International Monetary Fund

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Bailing Out the People?
When Private Debt Becomes Public

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The views expressed in this presentation are those of the authors and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

"While the focus has been on the Dow Jones and Wall Street, we are addressing the real pain felt by Mr. and Mrs. Jones on Main street. They are why we must pass this legislation today."
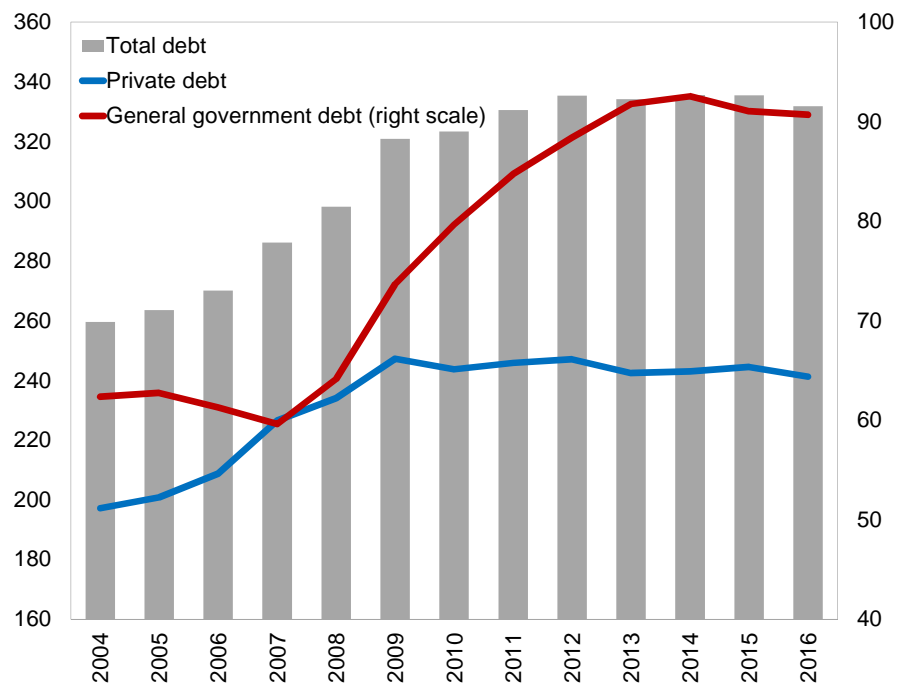
Nancy Pelosi, Statement in support of the Emergency Economic Stabilization Act
(October 3, 2008)

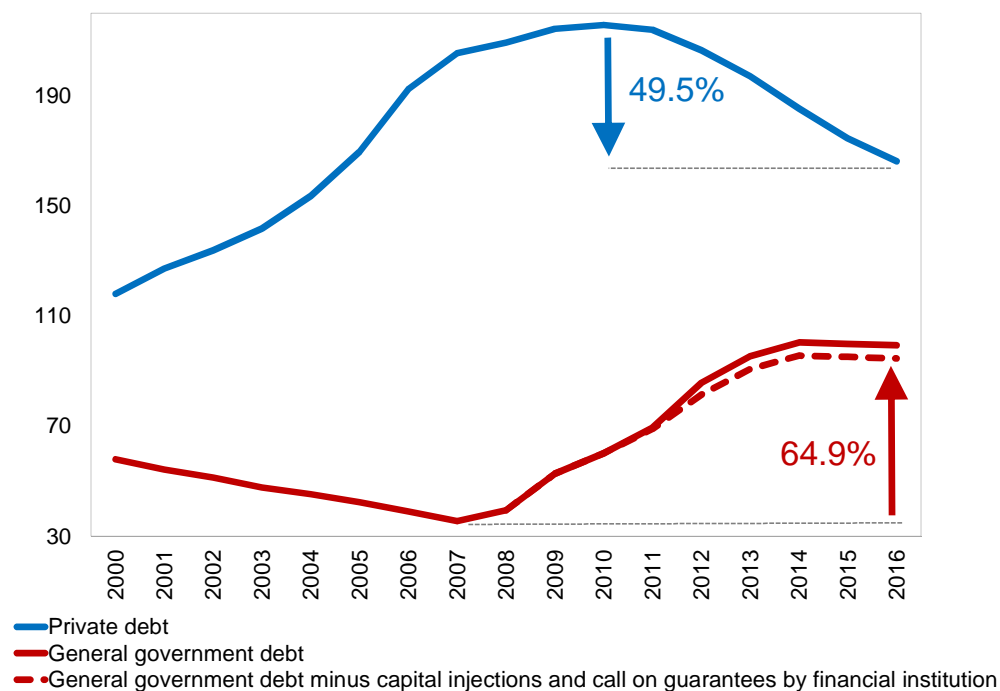# Apparent "debt migration" after the GFC

Advanced Economies: Gross Debt
(Percent of GDP)

Spain Gross Debt
(Percent of GDP)

Sources: Eurostat; Global Debt Database; and authors' calculations.

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Motivation   Data & Methodology   Results   Causality   Conclusions
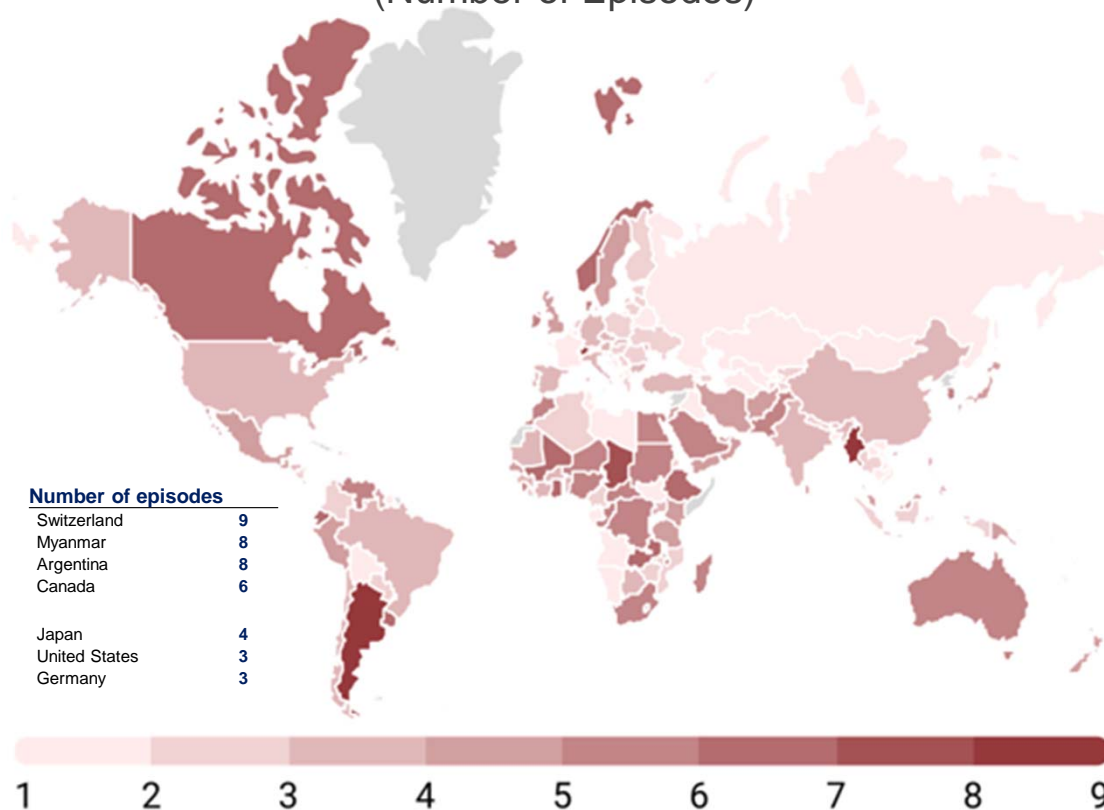
The Million Dollar Questions…

Does Private Deleveraging Always Trigger a Rise in Public Debt?

Through What Channels?

When Does Overall Indebtedness Increase?

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Unparalleled Coverage of Private Deleveraging

**Incidence of Private Deleveraging, 1950–2016**
(Number of Episodes)

Number of episodes

Switzerland	9
Myanmar	8
Argentina	8
Canada	6
Japan	4
United States	3
Germany	3

1   2   3   4   5   6   7   8   9

Global Debt Database

- **Building on the Fall 2016 Fiscal Monitor**
- **543 episodes**
- **153 countries**
- **1950-2016**
- **AEs, EMEs, LICs**
- **Crisis & Non-crisis**

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Motivation > Data & Methodology > Results > Causality > Conclusions

# Private Deleveraging: Are We Measuring the Right Thing?

Private Debt and Leverage Flows in the United States
(Annual change, percent of GDP)

Sources: Global Debt Database; and authors' calculations.

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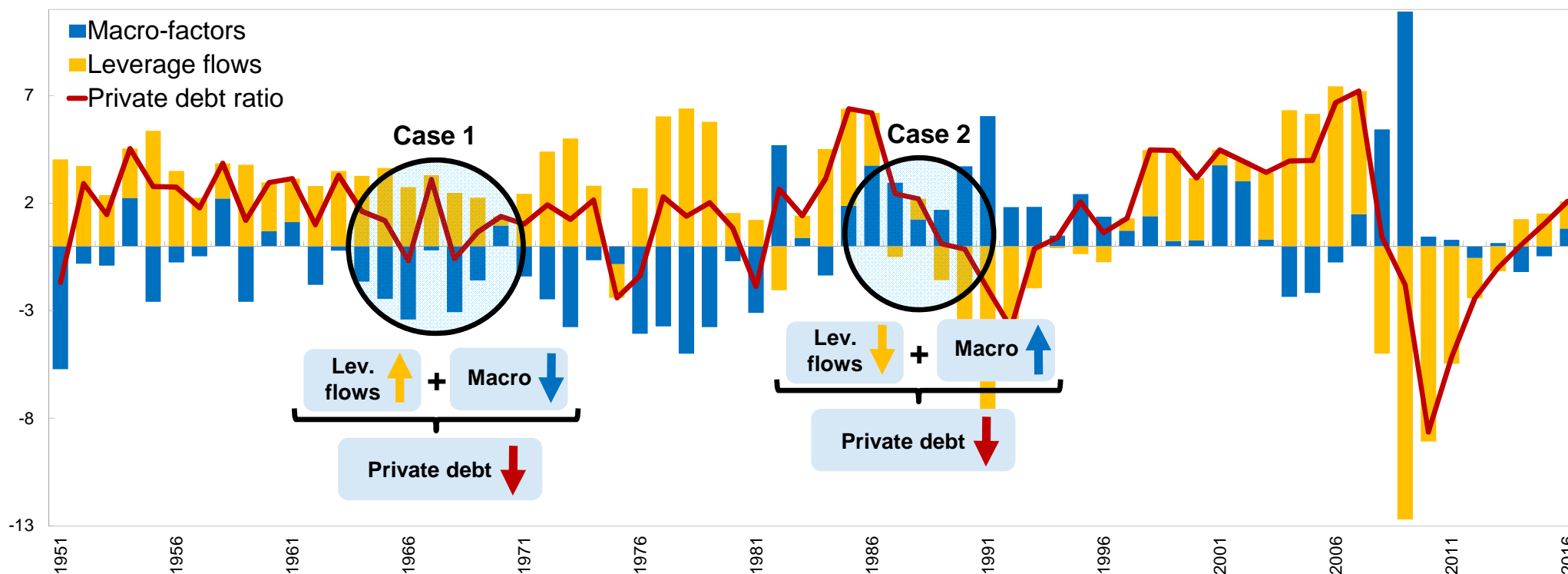
Motivation ▶ Data & Methodology ▶ Results ▶ Causality ▶ Conclusions

A Descriptive Framework to Tell the Story of Deleveraging

Private Debt and Leverage Flows in the United States
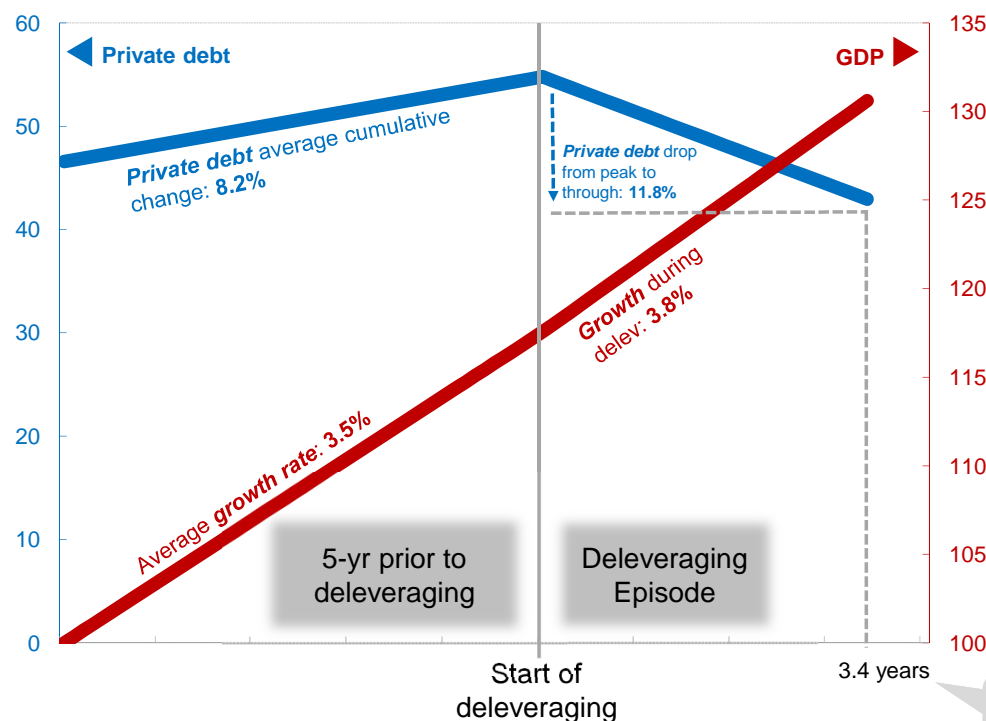(Annual change, percent of GDP)
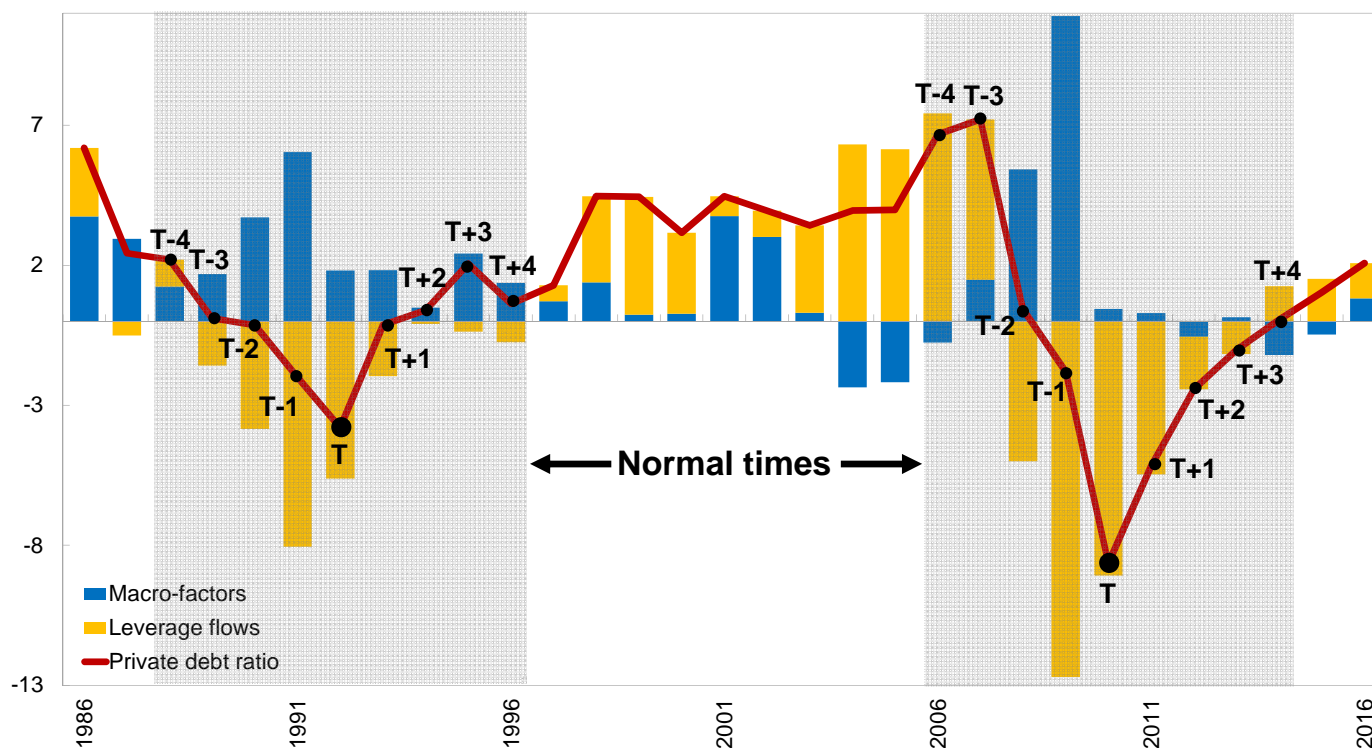
Gourinchas and Obstfeld (2012)

$$y_{it} = \alpha_i + \sum_k \beta_{t+k} T_{ik} + \varepsilon_{it}$$

Sources: Global Debt Database; and authors' calculations.

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Private Deleveraging since World War II
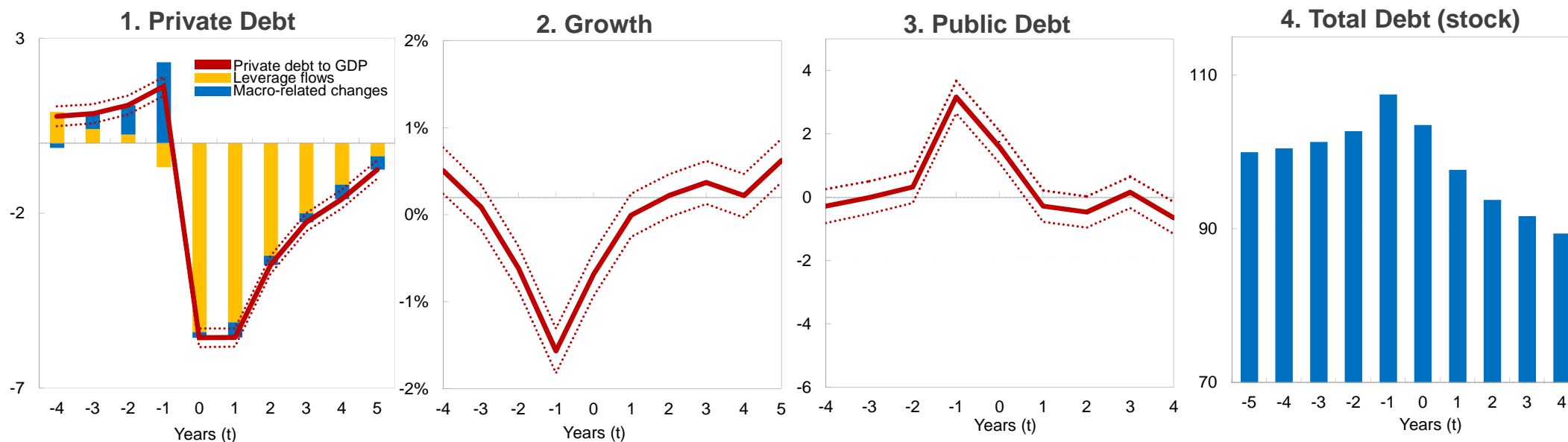
World: Private Deleveraging Episodes

Private Deleveraging Episodes by Income Group

	AEs	EMEs	LIDCs
Length (years)	3.9	3.3	3.5
Size (drop from peak to through, % of GDP)	-18.6	-15.2	-6.2
Peak private debt (average, % of GDP)	132.7	52.6	20.6
Pre-delev. change in debt (average of 5-yr cum. change, % of GDP)	16.9	8.8	3.1
Pre-delev. growth (average of 5-yr, percent)	3.0	4.0	3.3
Growth during delev. episodes (average, percent)	3.5	4.1	3.9
Number of episodes	114	181	248
Probability of deleveraging (share of deleveraging obs.)	25%	27%	30%

Number of episodes: 543
Probability of deleveraging: 28%

Sources: Global Debt Database; and authors' calculations.
Note: AEs = advanced economies; EMEs = emerging market economies; LIDCs = low-income developing countries.

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| Motivation | Data & Methodology | Results | Causality | Conclusions |

The Typical Deleveraging Episode

1. Private Debt

Legend:
- Private debt to GDP (red)
- Leverage flows (yellow)
- Macro-related changes (blue)

X-axis: Years (t) from -4 to 5

2. Growth

X-axis: Years (t) from -4 to 5

3. Public Debt

X-axis: Years (t) from -4 to 4

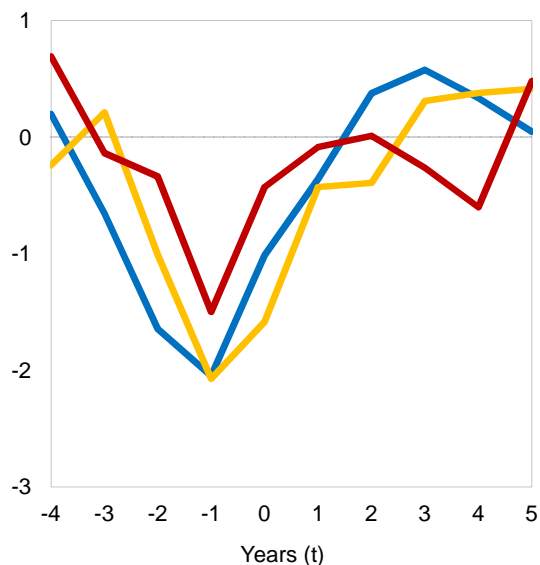### 4. Total Debt (stock)

X-axis: Years (t) from -5 to 4

Sources: Global Debt Database; and authors' calculations.
Note: The dotted line denotes the 95 percent confidence interval for each conditional mean.

Motivation → Data & Methodology → Results → Causality → Conclusions

The Private-Public Debt Tango: A Global Phenomenon

1. Private Debt
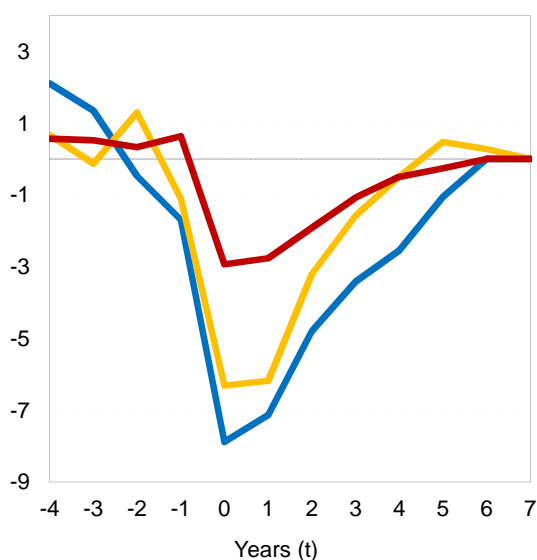
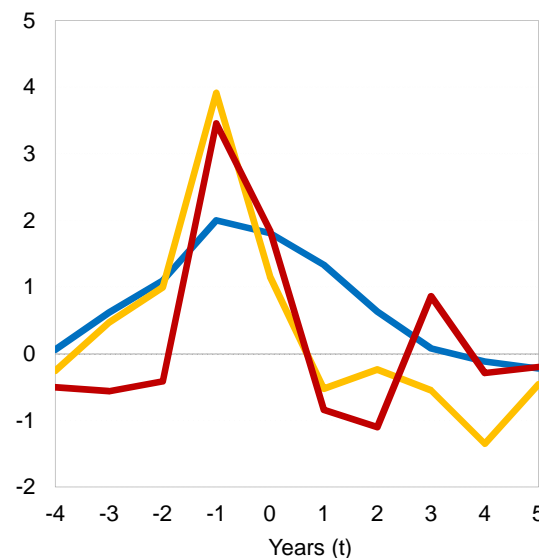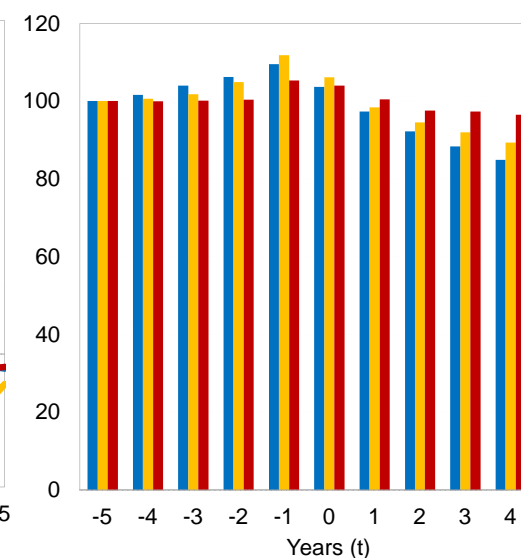### 2. Real Growth

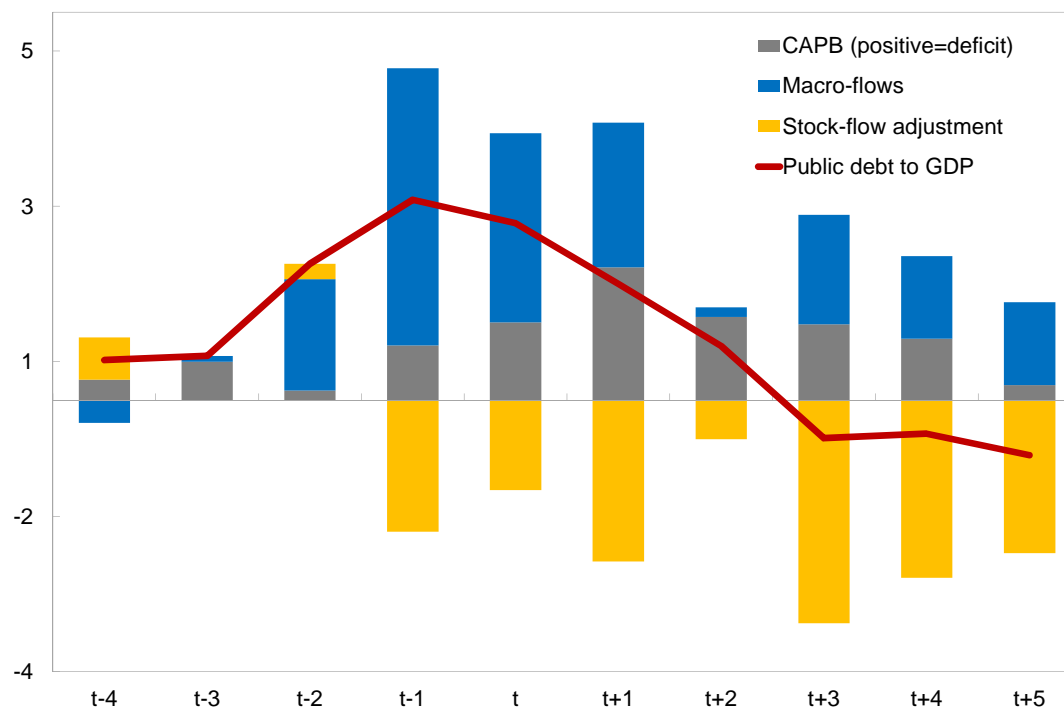### 3. Public Debt

4. Total Debt (Stock)

Years (t)

Advanced economies   Emerging market economies   Low-income developing countries

Sources: Global Debt Database; and authors' calculations.

Motivation → Data & Methodology → Results → Causality → Conclusions

Bailout or Growth Story?

Advanced Economies: Sources of Change in Public Debt during Private Deleveraging

Legend:
- CAPB (positive=deficit)
- Macro-flows
- Stock-flow adjustment
- Public debt to GDP

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Motivation → Data & Methodology → Results → Causality → Conclusions

It is NOT just a Crisis Story

1. Private Debt

2. Public Debt

3. Total Debt

4. Real Growth

Without crisis   With crisis

Sources: Global Debt Database; and authors' calculations.
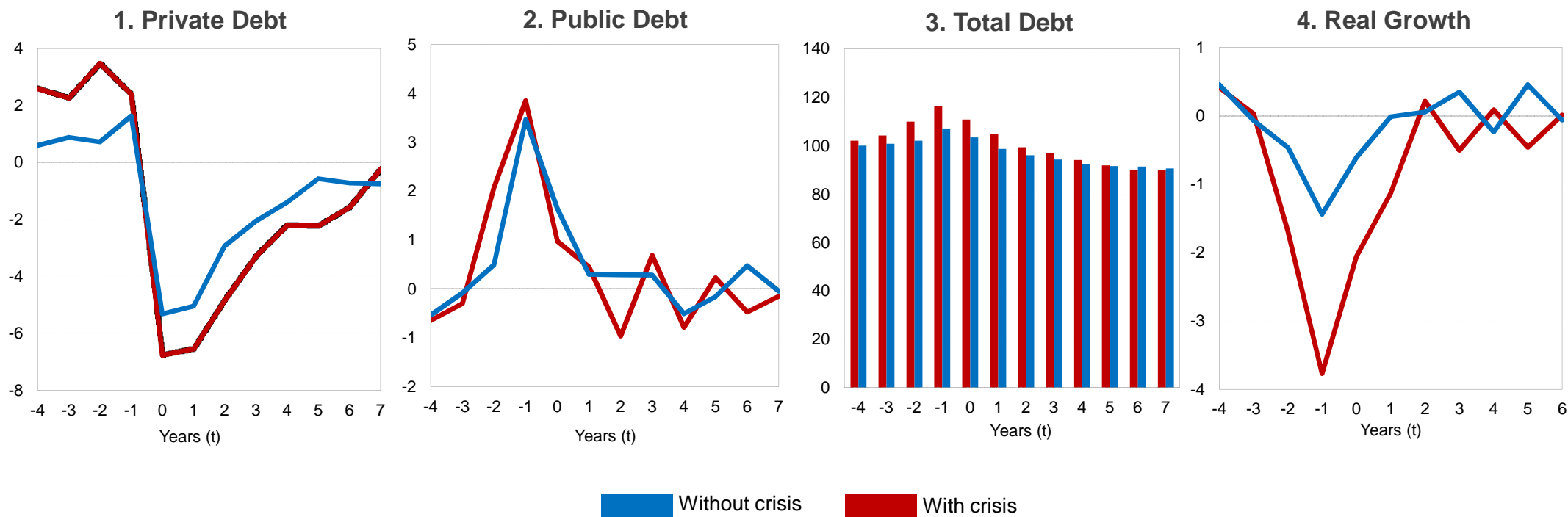
Motivation → Data & Methodology → Results → Causality → Conclusions

The " Unsuccessful" Deleveraging
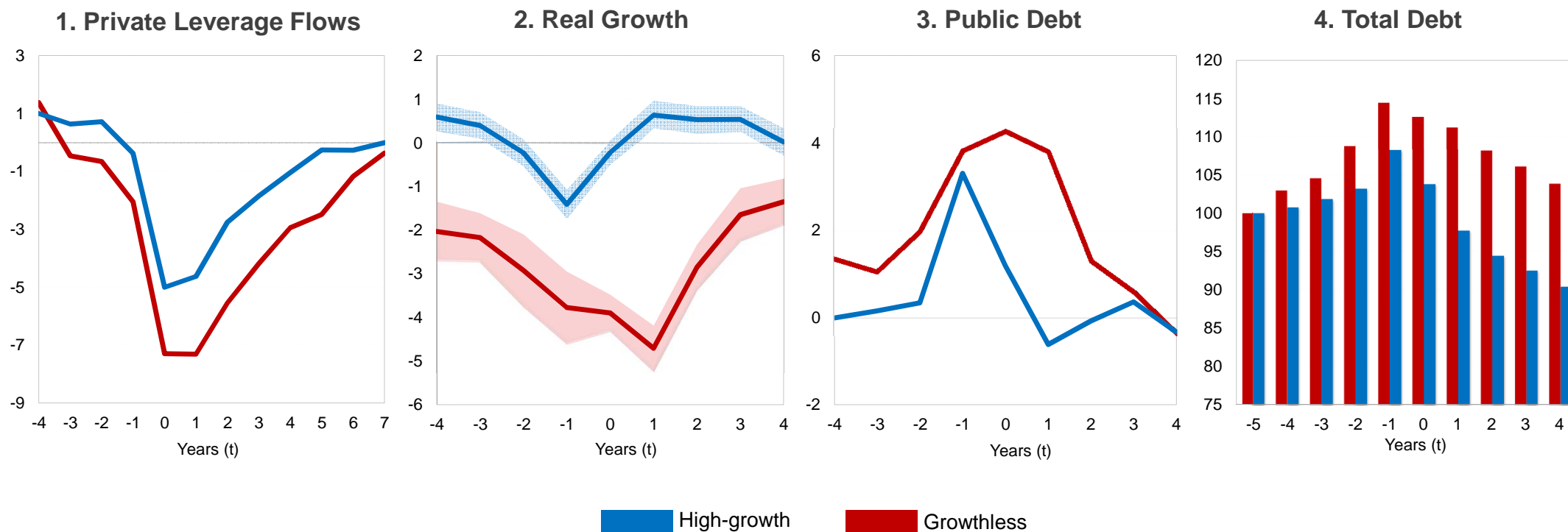
1. Private Leverage Flows

2. Real Growth

3. Public Debt

4. Total Debt

High-growth — Growthless

Sources: Global Debt Database; and authors' calculations.
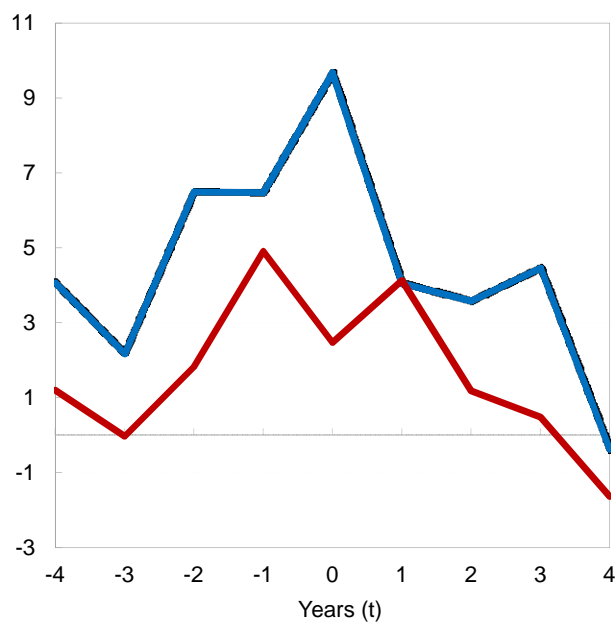Note: The dotted line denotes the 95 percent confidence interval for each conditional mean.

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Motivation → Data & Methodology → Results → Causality → Conclusions

Fiscal Policy to the Rescue?

1. Change in Public Debt

2. Real Growth
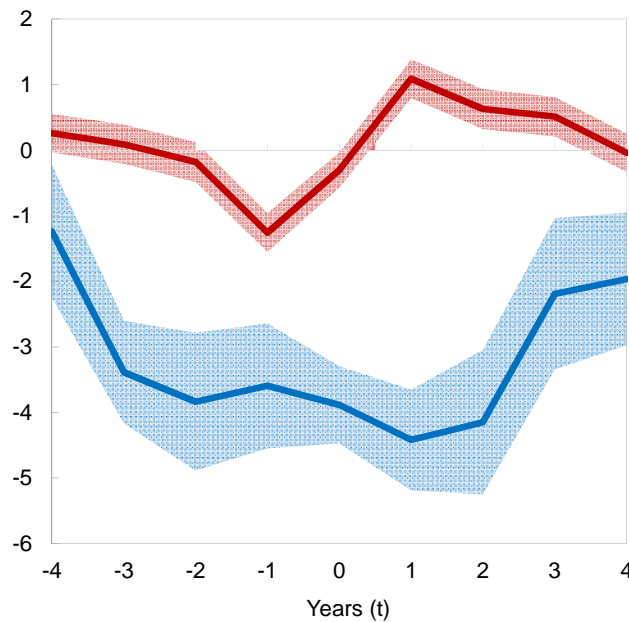
3. Total Debt (Stock)
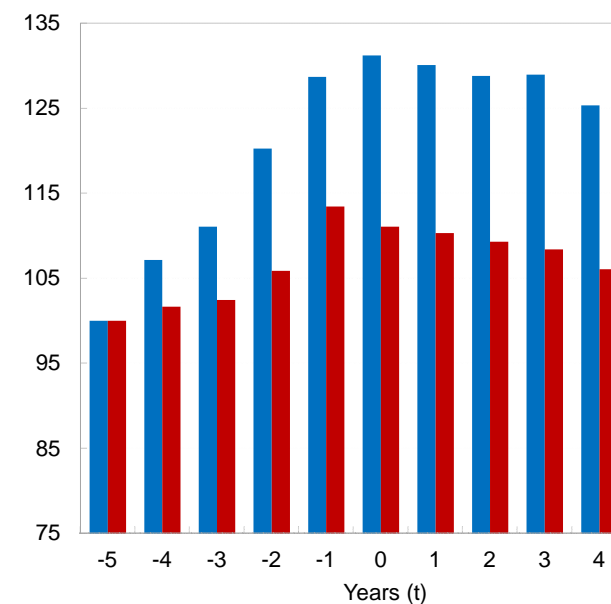
Strong government | Limited government

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Motivation | Data & Methodology | Results | Causality | Conclusions

Establishing Causality: a "Doubly Robust" Approach

Recast private deleveraging into a dichotomous "treatment"

Estimate the causal impact of private deleveraging using IPWRA

Inverse Propensity Weighting (IPW)	Regression Adjustment (RA)
❖ Step 1: Estimate the probability (p) of receiving the treatment ❖ Step 2: Weigh each country by 1/p	❖ Step1: Fit a linear model of growth and public debt ❖ Step 2: Use predictions from the latter as counterfactuals

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Motivation ➤ Data & Methodology ➤ Results ➤ Causality ➤ Conclusions

Our Specification

Private deleveraging	**Growth**	**Public debt**
❖ Lagged growth ❖ Lagged GDP per capita ❖ Crisis in the last 5 years ❖ Lagged private and public debt ❖ 3-yr cum. growth private and public debt ❖ Lagged private interest rates	❖ Lagged growth ❖ Lagged GDP per capita ❖ Lagged institution quality (RofL) ❖ Lagged inflation ❖ Lagged openness ❖ Lagged private and public debt	❖ Lagged growth and GDP per capita ❖ Crisis in the last 5 years ❖ Lagged private and public debt ❖ Lagged public interest rates ❖ Lagged aged dependency ratio ❖ Lagged institution quality ❖ Lagged fractionalization

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Motivation → Data & Methodology → Results → Causality → Conclusions

Causality Running from Private Deleveraging

1. GDP (percent)
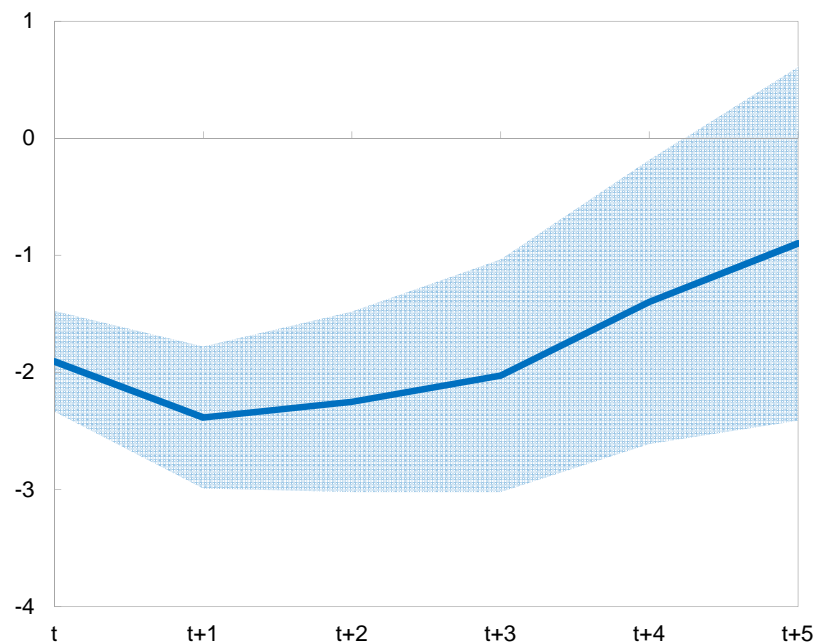
2. Public Debt (percent of GDP)

Sources: Global Debt Database; and authors' calculations.
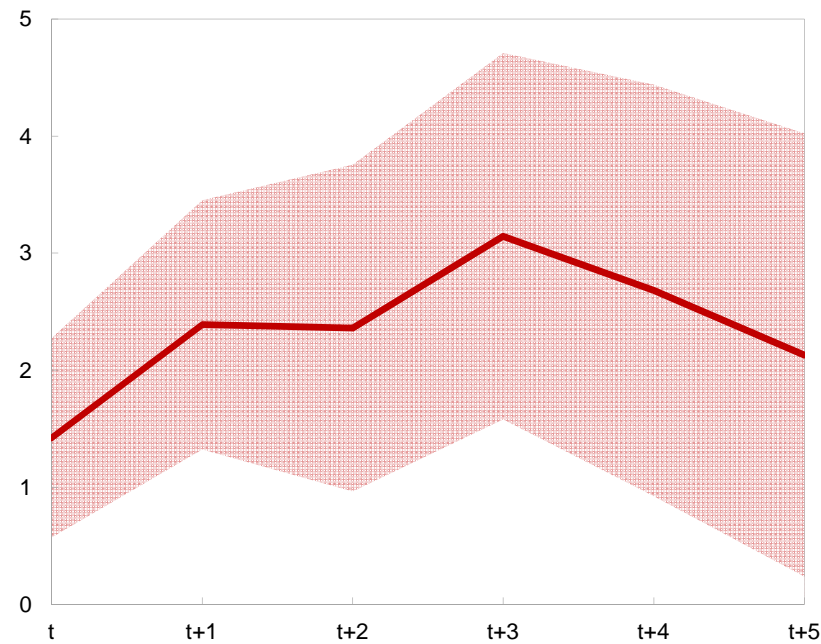
Motivation → Data & Methodology → Results → Causality → Conclusions

Conclusion

> ## You May End-up Paying your Neighbor's Mortgage

> ## …even Without a Crisis

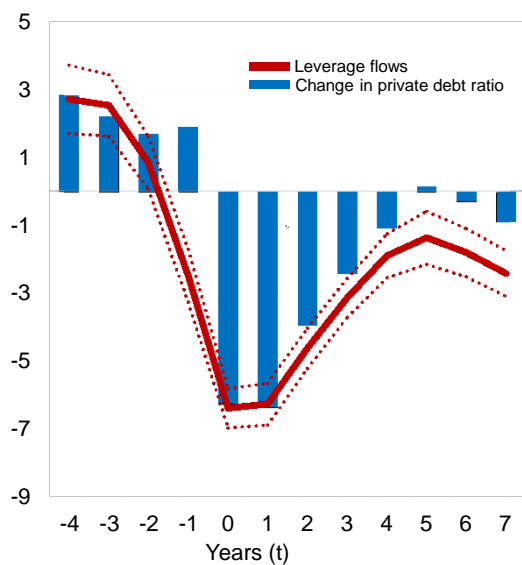> ## Implications for Debt Sustainability

April, 2018

COMING SOON!

The Global Debt Database

• *The largest private and public debt coverage of countries and years* •
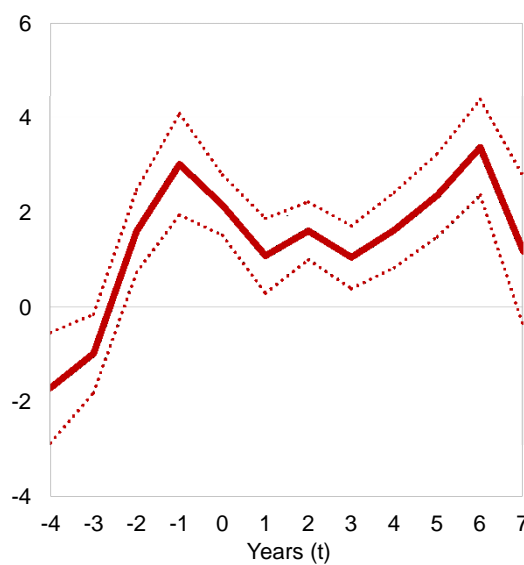• **Check www.IMF.org** •

Who Owed the Big Mo

Advanced Economies, 2016
(Percent of GDP)

| Japan 230% | Greece 181% | Portugal 134% | Italy 133% | Singapore 113% | Cyprus 108% | United States 107% |

United States

South Sudan · Malawi · Republic of Macedonia · Vanuatu · Kiribati · Namibia · Republic of Congo · Swaziland · Sierra Leone · Uzbekistan · Cote D'Ivoire · Tunisia · Burkina Faso · Djibouti · Trinidad and Tobago · Azerbaijan · Benin · Afghanistan · Niger · Cyprus · Uruguay · Kenya · Laos · Slovenia · Lebanon · Ecuador · Latvia · Lesotho · Nicaragua · Saudi Arabia · Costa Rica · Bhutan · Algeria · Kuwait · Bangladesh · Honduras · Armenia · Cameroon · Indonesia · Greece · South Africa · Belize · Bahrain · Russian Federation · Togo · Ghana · Switzerland · Sweden · Romania · Bulgaria · Mongolia · Ukraine · Republic of Korea · Hong Kong SAR · Iraq · Luxembourg · Austria · United Kingdom · Australia · Philippines · Yemen · New Zealand · Brazil

The 2010 Growth Accident

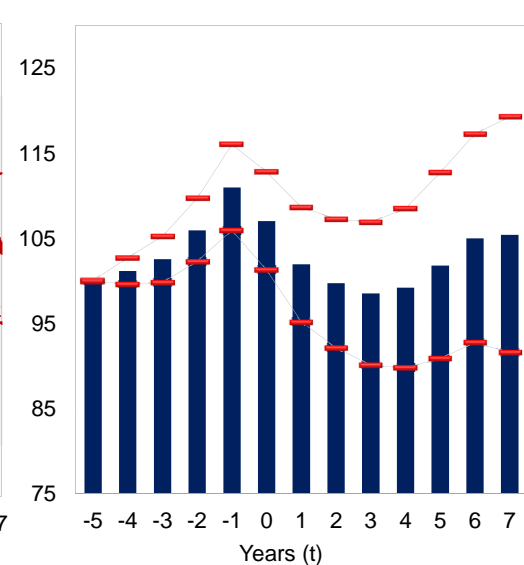**1. Private Debt**
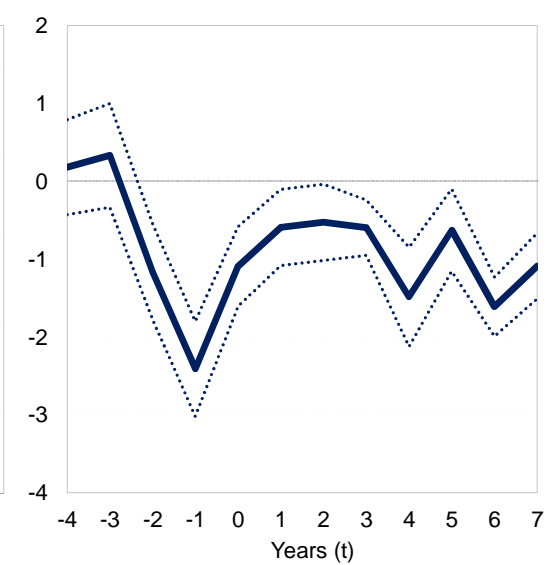- Leverage flows
- Change in private debt ratio

2. Public Debt

3. Total Debt

4. Real Growth

Sources: Global Debt Database; and authors' calculations.
Note: The dotted line denotes the 95 percent confidence interval for each conditional mean.

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Motivation → Data & Methodology → Results → Causality → Conclusions

Overlap and specification tests

Effects of Private Deleveraging on Past Growth and Public Debt

	Fixed-effects	IPWRA
GDP Growth (-2,-1)	-0.013***	-0.003
	(0.004)	(0.003)
Growth public debt (-2,-1)	-1.959	1.865
	(2.971)	(1.205)
GDP Growth (-3,-1)	0.010***	-0.003
	(0.004)	(0.003)
Growth public debt (-3,-1)	-1.761	1.257
	(3.123)	(1.354)
GDP Growth (-4,-1)	0.017***	0.006
	(0.008)	(0.007)
Growth public debt (-4,-1)	-3.235	0.959
	(3.644)	(1.551)
GDP Growth (-5,-1)	0.029***	0.013
	(0.012)	(0.012)
Growth public debt (-5,-1)	-7.318*	-0.644
	(4.300)	(1.688)

Distribution of Estimated Propensity Scores

Sources: Global Debt Database; and authors' calculations.

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Motivation → Data & Methodology → Results → Causality → Conclusions