



Historical Patterns and Dynamics of Public Debt – Evidence From a New Database

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Motivation and Objectives

- Renewed interest in historical episodes of large public debt changes since the financial crises:
 - Provide a public good
 - Examine—in a historical context—the drivers of large episodes of debt changes for 19 advanced economies



Preview of Key Findings

- Debt data very elusive, with different definitions and coverage
- Historical pattern of negative correlation between debt and growth
- Episodes of debt declines were mainly driven by the primary balance, while debt build-up episodes were associated with larger stock-flow adjustments
- Asymmetry in debt drivers over time



I. Historical Public Debt Database (HPDD)

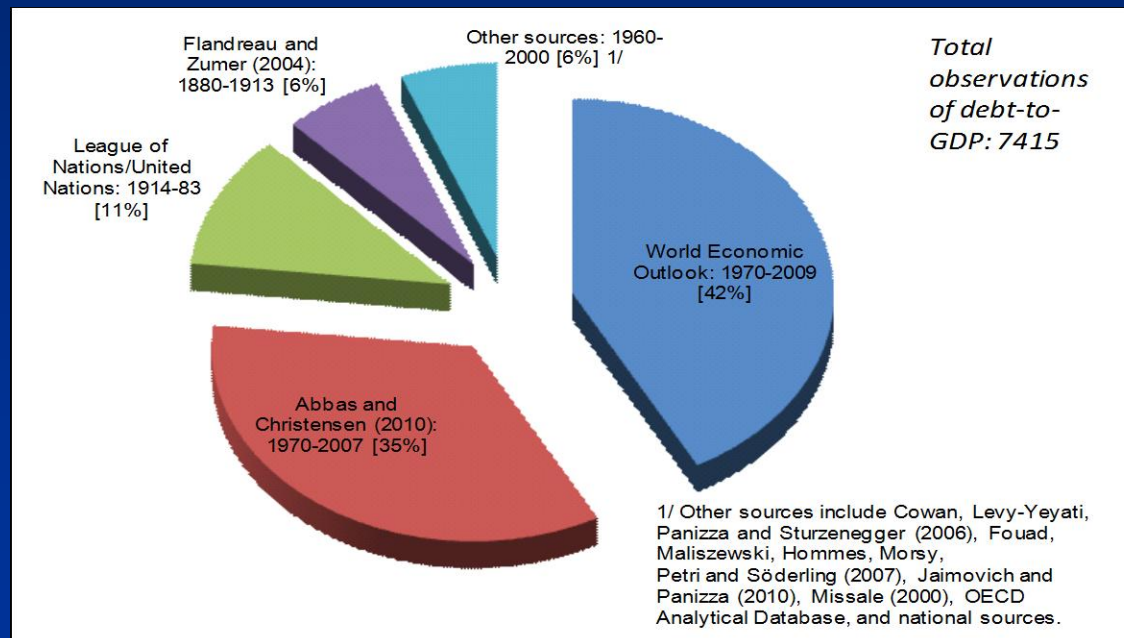


Existing Datasets

- IFIs and regional bodies electronic databases: WEO, IFS, GDF, OECD, and ECLAC—*Most widely used, but limited coverage*
- Individual Researchers: Missale (2000), Flandreau and Zumer (2004), Christensen (2005), Cowan et al. (2006), Guscina and Jeanne (2006), Fouad et al. (2007), Jaimovich and Panizza (2010), Abbas and Christensen (2010)—*Limited coverage and not updated*
- Reinhart and Rogoff (2010)
 - Coverage is deep but not wide
 - Subject the data to manipulations

Data Overview

- **Unbalanced panel: 1880-2009 with 174 countries**
- **Data sources: Statistical handbooks, official publication, and individual datasets**



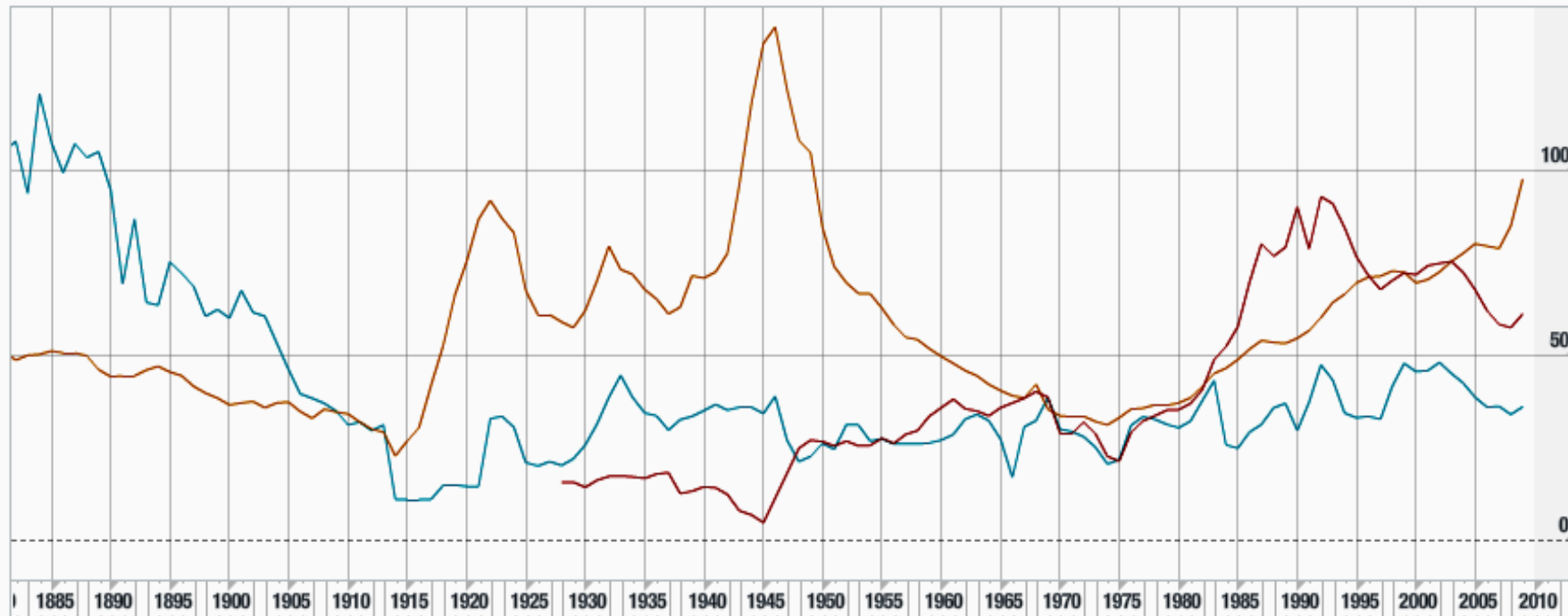
Evolution of Debt-to-GDP Across Countries (1880-2009; group PPPGDP averages, percent)



IMF Data Mapper ®

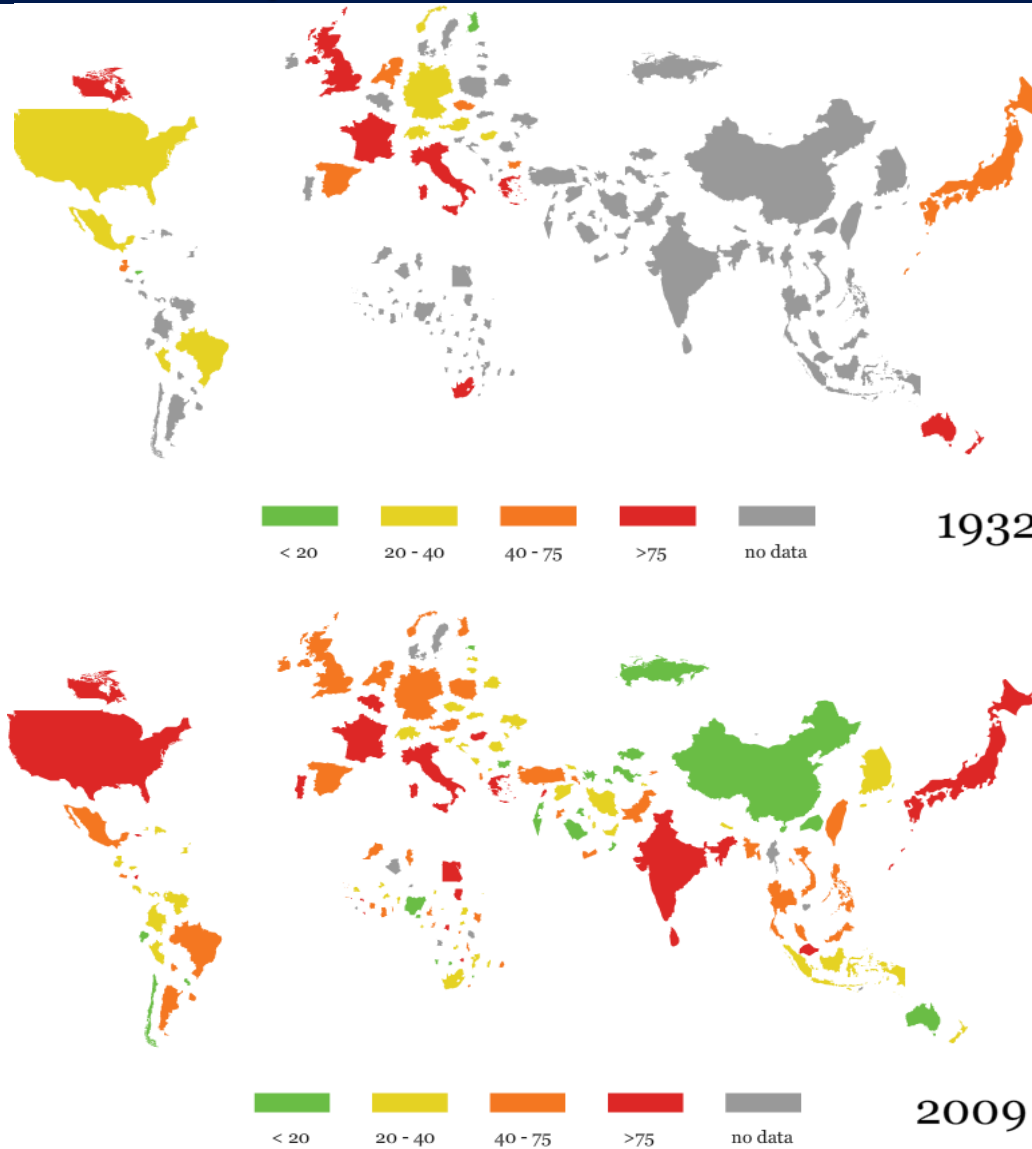
DEBT (% of GDP)

- G-20 Advanced
- G-20 Emerging
- Low Income



©IMF, 2010, Source: Fiscal Affairs Departmental Data

A Tale of Two Crises: *The Great Depression Vs. The Great Recession*

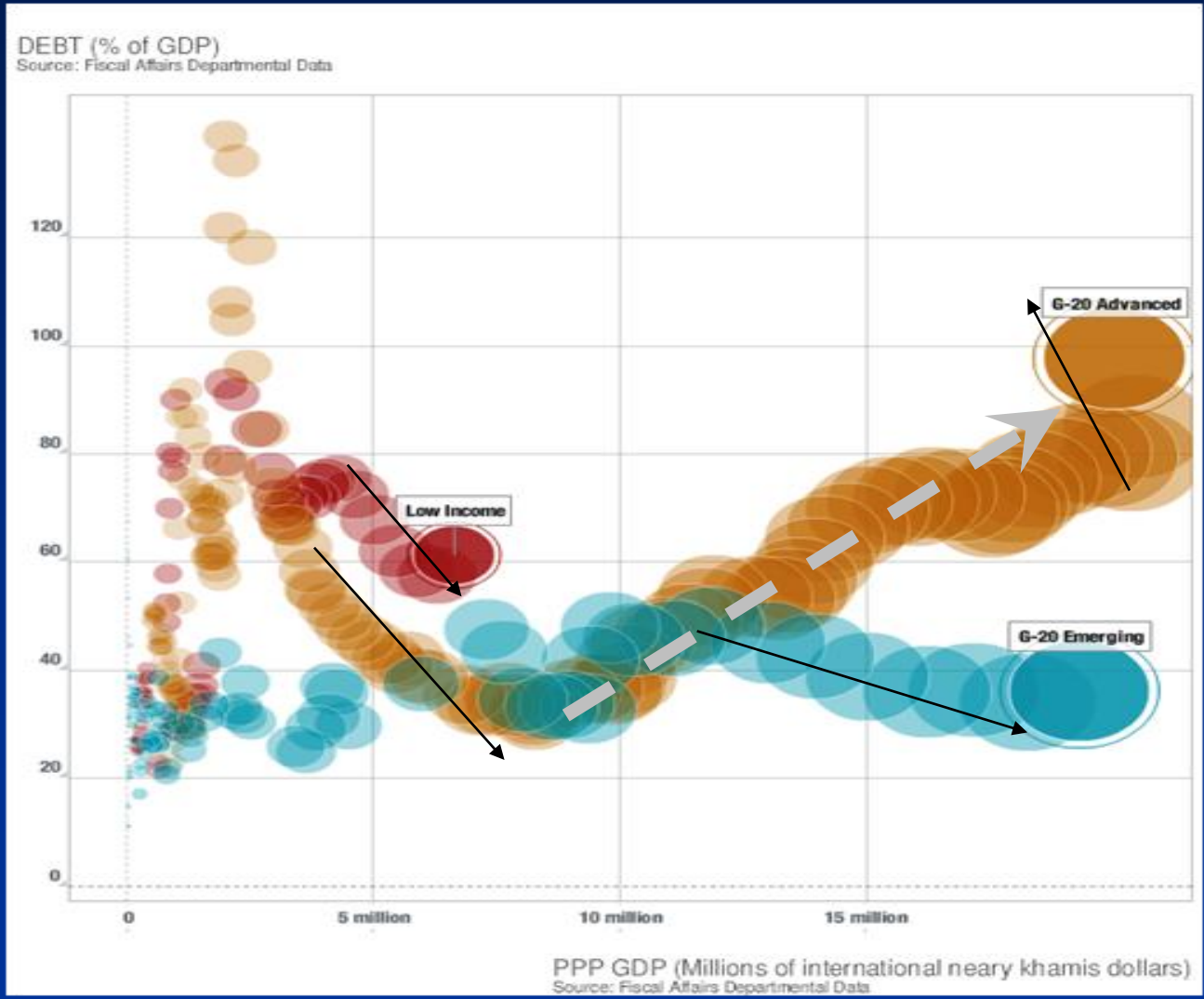


color-coded for debt-to-GDP ratios; countries sized by 2009 PPPGDP

The current situation looks worse because of three factors:

- Weaker starting positions (debt in 2007 20 ppt. higher than in 1928)
- Sharper drop in revenues (due to stronger asset-price/financial sector link)
- Stronger fiscal stimulus and financial sector support

Relationship Between Debt and Growth



Was the contemporaneous increase in debt levels and incomes since 1970 in advanced economies anomalous?



II. Sources of Large Public Debt Changes in Advanced Economies



Literature on Key Sources of Debt Changes

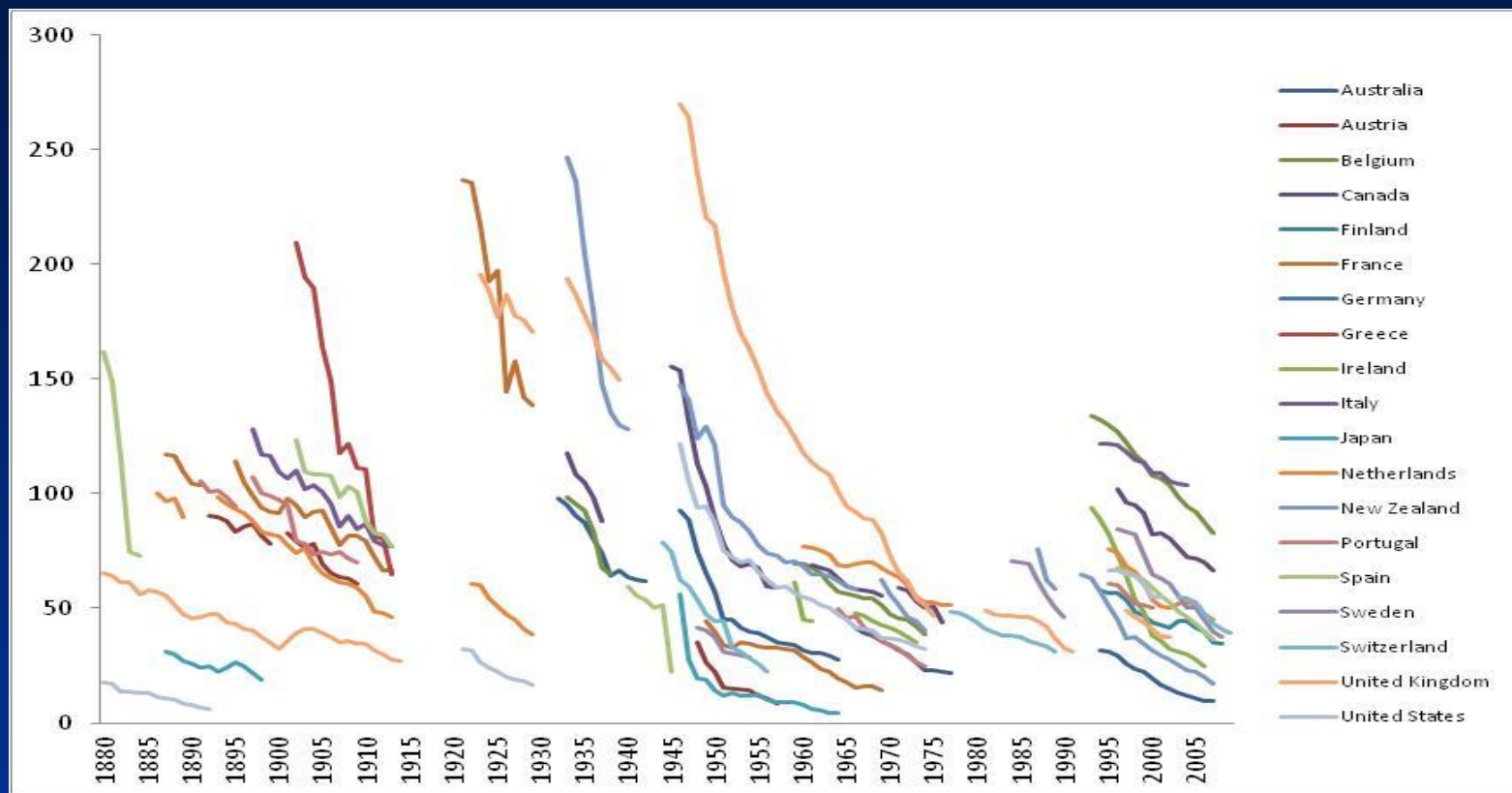
- Easterly (2001): growth
- Campos et al. (2006): stock-flow adjustment term
- IMF (2010): primary surplus
- Reinhart and Sbrancia (2011): real interest rates and “debt liquidation”



Methodology of Episode Identification

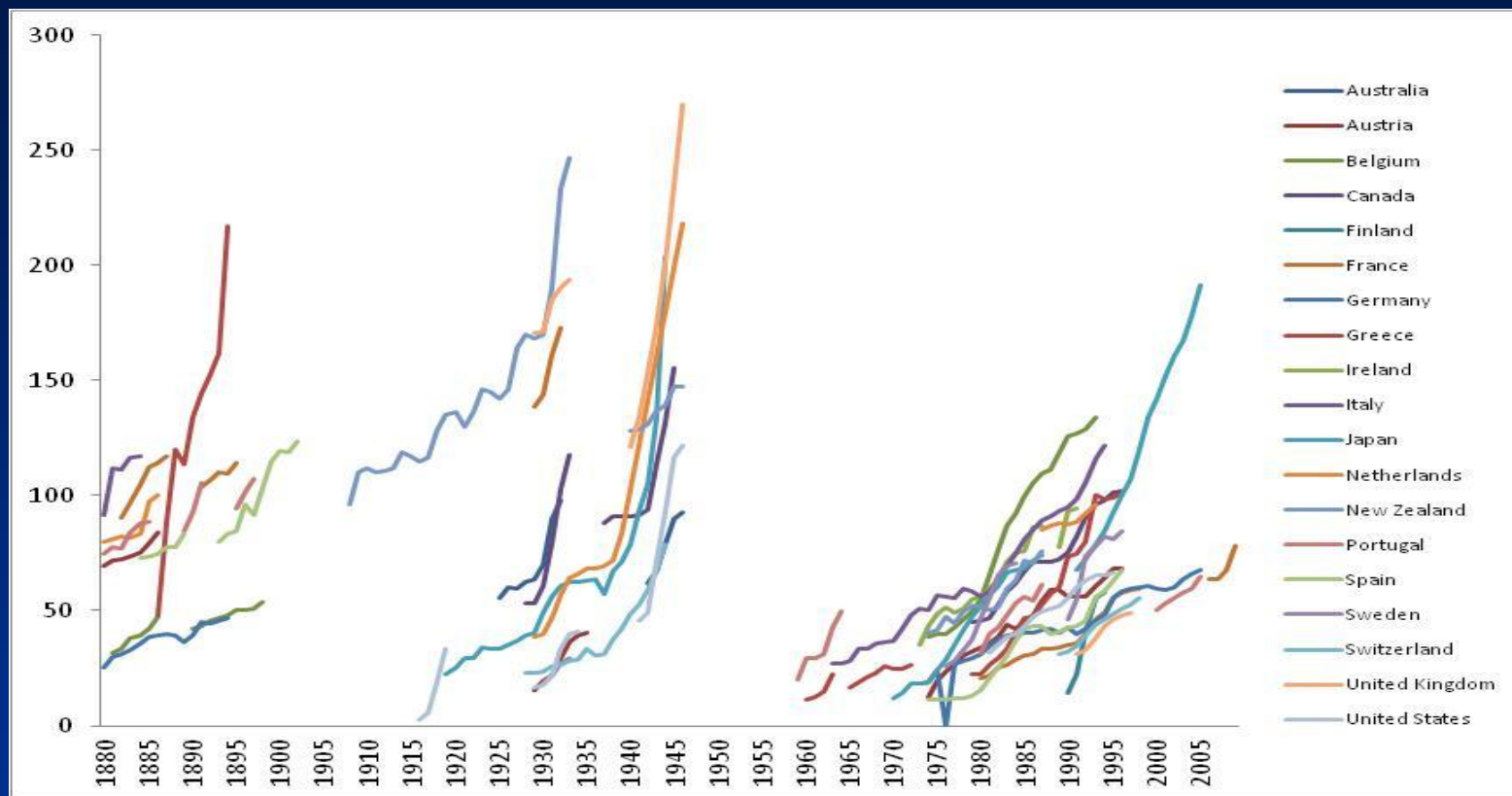
- Focus on sustained changes in sovereign indebtedness
- Major episodes: changes of more than 10 percentage points in the debt ratio, allowing temporary reversals
- Extracted 66 episodes of debt declines and 63 episodes of debt increases

Distribution of Debt Decline Episodes



- Most episodes were long (more than 5 years)
- Half of episodes had a high start debt-to-GDP ratio ($\geq 80\%$)
- 2/3 of episodes were large (decline of more than 20 ppt)
- 2/3 of episodes recorded “slow” declines (less than 5 ppt/year)

Distribution of Debt Build-Up Episodes



- Most episodes were long (more than 5 years)
- 2/3 of episodes had a low start debt-to-GDP ratio (<60%)
- 2/3 of episodes were large (increase of more than 20 ppt)
- 2/3 of episodes recorded “slow” increases (less than 5 ppt/year)

Methodology of Debt Decomposition and Fiscal Flow Data Collection



$$d_t - d_{t-1} = \frac{i_t - \gamma_t}{1 + \gamma_t} d_{t-1} - p_t + sfa_t$$

- Debt decomposition: standard equation with an sfa term—Limitation
- Data on primary balances and interest payments from 1880-2010 for 19 advanced economies (14 EU)
- Data sources: Official Sources, UN, LoN, Flandreau and Zumer (2004), OECD, and WEO

Illustration: Decomposition of Large Debt Decline Episodes for the U.S.



Decomposition of Large Debt Reduction Episodes in the US, 1880--2009
(In percent of GDP)

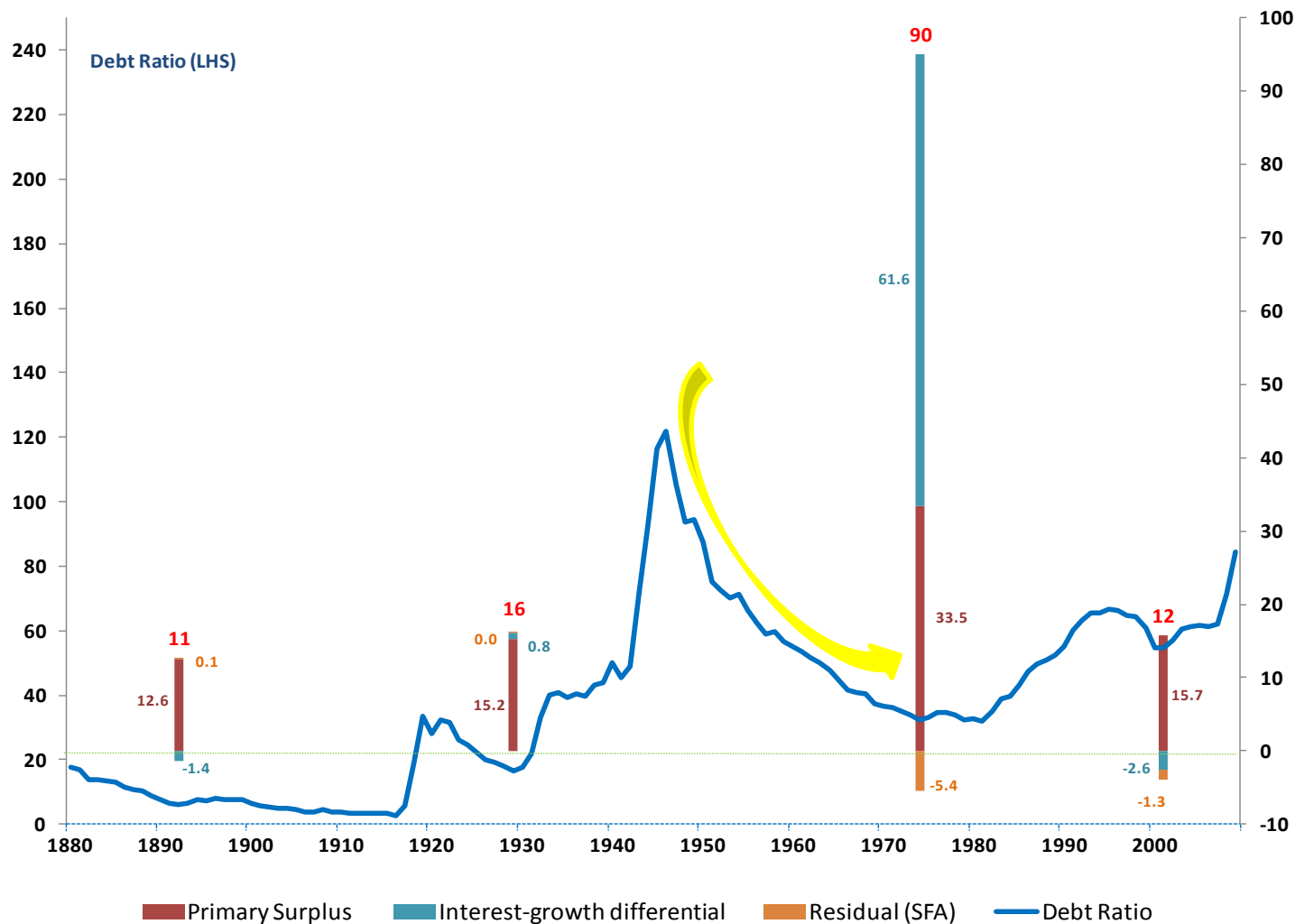
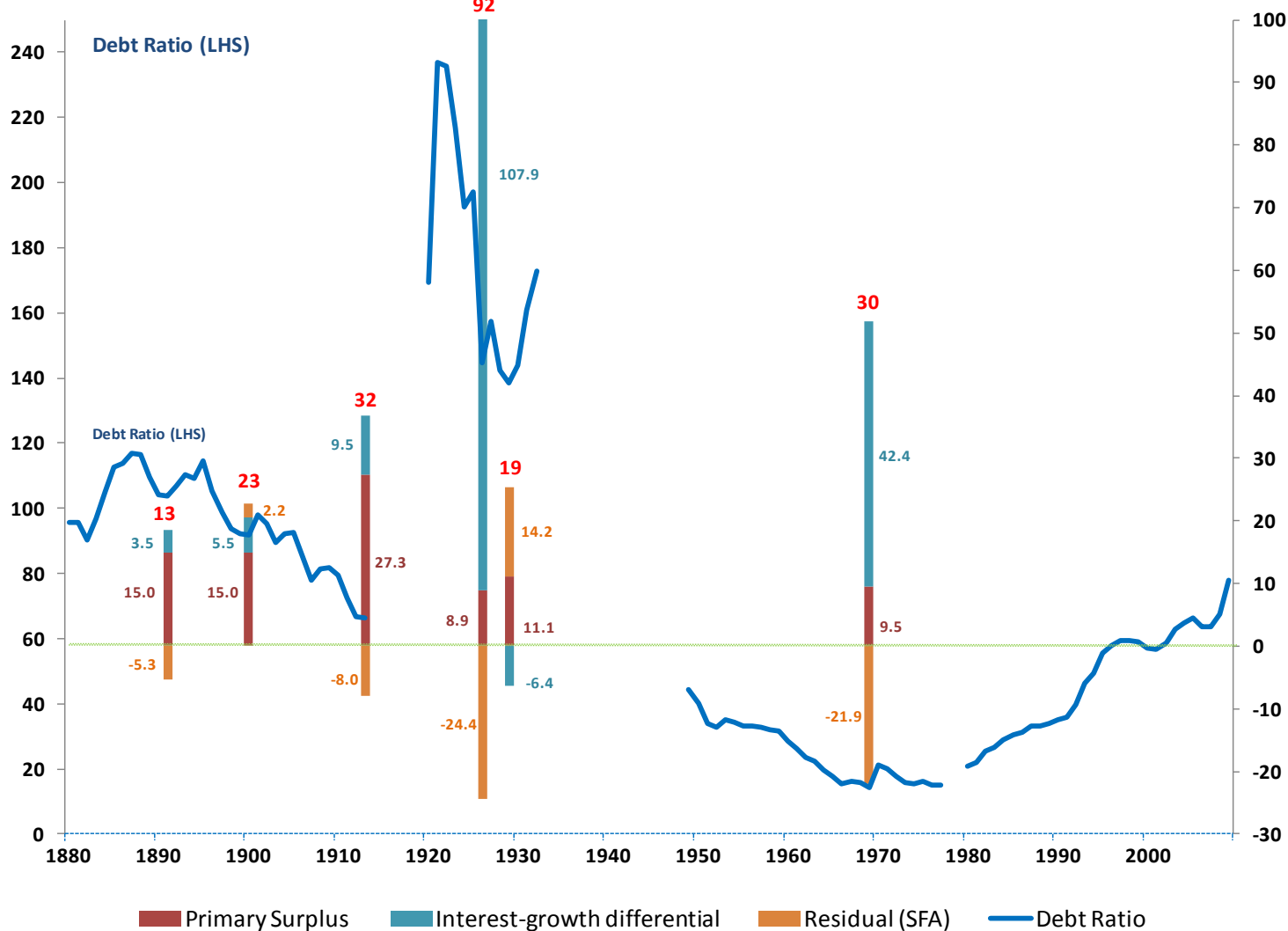


Illustration: Decomposition of Large Debt Decline Episodes for France



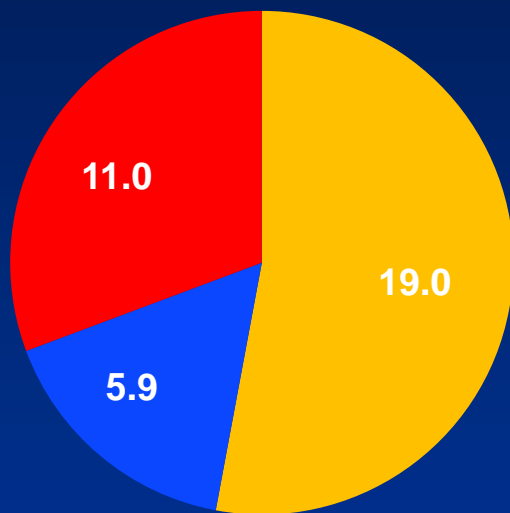
Decomposition of Large Debt Reduction Episodes in France, 1880--2007
(In percent of GDP)



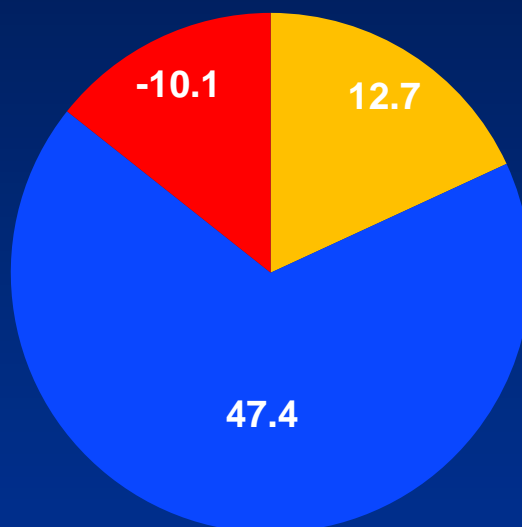
Sources of Debt Decreases Over Time



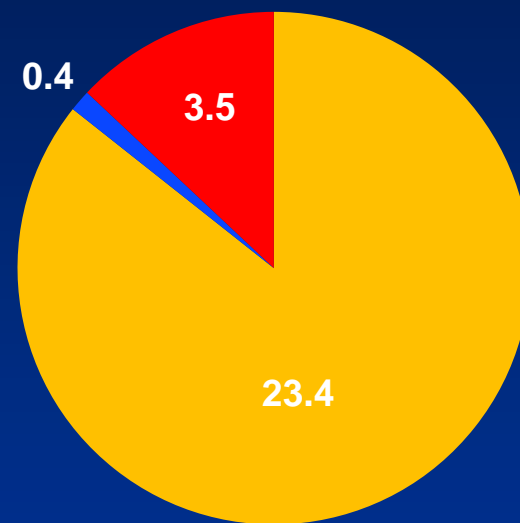
Before 1914
(av. reduction of 36 percentage points)



1945-1970
(av. reduction of 50 percentage points)



After 1970
(av. reduction of 27 percentage points)



- Primary surplus
- Interest-growth differential
- SFA residual

Full sample median: decrease of 26 percentage points originating from primary balance (15%) and debt dynamics (12%)

Interest-Growth Differential was a Main Driver of Debt Declines Post World War II

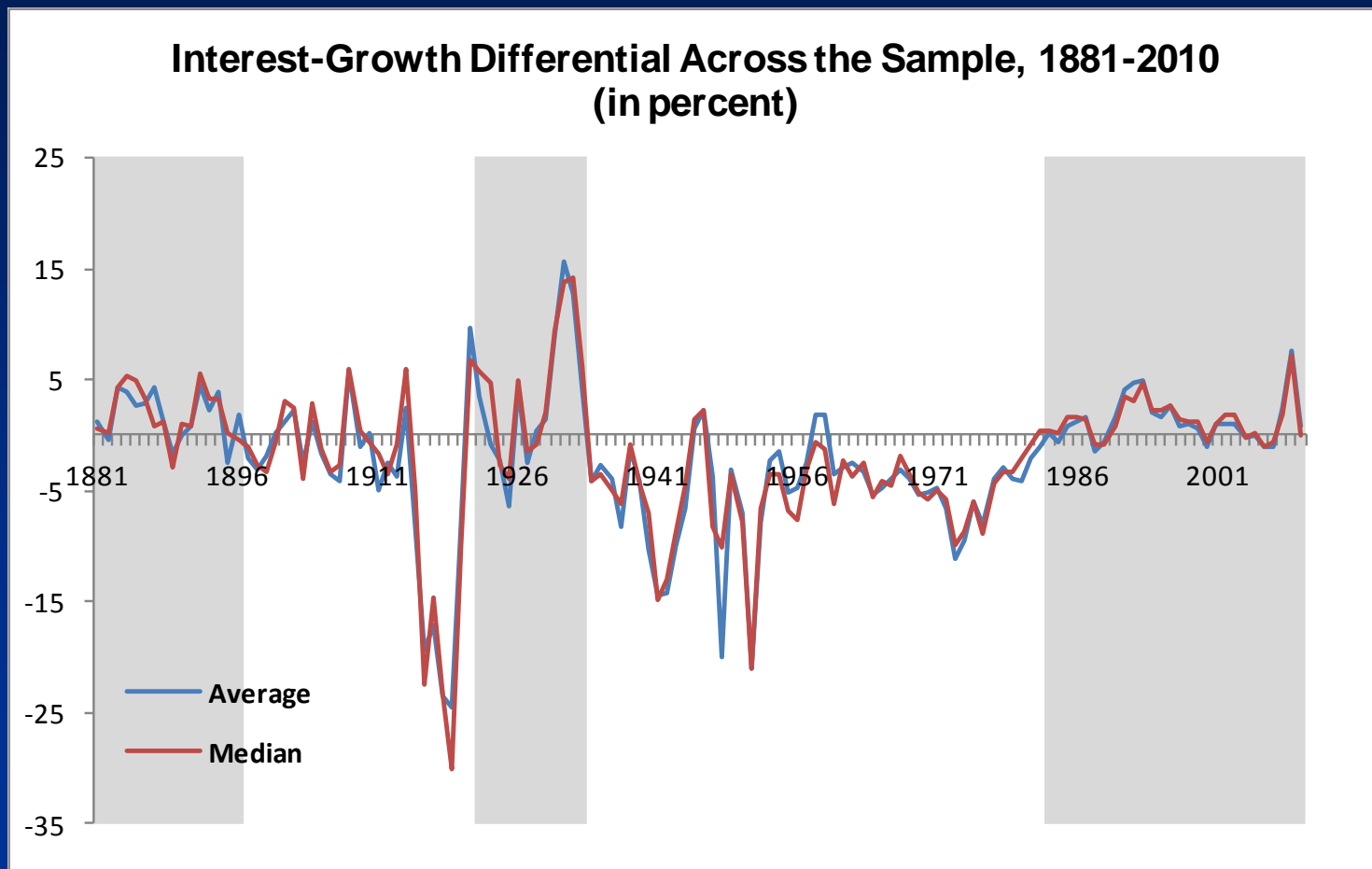


Illustration: Decomposition of Large Debt Build-Up Episodes for Japan

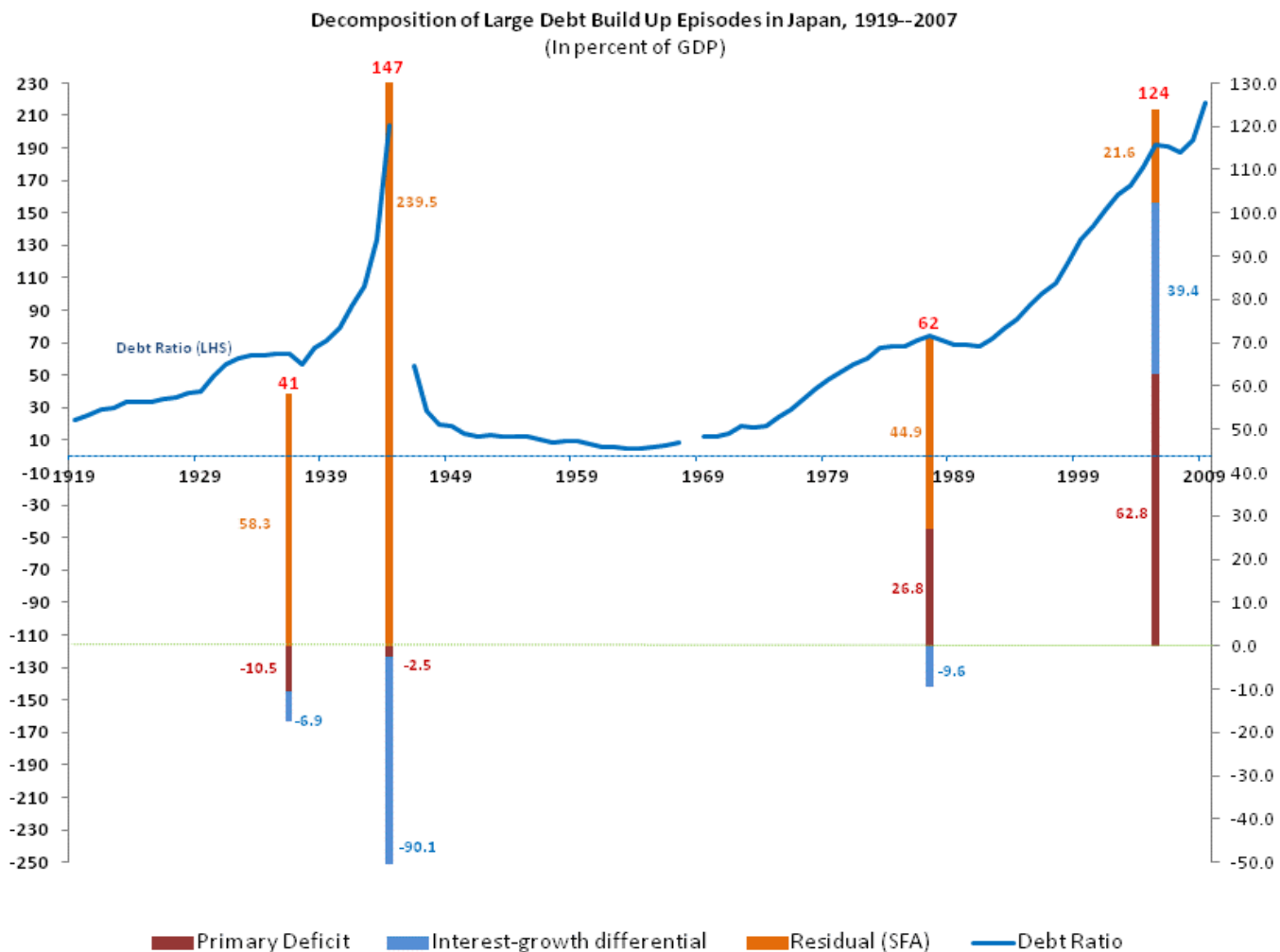
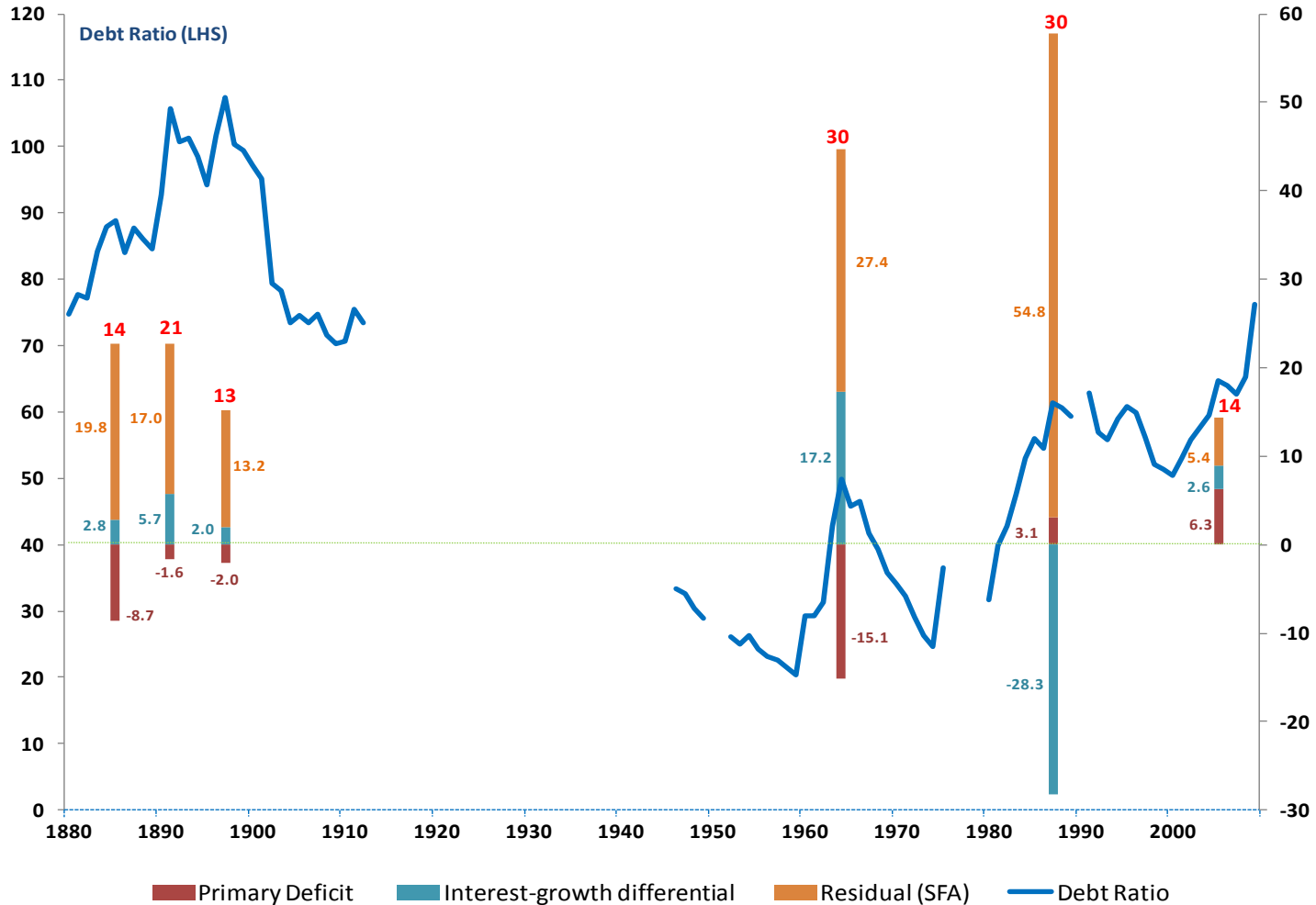


Illustration: Decomposition of Large Debt Build-Up Episodes for Portugal



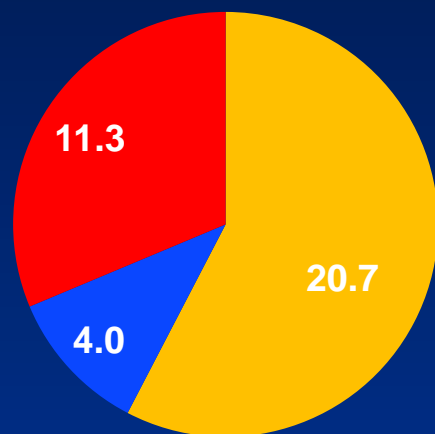
Decomposition of Large Debt Build Up Episodes in Portugal, 1880--2007
(In percent of GDP)



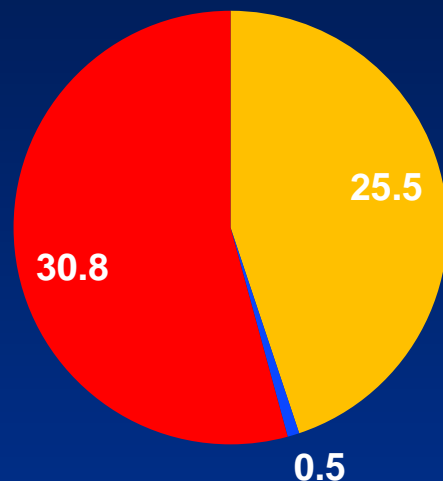
Sources of Debt Increases Over Time



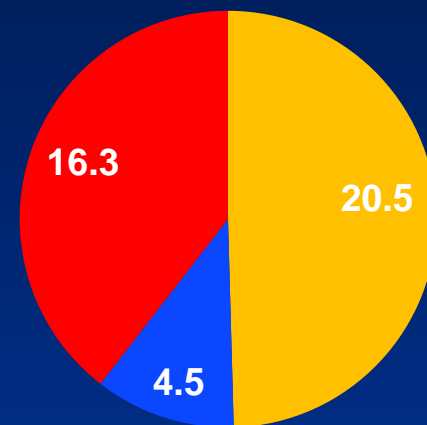
Before 1914
(av. increase of 36 percentage points)



1945-1980
(av. Increase of 60 percentage points)



1980-2007
(av. Increase of 41 percentage points)



- Primary deficit
- Interest growth differential
- SFA residual

- Full sample median: increase of 31 percentage points from primary balance (6%), debt dynamics (7%) and sfa term (17%)
- Current financial crisis (2007-2010): on average 23 percentage points rise from primary balance (10%), debt dynamics (8%) and sfa term (5%)

Behavior of The Unexplained Part of Debt

Stock-Flow Adjustment (SFA) Residual		
	For debt increase episodes (63)	For debt decrease episodes (66)
Number of occurrences of positive SFAs	55	30
"Absolute SFA" ÷ "Δ debt" (median ratio over episodes)	45 %	29 %

- Positive SFAs observed in almost all episodes of debt increases, but only in about half of debt decline episodes
- “Absolute SFAs” contributed half of the increases in debt. However, during 2007-10, |SFA| contributed about a quarter of the debt increases
- SFAs could reflect poor data quality, currency valuation effects, and/or “below-the-line” nature of fiscal costs during crises
- They could also reflect “fiscal transparency under pressure”: an attempt to hide deficits/spending in bad times



Summing up and Future Work

- The primary balance has been a major source of debt declines. But (i-g) quite favorable right after WW II
- Debt build-ups were associated with notably larger SFAs. Primary deficits relatively less prominent (esp. over 1914-1980)
- Periods of free capital movement appear to afford less scope for delivering favorable (i-g) to liquidate debt
- **Ideas for further work:**
 - Unpack SFAs: debt assumptions/restructuring? valuation effects? other?
 - Revenue-expenditure mix
 - Quantify “cyc.adj” primary deficit component
 - Sustainability tests (fiscal policy reaction function)



Thank you!