)	0.071**	0.118*	0.008	-0.052	0.064	0.166***	-0.005	-0.057	0.025	-0.028
	[0.032]	[0.063]	[0.022]	[0.042]	[0.044]	[0.060]	[0.030]	[0.075]	[0.040]	[0.052]
Δ Banking reform subindex (t-4)	0.057	0.101	0.039**	0.028	0.071**	0.154***	0.017	-0.005	0.024	-0.027
	[0.040]	[0.074]	[0.018]	[0.051]	[0.034]	[0.055]	[0.033]	[0.064]	[0.020]	[0.033]
Observations	911	428	911	428	911	428	911	428	911	428
R-squared	0.6	0.68	0.59	0.67	0.6	0.68	0.59	0.67	0.6	0.67

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in brackets. Regressions also include five lags of inflation and GDP per capita, and country and time fixed effects. Robust standard errors in brackets