Credit during Crisis Times:Trends and determinants in emerging market economies

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Outline

Introduction

- Global financial crisis
  - Housing bubble crisis

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  - Advanced countries
- COVID-19
  - East Asia
  - Restriction on mobility and work

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  - 2002Q1-2008Q3 has been considered Pre-GFC period.
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  - 2002Q1-2008Q3 has been considered Pre-GFC period.
  - 2009Q1-2015Q4 has been considered Post-GFC period.
- COVID-19 period has been considered from 2016Q1-2022Q4
  - 2016Q1-2020Q1 has been considered Pre-COVID-19 period.
  - 2020Q3-2022Q4 has been considered Post-COVID-19 period.

Stylized facts

Credit growth in 13 EMEs

- Blue: Credit growth during GFC period

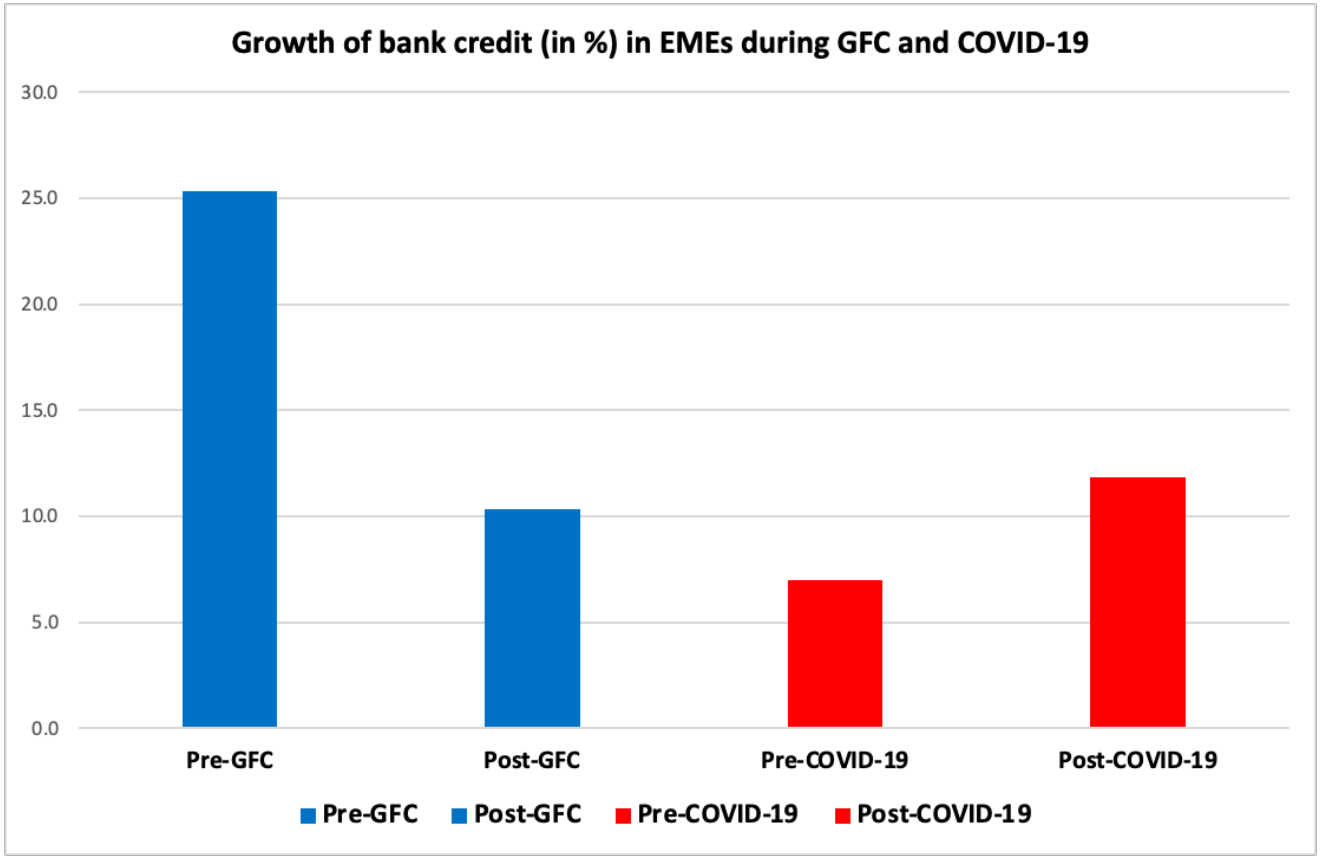

Figure: Credit growth in EMEs during GFC and COVID-19 period (Source: IMF)

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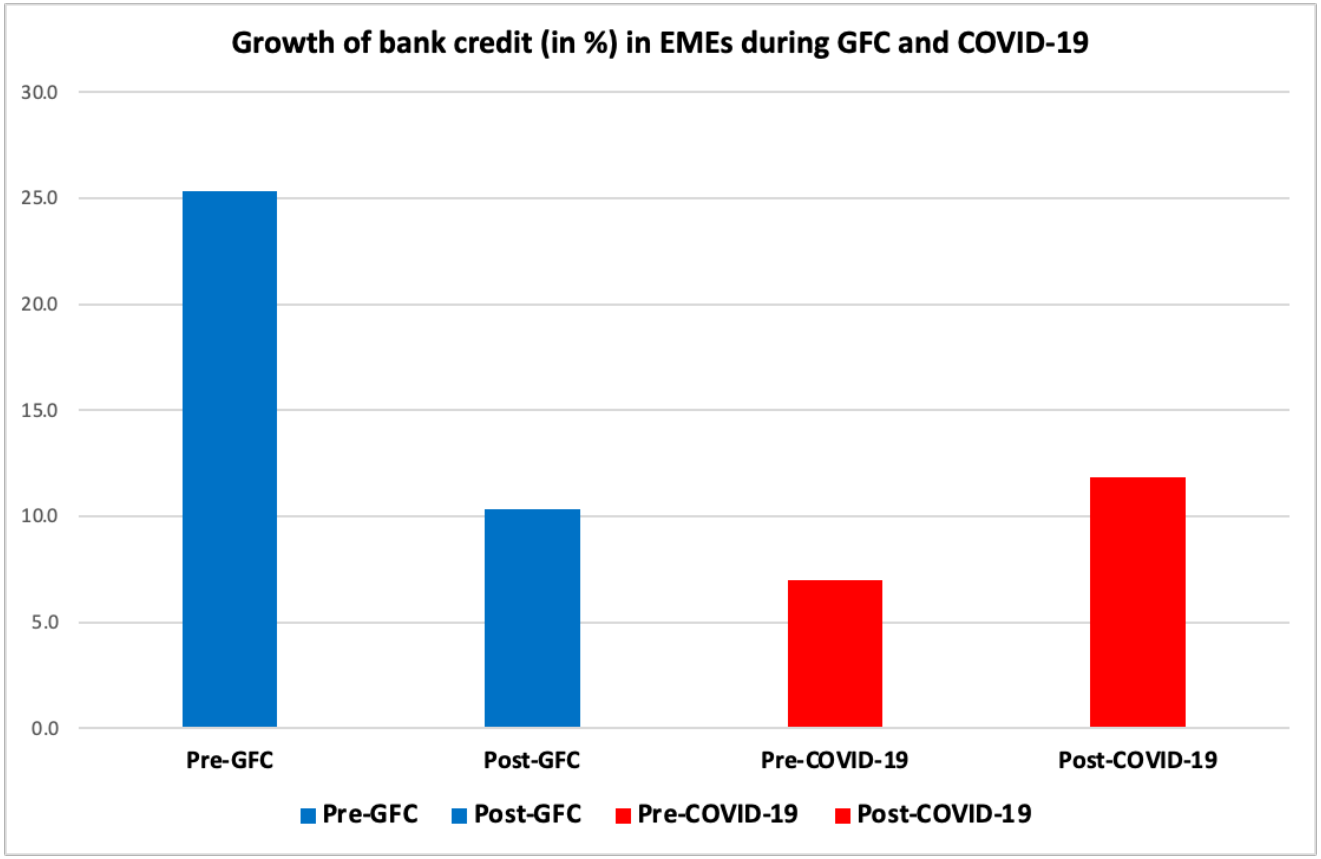
- Blue: Credit growth during GFC period
- Red: Credit growth during COVID-19 period



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Credit growth across regions

- During GFC period

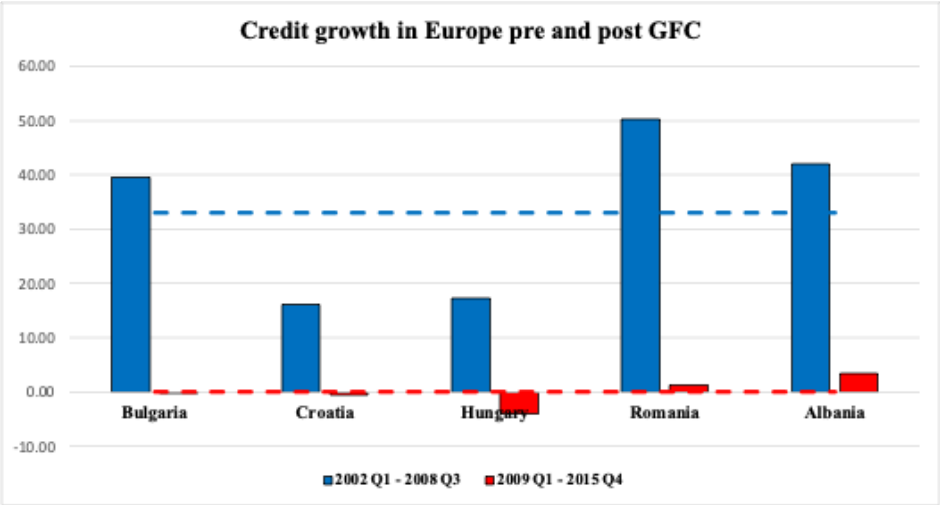


Figure: Credit growth in Europe (Source: IMF)

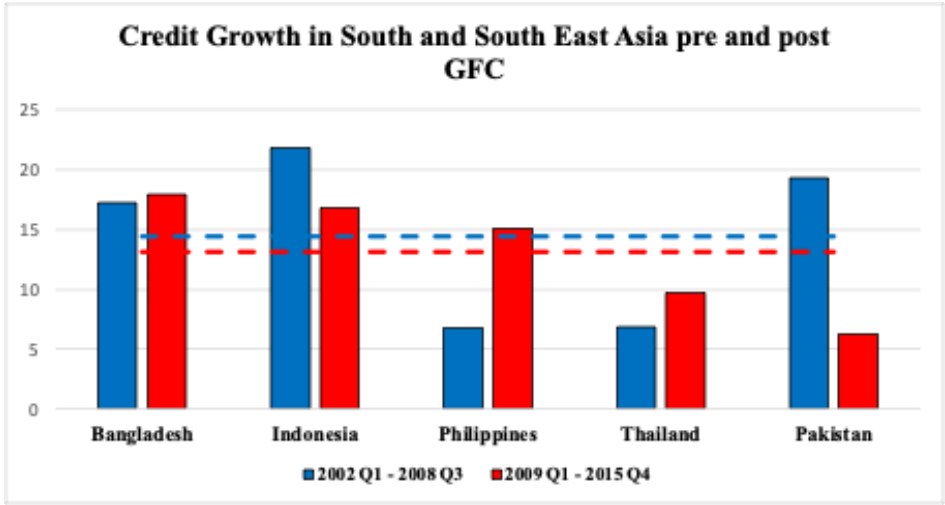
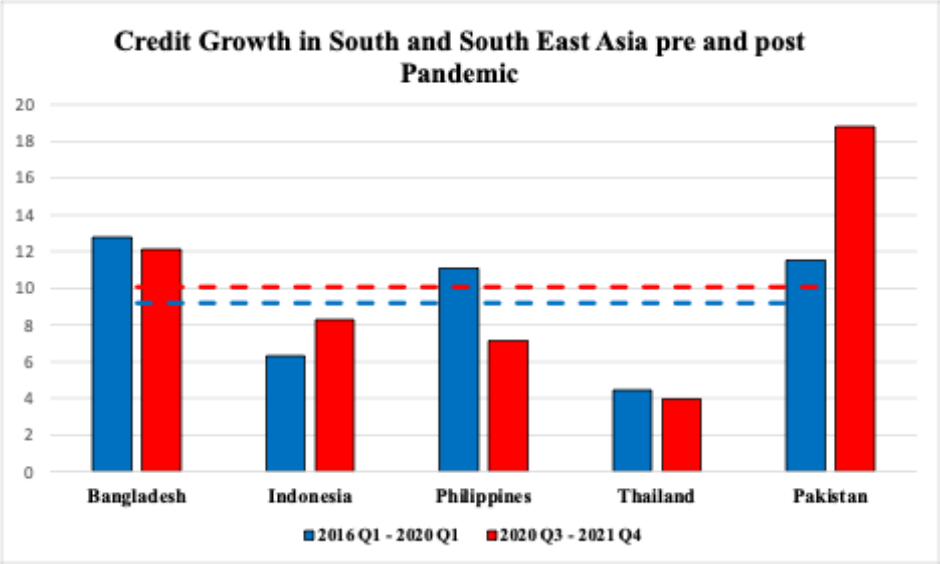


Figure: Credit growth in South and Southeast Asia (Source: IMF)

Stylized facts

Credit growth across regions

- During COVID-19 period



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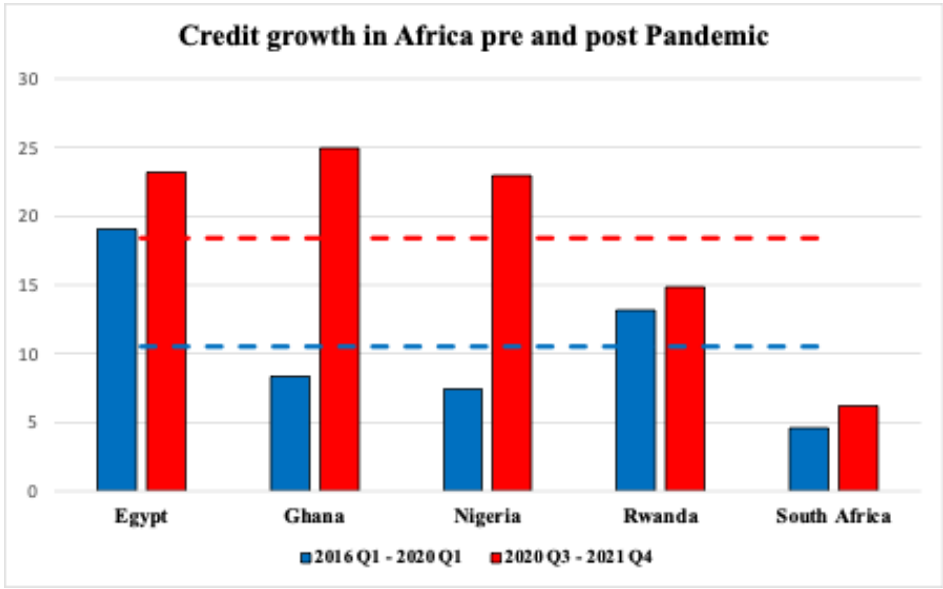

Figure: Credit growth in Africa (Source: IMF)

Stylized facts

Observation on Credit growth

- Credit declined,*ex-post* during GFC while credit increased,*ex-post* during COVID-19. Same for both 13 EMES and across regions
- Credit boom prior to GFC $\rightarrow$ Baseline effect
- Greater global integration and financial inclusion $\rightarrow$ severe credit crunch

Stylized facts

CRAR across regions

- During GFC period

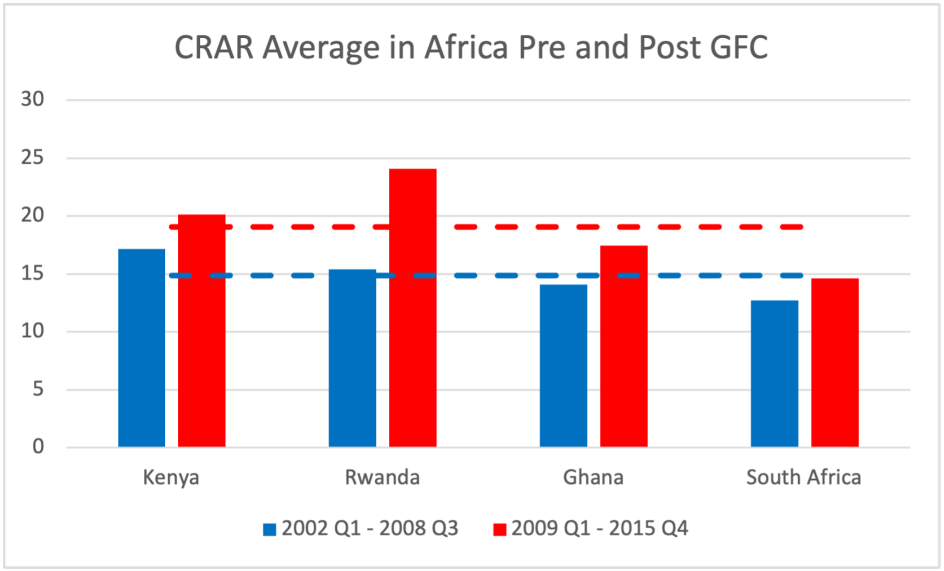

Figure: CRAR in Africa during GFC period (Source: IMF)

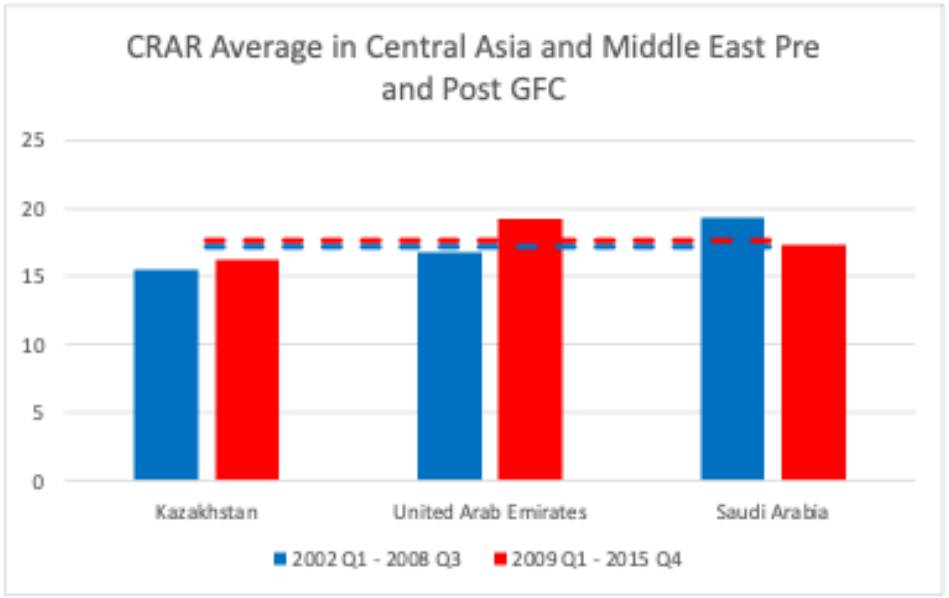

Figure: CRAR in Central Asia and Middle-east (Source: IMF)

Stylized facts

CRAR across regions

- During COVID-19 period

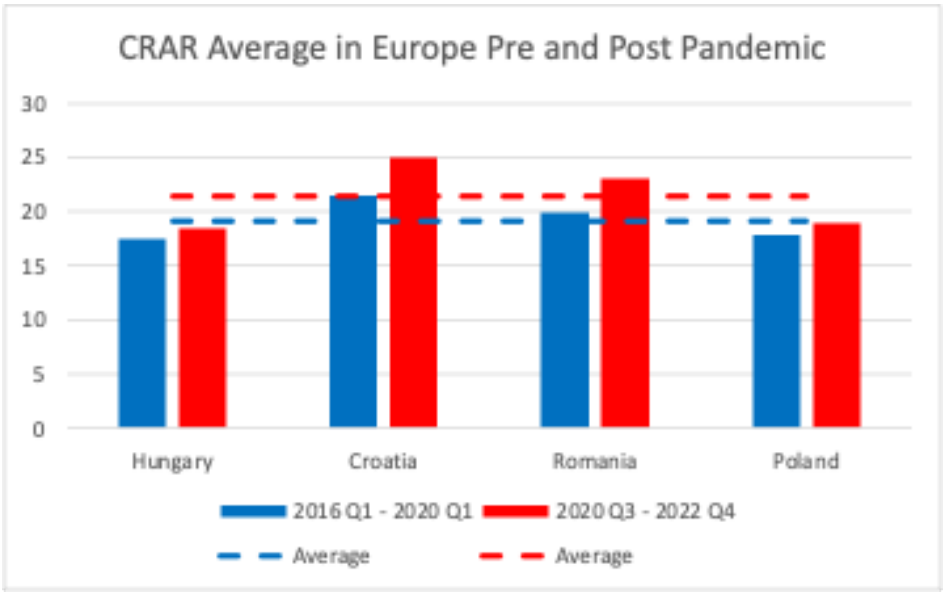

Figure: CRAR in Europe (Source: IMF)

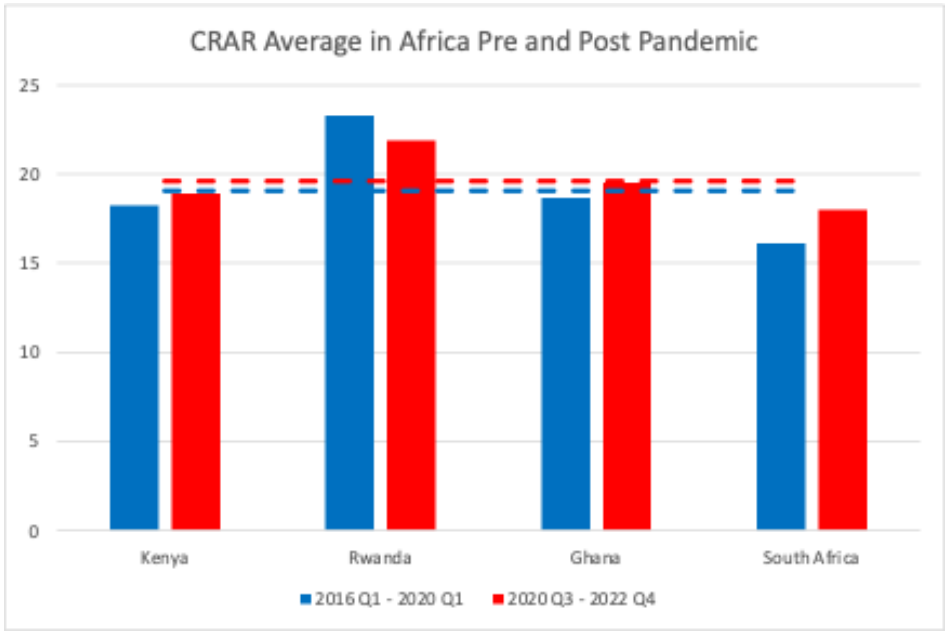

Figure: CRAR in Africa (Source: IMF)

Stylized facts

Stimulus

- Stimulus during 2008 for GFC and 2020 for COVID-19

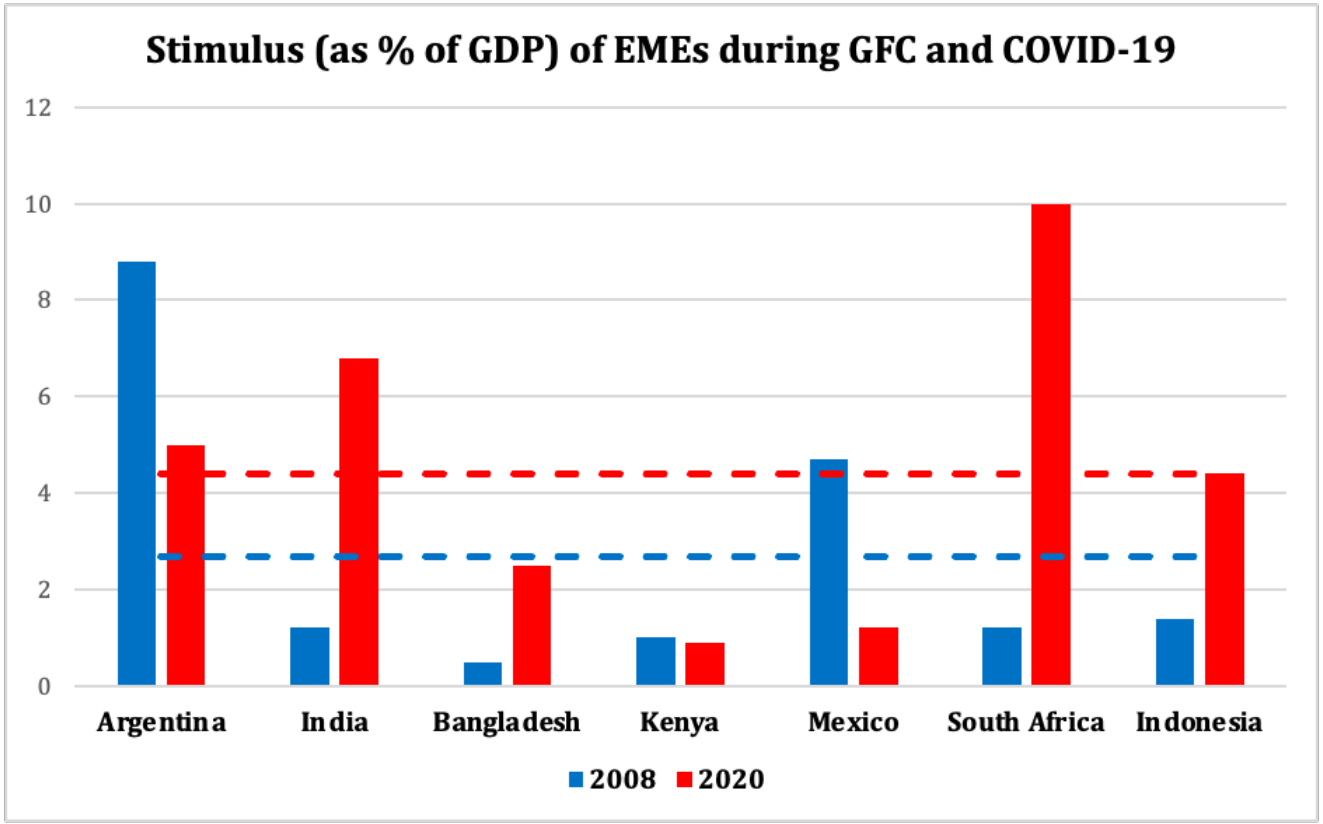

Figure: Stimulus (Source: UNCTAD)

Data

- All variables except CRAR were considered from (Guo and Stepanyan, 2011)

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- Gap periods were considered 2008Q4 for GFC and 2020Q2 for COVID-19.

Data

Description

Variables	Description	Sources
Private Credit	Claims in the private sector	IFS
Domestic deposit	Transfer/demand deposits	IFS
Non-resident liabilities	Foreign liabilities	IFS
Gross domestic product	GDP, constant prices (in US$)	IFS
Inflation	Consumer prices	WEO
Deposit rate	Deposit rate	IFS
Federal funds rate	Effective federal funds rate	US Federal reserve
Capital-to-risk (weighted) average ratio	Stability of financial system	GFSR

Figure: Variables, description and sources

Data

Variables

Formula

$$crg = \beta_0 + \beta_1 sd + \beta_2 sf + \beta_3 gdp + \beta_4 inf + \beta_5 dr + \beta_6 ff2 + \beta_7 crar + \epsilon$$

Abbreviators	Formula	Variables
crg	$Credit\ Growth_{i,t}$	Private Credit
sd	$Share\ of\ domestic\ deposits_{i,t-4} \times Domestic\ deposit\ growth_{i,t}$	Domestic deposit
sf	$Share\ of\ non-resident\ liabilities_{i,t-4} \times Non-resident\ liability\ growth_{i,t}$	Non-resident liabilities
gdp	$Gross\ domestic\ product_{i,t-1}$	Gross domestic product
inf	$Inflation\ rate_{i,t}$	Inflation
dr	$Deposit\ rate_{i,t}$	Deposit rate
ff2	$Fed\ Fund\ rate\ change_{i,t}$	Federal funds rate
crar	$CRAR\ rate_{i,t}$	Capital-to-risk (weighted) average ratio

Empirical estimation results

Scatterplot

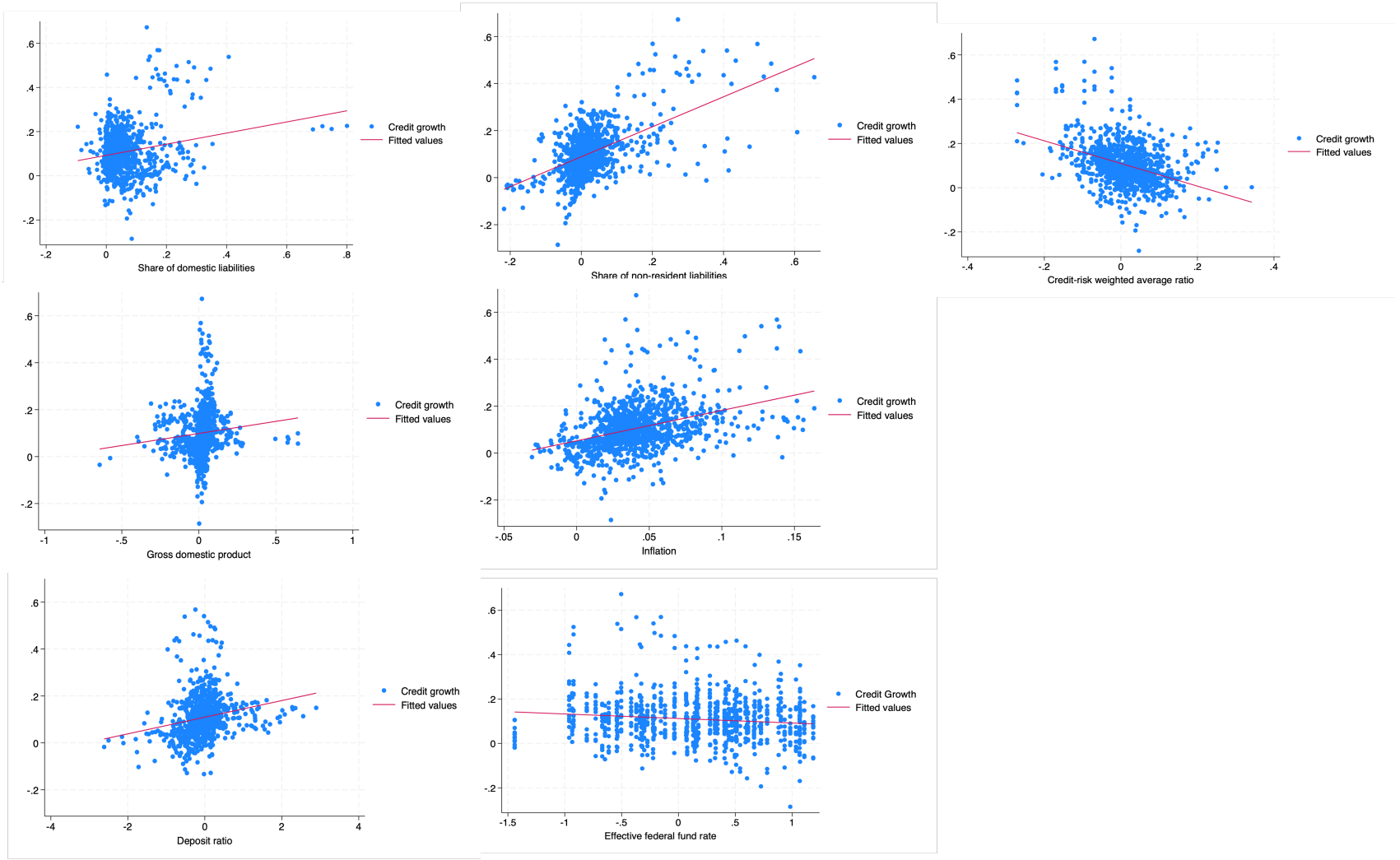

Figure: Scatterplot

Empirical estimation results

Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) crg	1.000							
(2) sf	0.594*	1.000						
	(0.000)							
(3) sd	0.244*	0.270*	1.000					
	(0.000)	(0.000)						
(4) gdp	0.102*	0.012	-0.117*	1.000				
	(0.005)	(0.735)	(0.001)					
(5) inf	0.388*	0.273*	-0.006	0.063	1.000			
	(0.000)	(0.000)	(0.864)	(0.084)				
(6) dr	0.177*	0.068	-0.140*	0.111*	0.299*	1.000		
	(0.000)	(0.061)	(0.000)	(0.005)	(0.000)			
(7) ff2	-0.117*	-0.106*	-0.002	0.068	-0.159*	0.066	1.000	
	(0.000)	(0.001)	(0.959)	(0.064)	(0.000)	(0.067)		
(8) crar	-0.394*	-0.318*	-0.156*	-0.061	-0.108*	-0.063	0.074*	1.000
	(0.000)	(0.000)	(0.000)	(0.097)	(0.001)	(0.087)	(0.029)	

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Figure: Correlation matrix

Empirical estimation results

Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
crg	897	.109	.104	-.285	.672
sf	889	.024	.084	-.217	.655
sd	889	.054	.077	-.056	.8
gdp	748	.015	.098	-.576	.644
inf	897	.041	.027	-.031	.164
dr	761	-.041	.442	-2.615	2.556
ff2	897	.156	.596	-1.44	1.186
crar	880	.008	.072	-.271	.342

Figure: Summary statistics

Hausman (1978) specification test

	Coef.
Chi-square test value	5.603
P-value	.587

Figure: Hausman specification test

Empirical estimation results

Regression results

crg	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
sf	.438	.033	13.25	0	.373	.502	***
sd	.273	.034	7.92	0	.205	.34	***
gdp	.105	.026	4.06	0	.054	.156	***
inf	.751	.142	5.30	0	.473	1.029	***
dr	.022	.006	3.82	0	.011	.034	***
ff2	-.002	.004	-0.49	.625	-.01	.006	
crar	-.222	.038	-5.85	0	-.297	-.148	***
Constant	.051	.011	4.86	0	.03	.072	***

Mean dependent var	0.104	SD dependent var	0.089
Overall r-squared	0.475	Number of obs	624
Chi-square	676.338	Prob > chi2	0.000
R-squared within	0.527	R-squared between	0.156

*** p<.01, ** p<.05, * p<.1

Figure: Regression results

Empirical estimation results

Breusch and Pagan Lagrange multiplier test

```
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        crg[ccode,t] = Xb + u[ccode] + e[ccode,t]

        Estimated results:
                         |       Var     SD = sqrt(Var)
                ---------+------------------------------
                     crg |   .0079236       .0890144
                       e |   .0033954       .0582701
                       u |   .0009264       .0304372

        Test: Var(u) = 0
                                 chibar2(01) =   486.93
                              Prob > chibar2 =   0.0000
```

Figure: BP Lagrange multiplier test

Empirical estimation results

Indicators of the dependent variables

Full GFC	
crg	
sf	0.425***
	(11.19)
sd	0.322***
	(7.61)
gdp	0.141***
	(3.58)
inf	0.882***
	(4.82)
dr	0.0288***
	(3.39)
ff2	0.0144**
	(2.57)
crar	-0.157***
	(-3.21)
_cons	0.0547***
	(4.43)
N	398
t statistics in parentheses	
* p<0.1, ** p<0.05, *** p<0.01	

Pre GFC	
crg	
sf	0.393***
	(5.23)
sd	0.309**
	(2.24)
gdp	0.262
	(0.78)
inf	1.157***
	(3.59)
dr	0.00888
	(0.40)
ff2	0.00569
	(0.43)
crar	0.0334
	(0.41)
_cons	0.0766***
	(3.49)
N	124
t statistics in parentheses	
* p<0.1, ** p<0.05, *** p<0.01	

Post GFC	
crg	
sf	0.139***
	(3.76)
sd	0.129***
	(4.22)
gdp	0.0307
	(1.18)
inf	0.0883
	(0.53)
dr	0.0248***
	(4.11)
ff2	0.00132
	(0.31)
crar	-0.253***
	(-5.72)
_cons	0.0820***
	(7.00)
N	274
t statistics in parentheses	
* p<0.1, ** p<0.05, *** p<0.01	

Empirical estimation results

Indicators of the dependent variables

Full COVID-19 crg	
sf	0.158*
	(1.78)
sd	0.146**
	(2.22)
gdp	0.0146
	(0.55)
inf	0.0340
	(0.22)
dr	0.0409***
	(7.02)
ff2	-0.00295
	(-0.62)
crar	-0.193***
	(-4.69)
_cons	0.0700***
	(7.20)
N	226

t statistics in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Pre COVID-19 crg	
sf	0.516***
	(4.89)
sd	0.156**
	(2.09)
gdp	-0.0640**
	(-2.45)
inf	-0.0202
	(-0.13)
dr	0.0448***
	(6.48)
ff2	-0.00737
	(-1.60)
crar	-0.0750
	(-1.55)
_cons	0.0751***
	(7.47)
N	186

t statistics in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Post COVID-19 crg	
sf	-0.348***
	(-3.23)
sd	0.424***
	(3.41)
gdp	0.101**
	(2.49)
inf	-0.0279
	(-0.08)
dr	0.0577***
	(7.10)
ff2	-0.0113
	(-0.82)
crar	-0.0511
	(-1.13)
_cons	0.0463
	(1.61)
N	40

t statistics in parentheses
* p<0.1, ** p<0.05, *** p<0.01

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- South and southeast Asia on the other hand, were the least impacted during 2008 Recession.
- Countries was better prepared for COVID-19 as CRAR was higher.
- Domestic deposits, foreign liabilities, economic growth, inflation, and the deposit rate contributed to credit **expansion**.
- Federal funds rate and capital-to-risk (weighted) asset ratio contributed **negatively**.

The End

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