Fiscal Crises

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This presentation is based on an IMF working paper WP/17/86 authored by Kerstin Gerling, Paulo Medas, Tigran Poghosyan, Juan Farah-Yacoub, and Yizhi Xu. The views are those of the authors and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.
Motivation

Ten of the Worst Crises Since 2005
(decline in the real GDPpc growth rate, percentage points)

Source: Authors' own calculations, based on IMF data.
Note: difference in simple averages of real GDPpc growth rate of the three years preceding a crisis and the three years after the onset of the crisis.
Motivation

- Sound fiscal policy seen as key ingredient for stability and sustainable growth ...

- ... but empirical identification of fiscal crises is scarce

- Previous literature
  - Focuses mainly on public debt defaults (*legal* definition) ...
  - ... mostly external ...
  - ... mostly in advanced and emerging economies
  - Baldacci et al. (2011) is an exception (*economic* criteria)
    - Also adopted by the EC recently (Sumner & Berti 2017)

- Our contribution
  - Wider country and time coverage (all 188 IMF members, 1970-2015)
  - Improved identification methodology
  - Event study analysis – dynamics of macroeconomic variables around fiscal crises

Existing databases
- Reinhart & Rogoff (2011): 75 external and 26 domestic defaults
- Baldacci et al. (2011): 176 fiscal crises
- Laeven & Valencia (2012): 67 debt defaults
- Bruns & Poghosyan (2016): 201 fiscal crises
- Sumner & Berti (2017): 88 fiscal crises

Our database
436 fiscal crises in total, of which:
- 25 in Advanced Markets (AM)
- 154 in Emerging Markets (EM)
- 171 in Low-Income and Developing Countries (LIDC)
- 86 in Small Developing States (SDS)
Outline

I. New Database on Fiscal Crises

II. Empirical Analysis

III. Concluding remarks
I. New Database on Fiscal Crises
## Red Flags: How To Identify Fiscal Crises?

<table>
<thead>
<tr>
<th>Red Flag Category</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Credit event</td>
<td>Any year in which actions of the sovereign reduce the PV of public debt</td>
<td>Bulgaria 1990; Macedonia 2010</td>
</tr>
<tr>
<td></td>
<td>Exclude technical defaults</td>
<td></td>
</tr>
<tr>
<td>2. Official financing</td>
<td>Any year under a large IMF financial arrangement ...</td>
<td>Hungary 2008; Ireland 2010</td>
</tr>
<tr>
<td></td>
<td>... with fiscal adjustment as a program objective</td>
<td></td>
</tr>
<tr>
<td>3. Implicit default</td>
<td>Any year with a very high inflation</td>
<td>Belarus 1999; Russia 2007</td>
</tr>
<tr>
<td></td>
<td>Any year with domestic arrears accumulation (new!)</td>
<td></td>
</tr>
<tr>
<td>4. Market confidence</td>
<td>Any year with a very high price of market access</td>
<td>Ukraine 2008; Romania 2009</td>
</tr>
<tr>
<td></td>
<td>Any year with loss of market access (new!)</td>
<td></td>
</tr>
<tr>
<td>Criterion</td>
<td>Main Sources</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td><strong>(1) Credit event</strong></td>
<td></td>
<td>• BoC (2016)</td>
</tr>
<tr>
<td>Any operation that makes creditors incur material economic losses on the sovereign debt they hold (e.g. default, restructuring, or rescheduling)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) of substantial size (in percent of GDP p.a.)</td>
<td>AMs</td>
<td>≥ 0.2</td>
</tr>
<tr>
<td>(ii) if (i) holds and the defaulted nominal amount grows by a substantial amount (in percent p.a)</td>
<td>EMs</td>
<td>≥ 10</td>
</tr>
<tr>
<td><strong>(2) Exceptionally large official financing</strong></td>
<td></td>
<td>• IMF</td>
</tr>
<tr>
<td>High-access IMF financial arrangement with fiscal adjustment objective in place (in percent of quota)</td>
<td>LIDCs</td>
<td>≥ 100</td>
</tr>
<tr>
<td><strong>(3) Implicit domestic public default</strong></td>
<td></td>
<td>• OECD and Eurostat</td>
</tr>
<tr>
<td>(a) High inflation rate (in percent of growth of annual average CPI p.a.)</td>
<td>AMs</td>
<td>≥ 35</td>
</tr>
<tr>
<td>(b) Steep increase in domestic arrears (in first difference of the ratio of 'other account payables (OAP)' to GDP in percentage points)</td>
<td>EMs</td>
<td>≥ 100</td>
</tr>
<tr>
<td></td>
<td>LIDCs</td>
<td>≥ 35</td>
</tr>
<tr>
<td></td>
<td>SDSs</td>
<td>≥ 1</td>
</tr>
<tr>
<td>(a) Loss of market access</td>
<td>when market access is lost (after maintaining market access for a 1/4 of the sample time and 2 consecutive years before the loss year)</td>
<td></td>
</tr>
<tr>
<td>(b) High price of market access (in basis points, sovereign spreads or CDS spreads)</td>
<td>AMs</td>
<td>≥ 1,000 bps</td>
</tr>
<tr>
<td></td>
<td>EMs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LIDCs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SDSs</td>
<td></td>
</tr>
</tbody>
</table>

Note: AM = advanced markets, EM = emerging markets, LIDC = low-income and developing countries, SDS = small developing states.
Fiscal Crisis Episodes (1970-2015)

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>AM</th>
<th>EM</th>
<th>LIDC</th>
<th>SDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>With start date within sample period</td>
<td>436</td>
<td>25</td>
<td>154</td>
<td>171</td>
<td>86</td>
</tr>
<tr>
<td>Average per country</td>
<td>2.3</td>
<td>0.7</td>
<td>2.2</td>
<td>3.4</td>
<td>2.6</td>
</tr>
<tr>
<td>With start and end date within sample period</td>
<td>400</td>
<td>23</td>
<td>143</td>
<td>154</td>
<td>80</td>
</tr>
<tr>
<td>Average number of crises per country</td>
<td>2.1</td>
<td>0.7</td>
<td>2.0</td>
<td>3.1</td>
<td>2.4</td>
</tr>
<tr>
<td>Average probability of starting a crisis</td>
<td>6.7%</td>
<td>1.6%</td>
<td>6.4%</td>
<td>13.0%</td>
<td>6.7%</td>
</tr>
<tr>
<td>Average probability of being in a crisis</td>
<td>29.3%</td>
<td>6.0%</td>
<td>29.9%</td>
<td>50.4%</td>
<td>20.6%</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations.

AM = advanced markets, EM = emerging markets, LIDC = low-income and developing countries, SDS = small developing states.
Dynamics of Fiscal Crises

By Country Groups

By Criteria

Advanced
Emerging
Low Income
Small Developing States
Credit event
Exceptional financing
Implicit default
Market confidence
Overlap between Fiscal, Banking, and Currency Crises

Source: Laeven and Valencia (2012), authors’ calculations.
II. Empirical Analysis
Event Study

- Empirical regularities during the 11-year time window around fiscal crises (Gourinchas & Obstfeld 2012; Catao & Milesi-Ferretti 2014)
- Does not necessarily imply causality

\[ y_{it} = \alpha_i + \sum_{j=-5}^{5} \beta_j F_{t+j} + \epsilon_{it} \]

where:
\( y \) = variable of interest (e.g., real GDP p.c. growth, public debt-to-GDP ratio)
\( F \) = dummy variables taking the value of 1 in period \( t+j \), where \( t \) is the fiscal crisis year
\( \beta \) = conditional effect of a crisis over the event window relative to tranquil times
What Happens Around Fiscal Crises?

Note: Reported are coefficient estimates with 95% confidence intervals.
Fiscal Crises and Growth: By Country Groups

Note: Reported are coefficient estimates with 95% confidence intervals.
AM = advanced markets, EM = emerging markets, LIDC = low-income and developing countries, SDS = small developing states.
Recessions are common at time of Crisis

Negative growth around fiscal crises
(percentage of countries with negative GDPpc real growth)

Source: Authors’ calculations.
Fiscal Crises and Growth: By Criteria

1. Credit event

2. Official financing

3. Implicit default

4. Market confidence

Note: Reported are coefficient estimates with 95% confidence intervals.
Event Study – Twin Crises

Empirical specification:

\[ y_{it} = \alpha_i + \sum_{j=-5}^{5} \beta_j F_{t+j} + \sum_{j=-5}^{5} \gamma_j F_{Bt+j} + \sum_{j=-5}^{5} \delta_j F_{Ct+j} + \epsilon_{it} \]

where:

- \( y \) = macro variable of interest (e.g., growth, public debt ratio)
- \( F \) = fiscal crisis dummy
- \( FB \) = twin fiscal-banking crisis dummy
- \( FC \) = twin fiscal-currency crisis dummy
- \( \beta \) = effect of a fiscal crisis
- \( \gamma \) = additional effect of a twin fiscal-banking crisis
- \( \delta \) = additional effect of a twin fiscal-currency crisis
Twin Fiscal-Currency Crises

Note: Reported are coefficient estimates with 95% confidence intervals.
III. Concluding Remarks
Conclusions

- A new IMF database on fiscal crises
  - Updated annually
  - Large sample (including LIDCs, over 4½ decades) ...
  - ... but some challenges remain (variability of quality/available data across criteria, time, and country groups)

- Helps understanding implications of fiscal crises
  - Crises are disruptive: economic recession, indebtedness rises ...
  - ... but effects can vary across country groups and crisis criteria
  - Procyclical fiscal policy (expenditures) play a role
  - Twin crises can be even more disruptive

- Can be used to conduct further research
Predicting Fiscal Crises - Preliminary

- **Signaling and Logit approaches**

- **Advanced and Emerging Economies**
  - Macro imbalances: external (current account), financial (credit growth), and economic activity (large output gap)
  - Strong expenditure growth increases probability of crisis - evidence of destabilizing role of procyclical fiscal policy
  - Able to predict a large share of crises (out of sample)

- **Low Income Countries**
  - Very different factors; able to predict large share of crises
  - External factors very relevant: world growth; food prices; dependence on external aid
  - Some role for domestic economic activity and traditional fiscal indicators
Thank you!
## Types of Fiscal Crises per Country Groups

<table>
<thead>
<tr>
<th></th>
<th>AM</th>
<th>EM</th>
<th>LIDC</th>
<th>SDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit event</td>
<td>0</td>
<td>85</td>
<td>141</td>
<td>71</td>
</tr>
<tr>
<td>Official financing</td>
<td>11</td>
<td>40</td>
<td>29</td>
<td>6</td>
</tr>
<tr>
<td>Implicit default</td>
<td>13</td>
<td>18</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Market confidence</td>
<td>7</td>
<td>25</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations.
Long-Term Impact?

**Specification:**

\[ y_{i,t} = \alpha_i + \sum_{j=1}^{p} \beta_j y_{i,t-j} + \sum_{s=0}^{q} \delta_s D_{i,t-s} + \varepsilon_{i,t} \]

<table>
<thead>
<tr>
<th>Public Debt</th>
<th>Real GDP p.c.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(in percent of GDP, cumulative)</td>
<td>(in percent, cumulative)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AMs</th>
<th>LIDCs</th>
<th>AMs</th>
<th>LIDCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>-5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>-10</td>
<td>-5</td>
<td>-5</td>
</tr>
<tr>
<td>-10</td>
<td>-20</td>
<td>-10</td>
<td>-10</td>
</tr>
</tbody>
</table>

-1 1 3 5 7 9