The Global Economic Recovery 10 Years After the 2008 Financial Meltdown

CHAPTER 2 OF THE OCTOBER 2018 WEO

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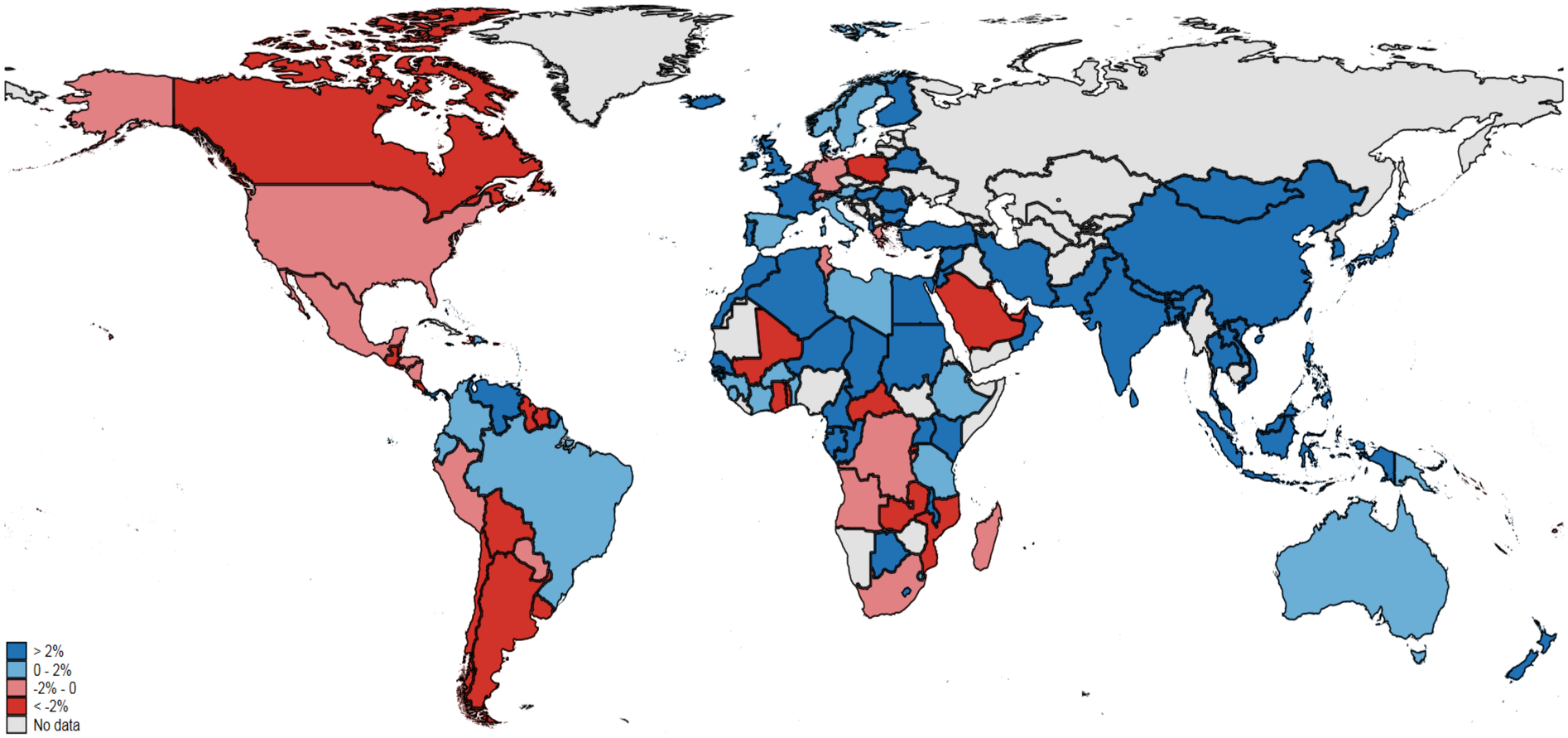
CONTEXT: A PREVIOUS "GLOBAL" DOWNTURN (1982)

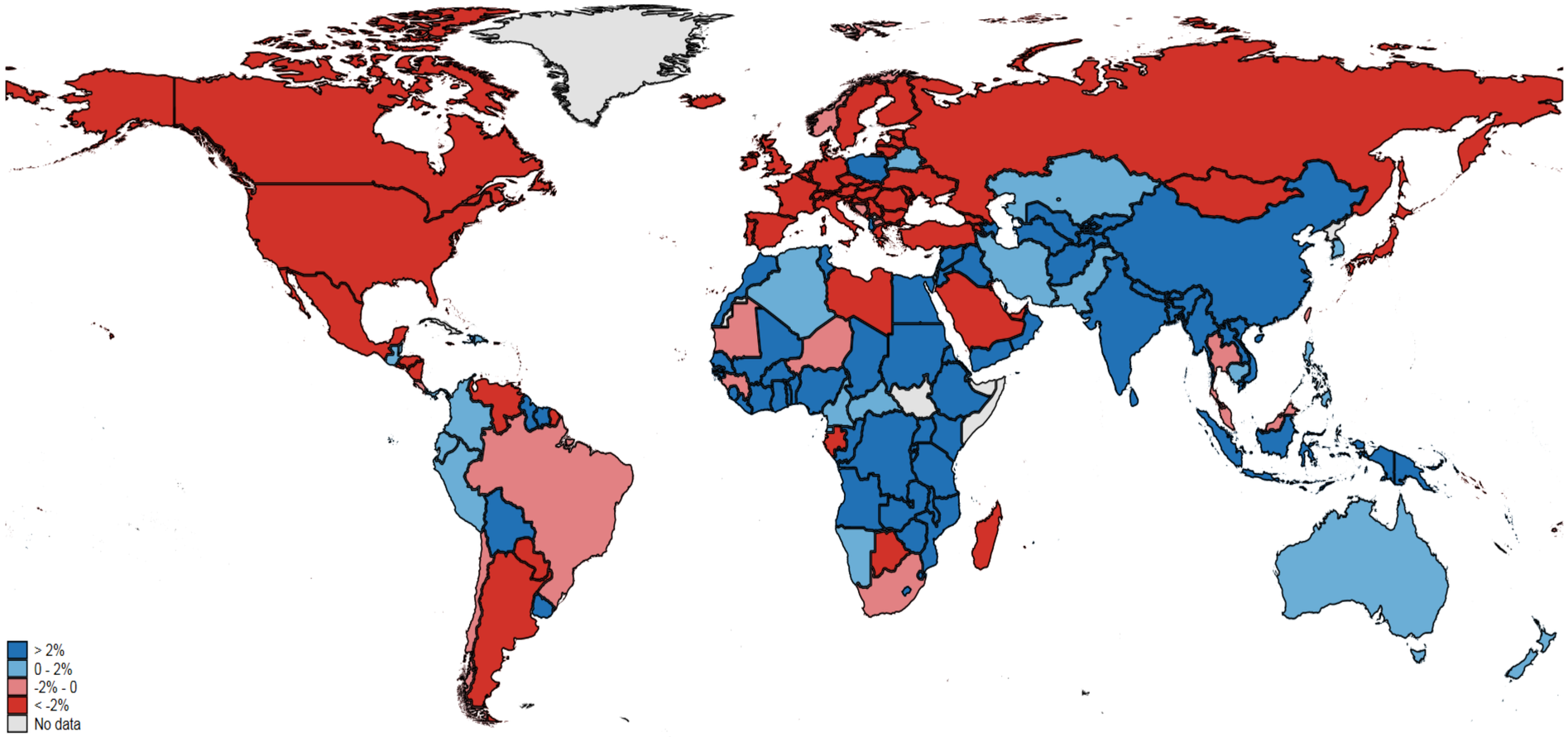
Forty-eight economies (46 percent of global GDP) experienced output declines



Source: *World Economic Outlook*

THE IMMEDIATE AFTERMATH OF THE 2008 MELTDOWN

Ninety-one economies (65 percent of global GDP) experienced output declines in 2009



Source: *World Economic Outlook*

MAIN QUESTIONS

Quantifying losses

- Compared to pre-crisis trends, how did output evolve across countries in the aftermath of the crisis?

Channels

- How did the associated components – capital, labor inputs, total factor productivity – advance after the crisis?

- Was technology adoption affected in the aftermath of the crisis?

Variation in post-crisis performance

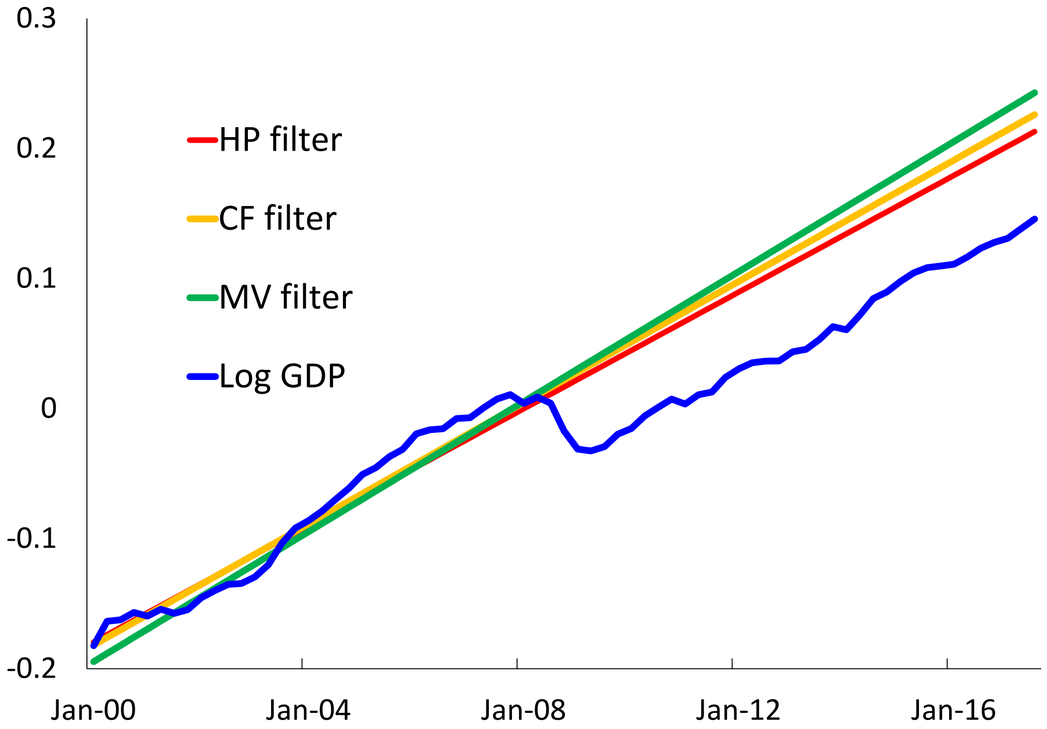
- What accounts for post-crisis variation in output losses across individual countries?

- What policies and structural attributes helped limit the damage and facilitate recovery?

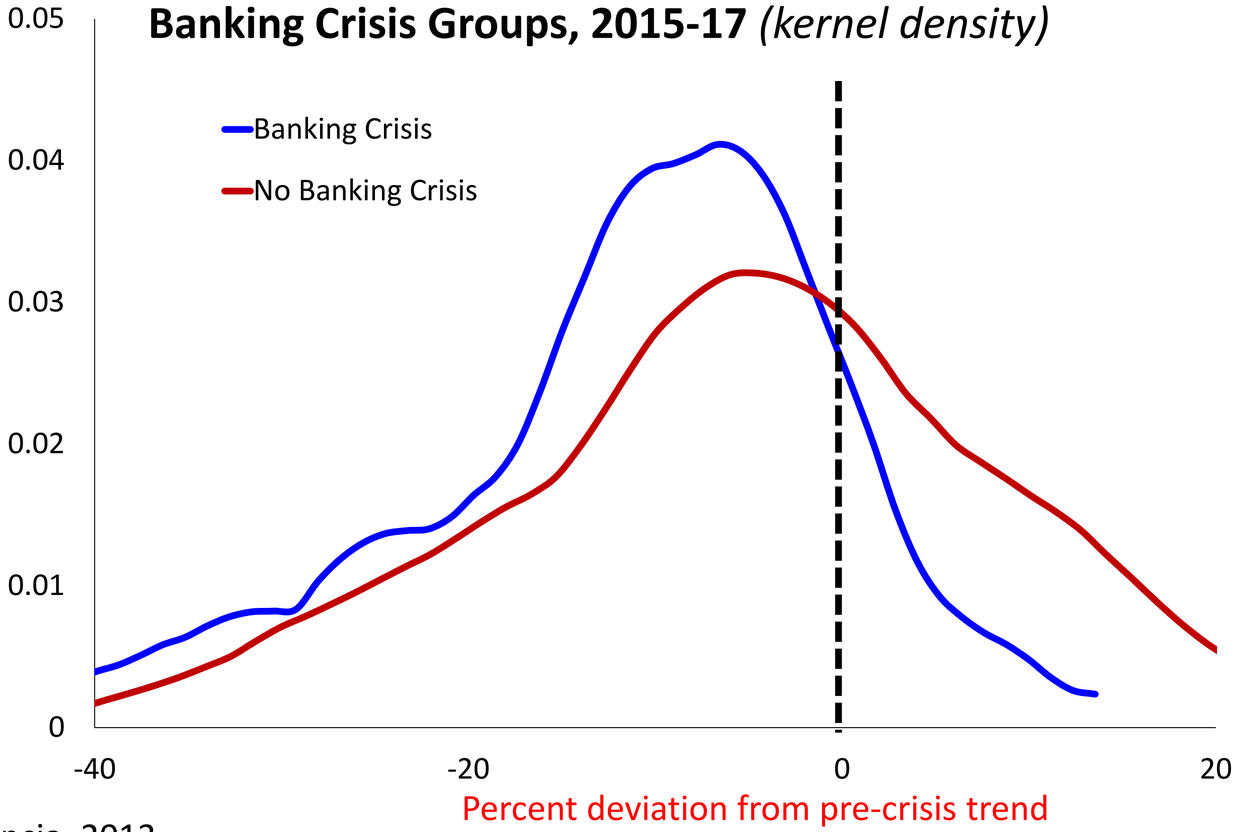
QUANTIFYING POST-CRISIS DEVIATIONS IN OUTPUT FROM PRE-CRISIS TRENDS

Losses appear permanent: output remains below pre-crisis trend in more than 60 percent of economies

Alternative Estimates of Pre-Crisis Trends for US
(2008 log GDP normalized to zero)



Post-Crisis Output Deviations from Pre-Crisis Trends by Banking Crisis Groups, 2015-17 *(kernel density)*



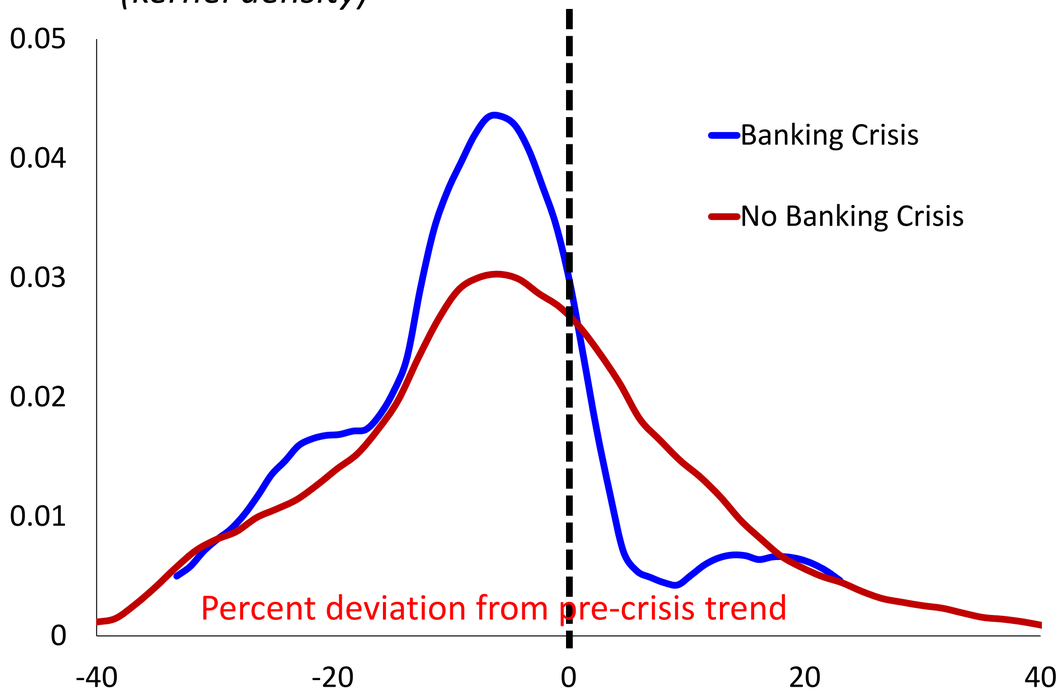
Sources: IMF staff calculations. Banking Crisis data: Laeven and Valencia, 2013.
Note: Trend log GDP denotes extrapolated trend of potential GDP during 2000-08. Potential GDP estimated with the HP filter, lambda=100. GDP deviations from the pre-GFC trend, 2015-17.

CHANGES IN LABOR INPUT CANNOT EXPLAIN OUTPUT LOSSES: SIMILAR PATTERN SEEN IN OUTPUT PER WORKER

Shortfall in other factor inputs could account for losses in labor productivity - sluggish investment

Post-Crisis Output per Worker Deviations from Pre-Crisis Trends, 2015-17

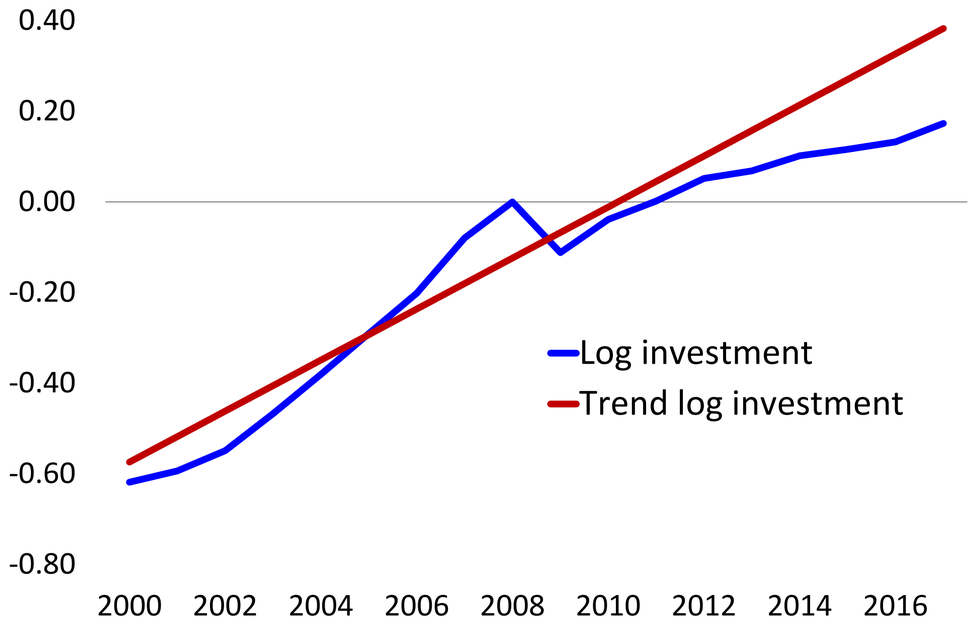
(kernel density)



Post-Crisis Investment Deviations from Pre-Crisis Trends

Mean Trajectory: Post-GFC Deviation from Real Investment Trend

(*2008 log investment normalized to zero*)

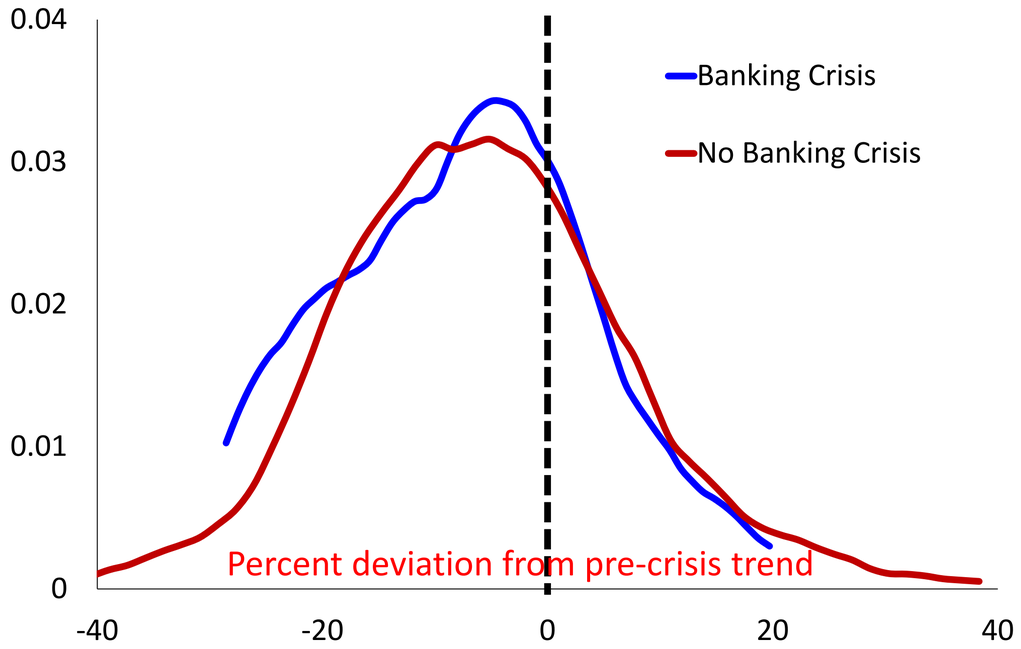


Sources: IMF staff calculations. Banking Crisis data: Laeven and Valencia, 2013.
Note: Distribution of average deviations, 2015-17.

IN MANY COUNTRIES, SLUGGISH INVESTMENT POSSIBLY CONTRIBUTED TO SLOW CAPITAL ACCUMULATION…

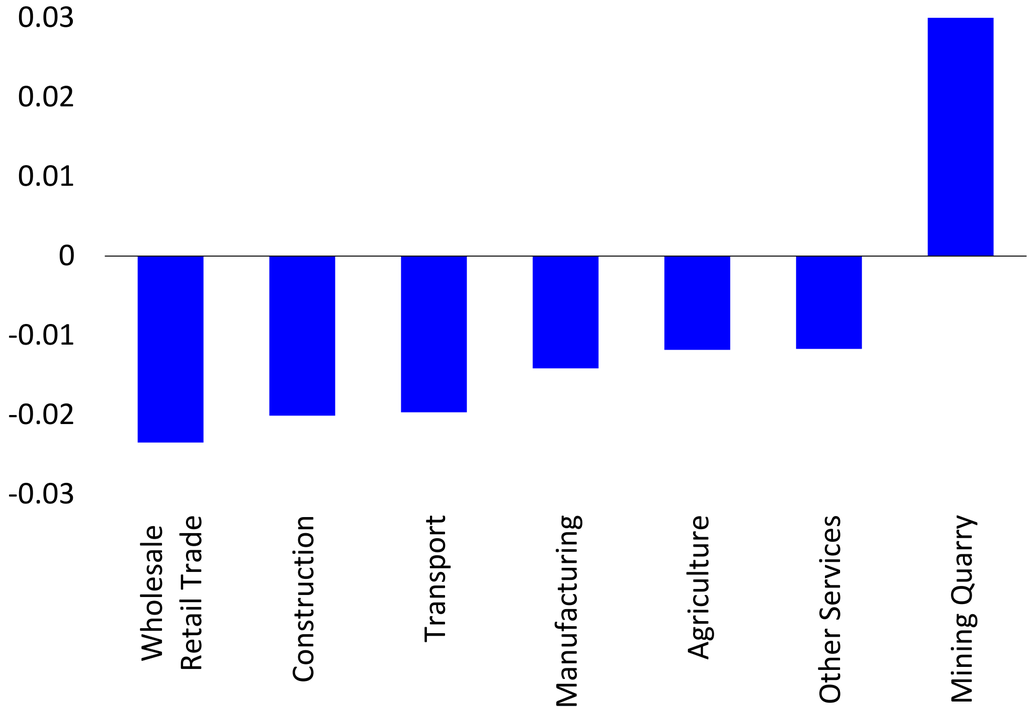
Capital stock shortfalls relative to pre-crisis trends: post-crisis deceleration in capital accumulation across AEs and major EMs not just in construction sector

Post-Crisis Capital Stock Deviations from Pre-Crisis Trends, 2015-17
(kernel density)



Sources: IMF staff calculations.
Note: Distribution of average deviations, 2015-17.

Change in post- and pre-crisis growth rates in capital stock by industry, 2011-14 minus 2000-07 averages *(percent)*

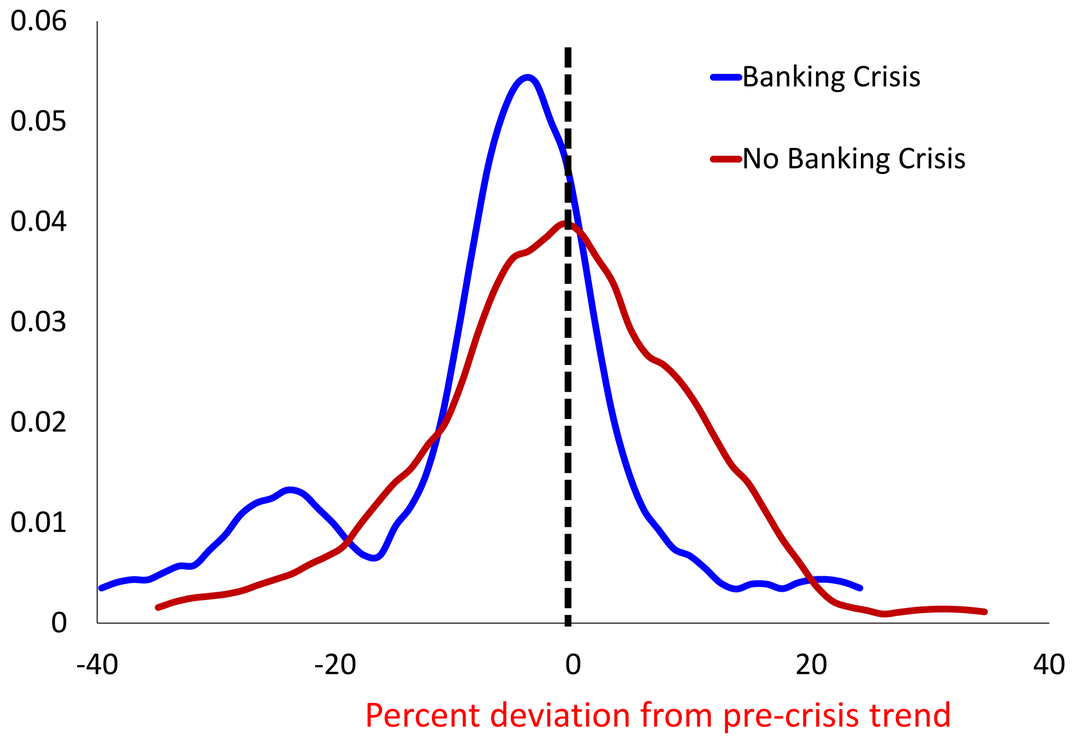


Sources: World Input-Output Database; and IMF staff calculations.

… AND SLOW TECH ADOPTION

TFP shortfalls relative to pre-crisis trends

Post-Crisis TFP Deviations from Pre-Crisis Trends, 2015-17
(kernel density)



Sources: IMF staff calculations.
Note: Distribution of average deviations, 2015-17.

GROWTH ACCOUNTING SUGGESTS TFP DEVIATIONS ACCOUNT FOR LARGE SHARE OF GDP PER WORKER DEVIATIONS

$$\frac{y^{actual}}{y^{pre-GFC\ trend}} = \frac{A^{actual}}{A^{pre-GFC\ trend}} * \left(\frac{k^{actual}}{k^{pre-GFC\ trend}}\right)^{\propto}$$

GDP per worker deviations account for a large share of GDP deviations across all country groups

Median share of GDP deviation accounted for by deviation in GDP per worker, 2015-17 (percent)	
Countries without banking crisis	70.4
Banking crisis countries	80.5

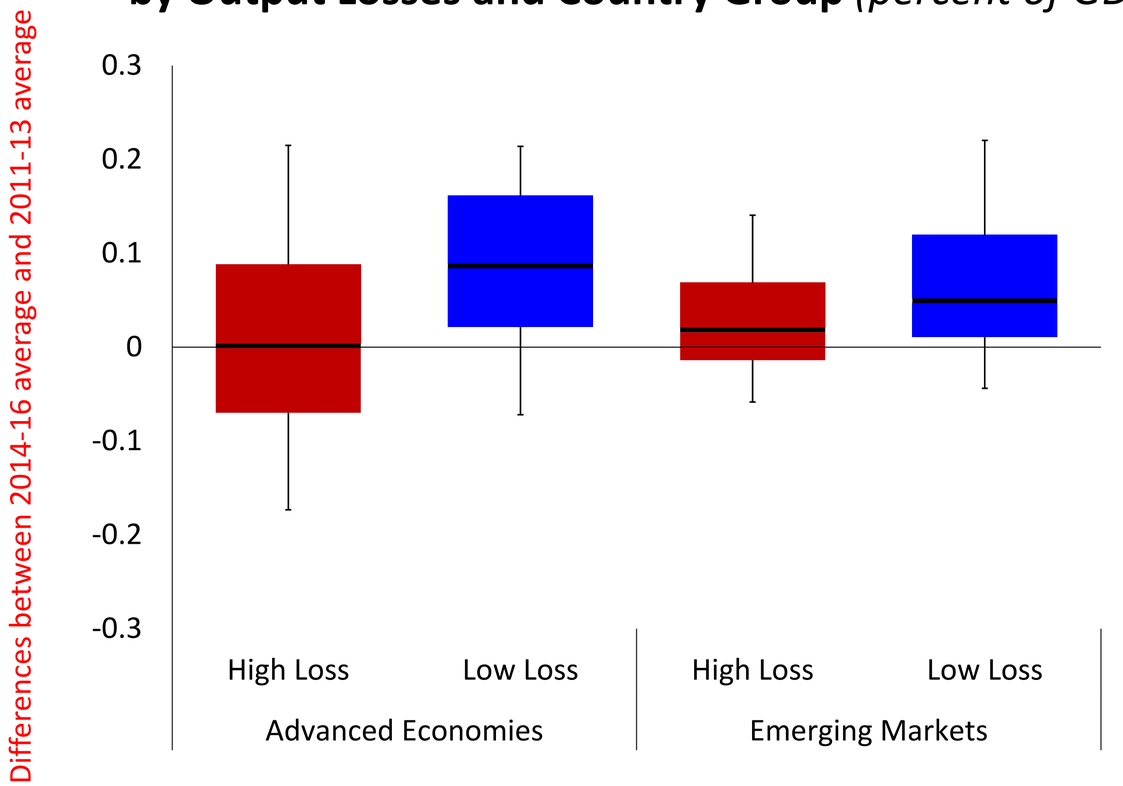
TFP deviations account for a large share of GDP per worker deviations

Median share of GDP per worker Deviation accounted for by TFP, 2015-17 (percent)	
Countries without banking crisis	79.3
Banking crisis countries	78.2

DRILLING DEEPER INTO TFP: HIGHER POST-CRISIS LOSSES ASSOCIATED WITH SLOWER INCREASES IN R&D EXPENDITURE…

Countries with higher post-crisis losses – especially AEs - registered slower increases in R&D shares

Changes in Research and Development Expenditure by Output Losses and Country Group *(percent of GDP)*

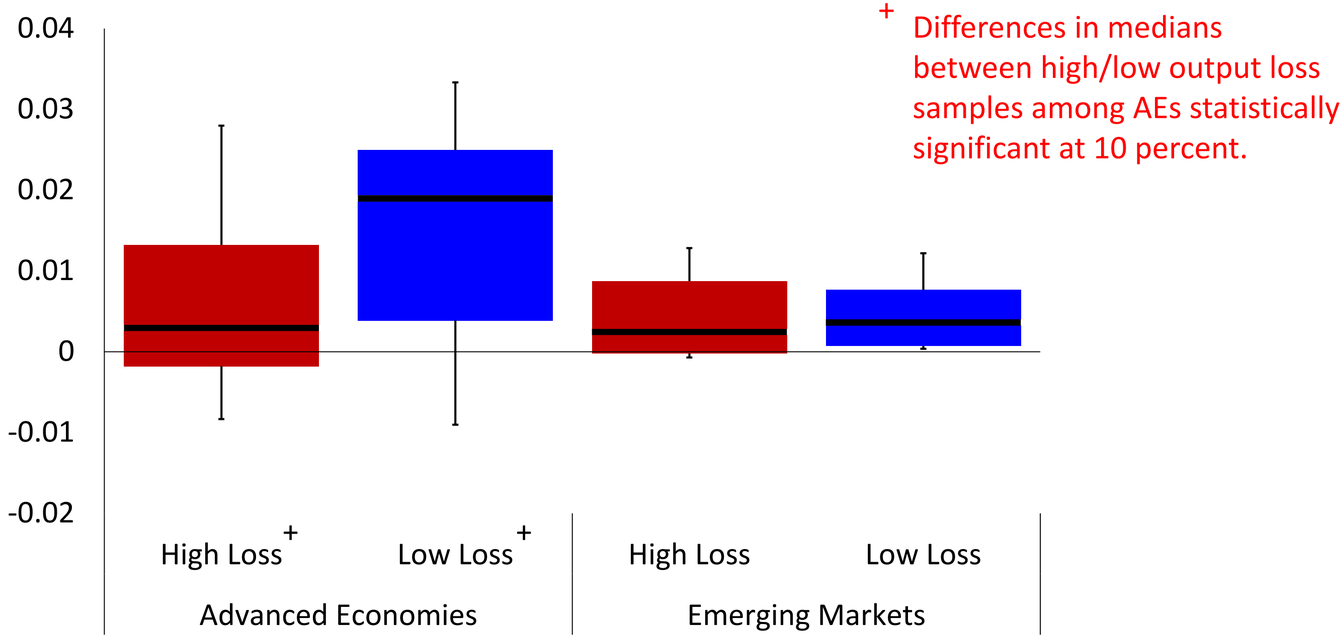


Sources: WDI, IMF staff calculations.
Note: The bars depict the differences between 2014-16 average and 2011-13 average. Bar chart shows interquartile range (IQR) and lines display lesser of maximum (minimum) and +/- 1.5 times upper (lower) quartile range.

…AND WITH SLOWER TECH ADOPTION

Robot diffusion appears slower in countries with higher post-crisis output losses

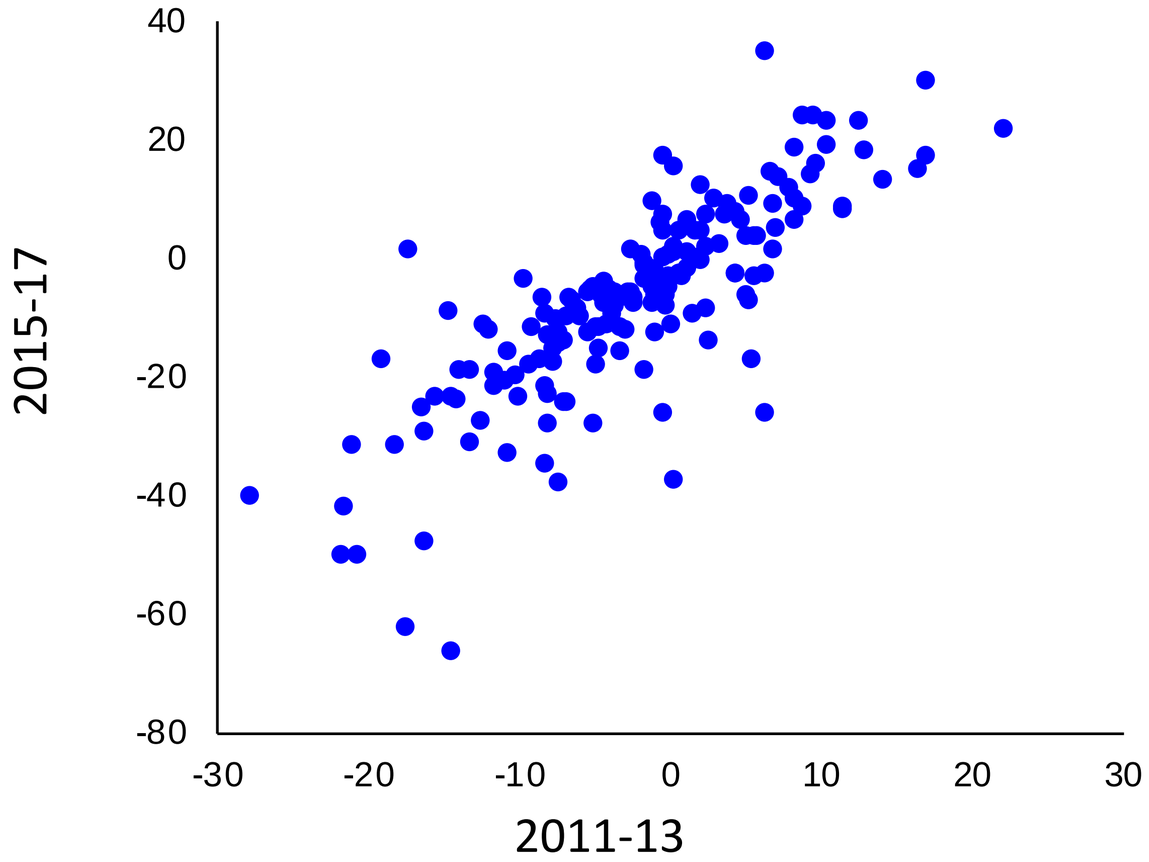
Average Change in Robot Density by Output Loss and Country Group, 2010-14



Sources: International Federation of Robotics; World Input-Output Database; and IMF staff calculations.
Note: Robot density defined as robot flow / thousand hours worked. LHS bar chart shows interquartile range (IQR) and lines display lesser of maximum (minimum) and +/- 1.5 times upper (lower) quartile range.

CROSS-COUNTRY VARIATION IN POST-CRISIS PERFORMANCE: DEVIATIONS ARE PERSISTENT

Correlation of GDP Deviations Between Periods



Source: IMF staff calculations.

- Deviations are persistent over time
- The correlations between GDP deviations for 2011-13 and 2015-17 are around 0.90 (0.84 for the Spearman rank correlation).

CORRELATES OF CROSS-COUNTRY VARIATION IN POST-CRISIS PERFORMANCE

- *Building on WEO 2009; Lane and Milesi-Ferretti 2010, 2014; Claessens, Dell'Ariccia, Igan, and Laeven 2010; Gourinchas and Obstfeld 2012; Cerra, Panizza, and Saxena 2013…*

$$\Delta y_i = \alpha + \boldsymbol{\beta} * \boldsymbol{controls}_i + \varepsilon_i$$

- OLS specification; 120 economies
- Δy_i : output deviations 2011-13 and 2015-17
- $\boldsymbol{controls}$: initial conditions averaged over 2005-2008
  - Macrofinancial vulnerabilities
  - Flexibility to adjust and economic structure
  - Initial policy space
  - Banking crisis
- Post-Crisis Policy Actions 2008-2009
  - Capital Injection
  - Guarantees
  - Total stimulus

CORRELATES OF CROSS-COUNTRY VARIATION IN POST-CRISIS PERFORMANCE

Table 2.2. Impact of Precrisis Conditions on 2011–13 GDP Deviations from Precrisis Trend

	(1)	(2)	(3)	(4)	(5)	(6)
	All Countries		AEs		EMs	
Domestic Credit Growth	– **	– ***	– ***	– ***	– ***	– **
Demand Exposure to Advanced Economies	– ***	–	+	+	–	–
Demand Exposure to China	+	+	+	+ *	+ **	+
Financial Openness	– *	–	–	–	–	–
CA Balance	+		+ ***		–	
CA Gap		+ ***		+ ***		+
Share of Manufacturing in GDP	+		+		+	
Difficulty of Dismissal	– **		– *		– **	
Precrisis GG Debt Change	– ***		– ***		– ***	
De Facto Peg Dummy	– **		– ***		–	
Banking Crisis	– **	–				

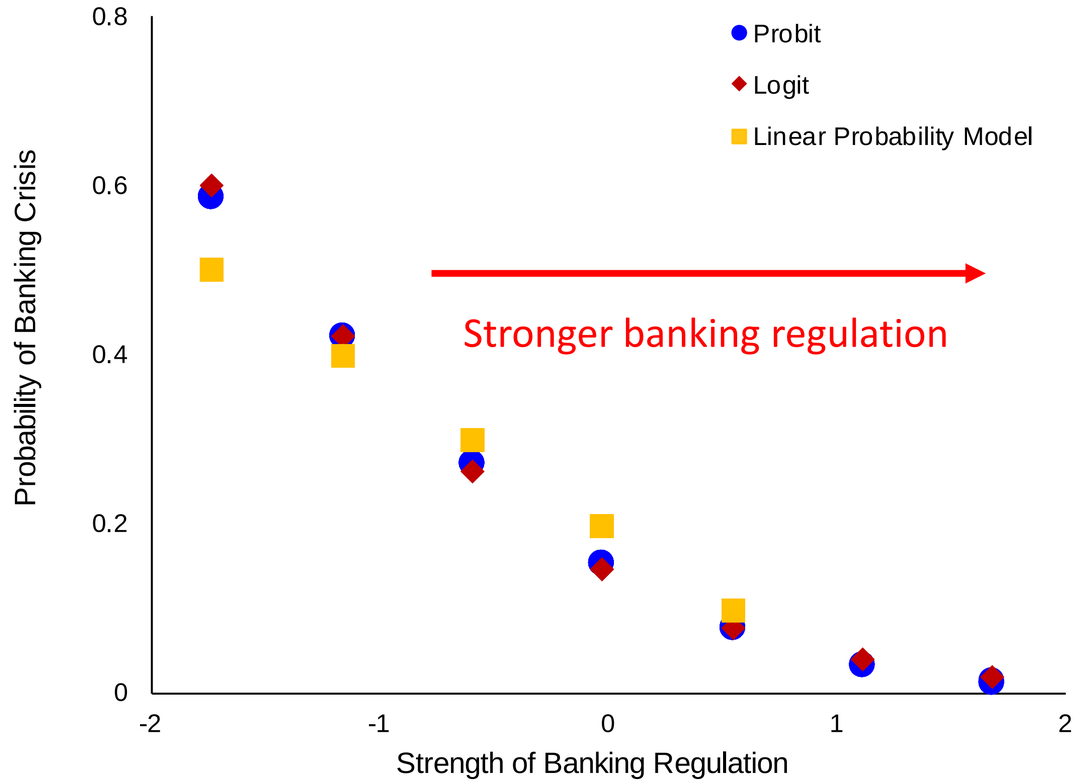
Source: IMF staff calculations.

Note: + denotes positive impact, – denotes negative impact. Precrisis conditions are averaged over 2005–08. Results in columns (1) and (2) are reported in Online Annex Table 2.2.5. Results in columns (3) through (6) are reported in Online Annex Table 2.2.7. AEs = advanced economies; CA = current account; CA Gap = excess external balance, Lee and others (2008); EMs = emerging markets; GG = general government.

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

STRONGER PRE-CRISIS BANKING REGULATION: LOWER PROBABILITY OF BANKING CRISIS

Probability of banking crisis in 2007-09 is lower in economies with stronger pre-crisis banking regulation

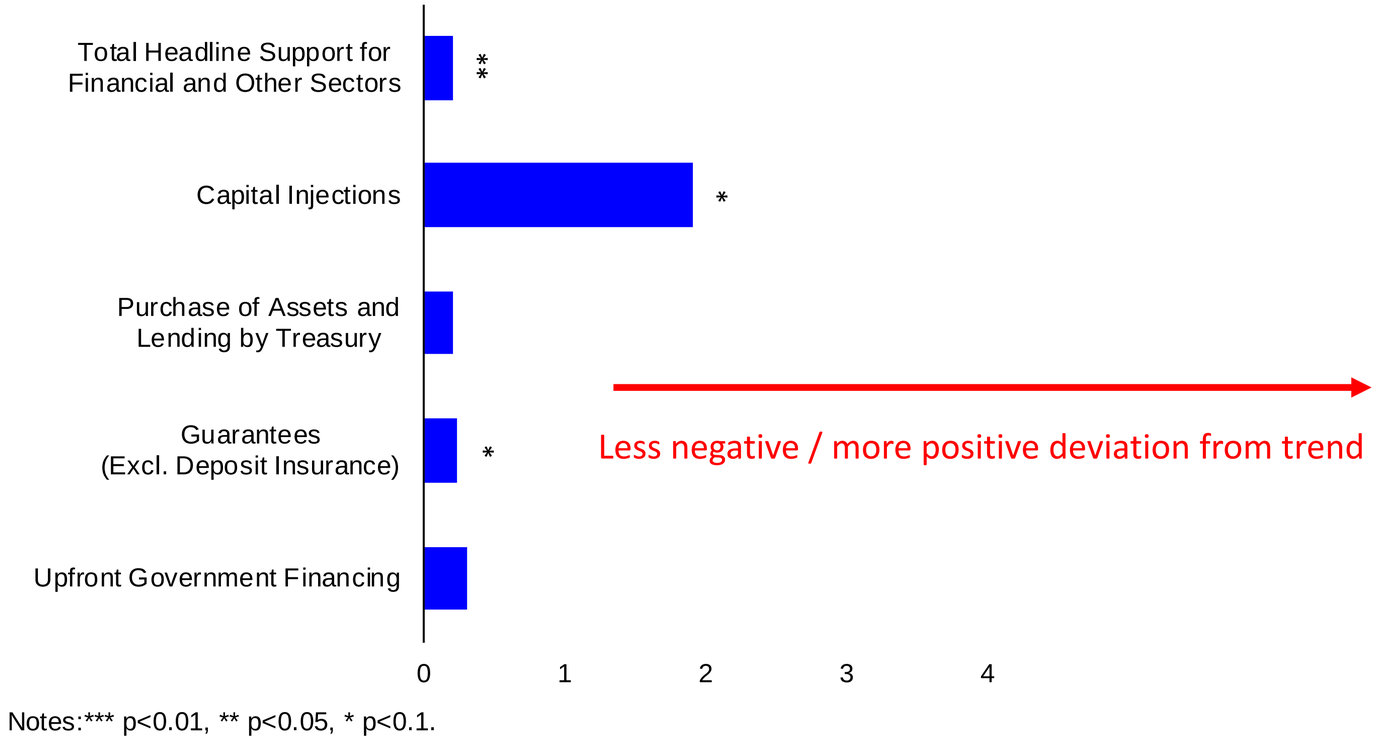


Banking Regulation Index: Barth, Caprio, Levine 2013

Source: IMF staff calculations.

CORRELATES OF POLICY INTERVENTIONS AND CROSS-COUNTRY VARIATION IN POST-CRISIS PERFORMANCE

Impact on 2015-17 GDP deviations from one standard deviation increase in drivers

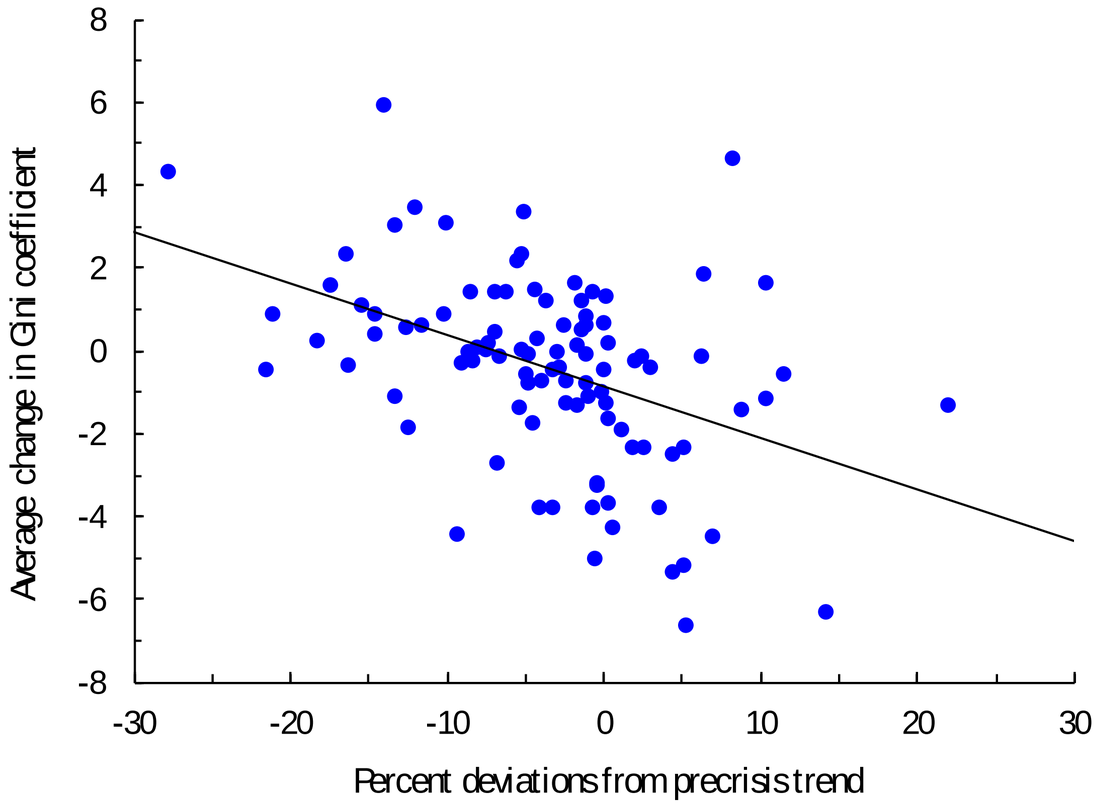


Percent deviation from pre-crisis trend

Source: IMF staff calculations.

INEQUALITY INCREASED MORE IN COUNTRIES THAT EXPERIENCED LARGER OUTPUT LOSSES

Change in Inequality (2014-15 relative to 2005-08) and Postcrisis Output Deviations (2011-13)

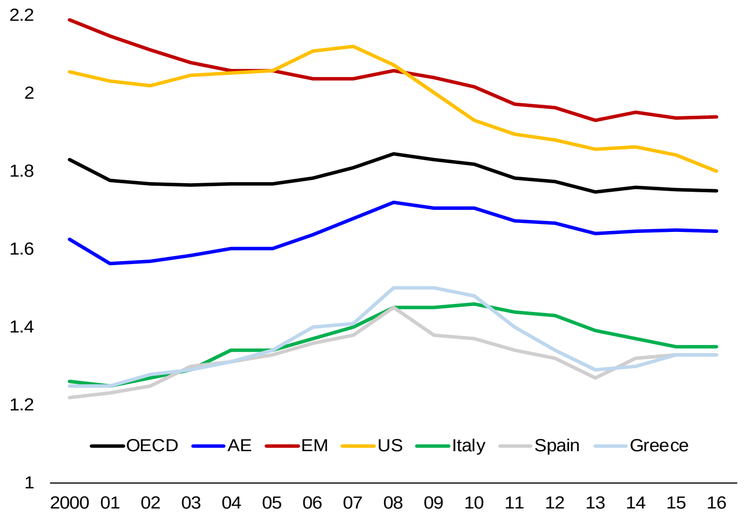


Sources: Standardized World Income Inequality Database (Solt 2016); and IMF staff calculations.

LOWER FERTILITY RATES IN SOME COUNTRIES, WITH IMPLICATIONS FOR FUTURE LABOR INPUT

Total Fertility Rate

(Number of births per woman)



Sources: Organisation for Economic Co-operation and Development (OECD); World Bank, World Development Indicators database; and IMF staff calculations. Note: OECD is the average fertility rate for OECD and partner countries. AEs = OECD and partner advanced economies; EMs = OECD and partner emerging market economies. See Online Annex 2.1 for country list.

CRISIS AFTERMATH: TAKEAWAYS

- Persistence of losses following the crisis – widespread, not just in countries with banking crisis
- Sluggish investment is a key channel – associated with long-lasting capital and TFP shortfalls
- R&D investment increased less and tech adoption appears slower in countries that suffered larger losses

POLICY IMPLICATIONS

MACROFINANCIAL AND EXTERNAL

- More rapid pre-crisis credit growth associated with larger post-crisis losses
- Stronger external balances associated with lower post-crisis losses
- Stricter banking regulation associated with lower probability of banking crisis

FISCAL, MONETARY, STRUCTURAL

- Fiscal buffers help reduce GDP damages
- Less rigid exchange rate regimes help lessen GDP damages
- Labor market rigidity can slow the pace of recovery; associated with larger displacement effects of automation

POST-CRISIS ACTIONS

- Capital injections mitigate post-crisis GDP loss
- Guarantees help lessen GDP damages