THE GLOBAL ECONOMIC RECOVERY 10 YEARS AFTER THE 2008 FINANCIAL MELTDOWN

CHAPTER 2 OF THE OCTOBER 2018 WEO

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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?
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)

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.
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)

Percent deviation from pre-crisis trend

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)

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

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

\[
\frac{y^{\text{actual}}}{y^{\text{pre-GFC trend}}} = \frac{A^{\text{actual}}}{A^{\text{pre-GFC trend}}} \times \left(\frac{k^{\text{actual}}}{k^{\text{pre-GFC trend}}}\right)^\alpha
\]

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

Source: IMF staff calculations.
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...

\[ \Delta y_i = \alpha + \beta * controls_i + \varepsilon_i \]

- OLS specification; 120 economies
- \( \Delta y_i \): output deviations 2011-13 and 2015-17
- \textit{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
### Table 2.2. Impact of Precrisis Conditions on 2011–13 GDP Deviations from Precrisis Trend

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<td>CA Balance</td>
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<td>Share of Manufacturing in GDP</td>
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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.
Probability of banking crisis in 2007-09 is lower in economies with stronger pre-crisis banking regulation.
Impact on 2015-17 GDP deviations from one standard deviation increase in drivers

- **Total Headline Support for Financial and Other Sectors**
  - Percent deviation from pre-crisis trend

- **Capital Injections**
  - Percent deviation from trend

- **Purchase of Assets and Lending by Treasury**
  - Percent deviation from trend

- **Guarantees (Excl. Deposit Insurance)**
  - Percent deviation from trend

- **Upfront Government Financing**
  - Percent deviation from trend

Notes:*** p<0.01, ** p<0.05, * p<0.1.

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.
• 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