

# **The Short- and Long-Run Effects of the 2007–09 Global Financial Crisis on Growth in Low-Income Countries**

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# Introduction

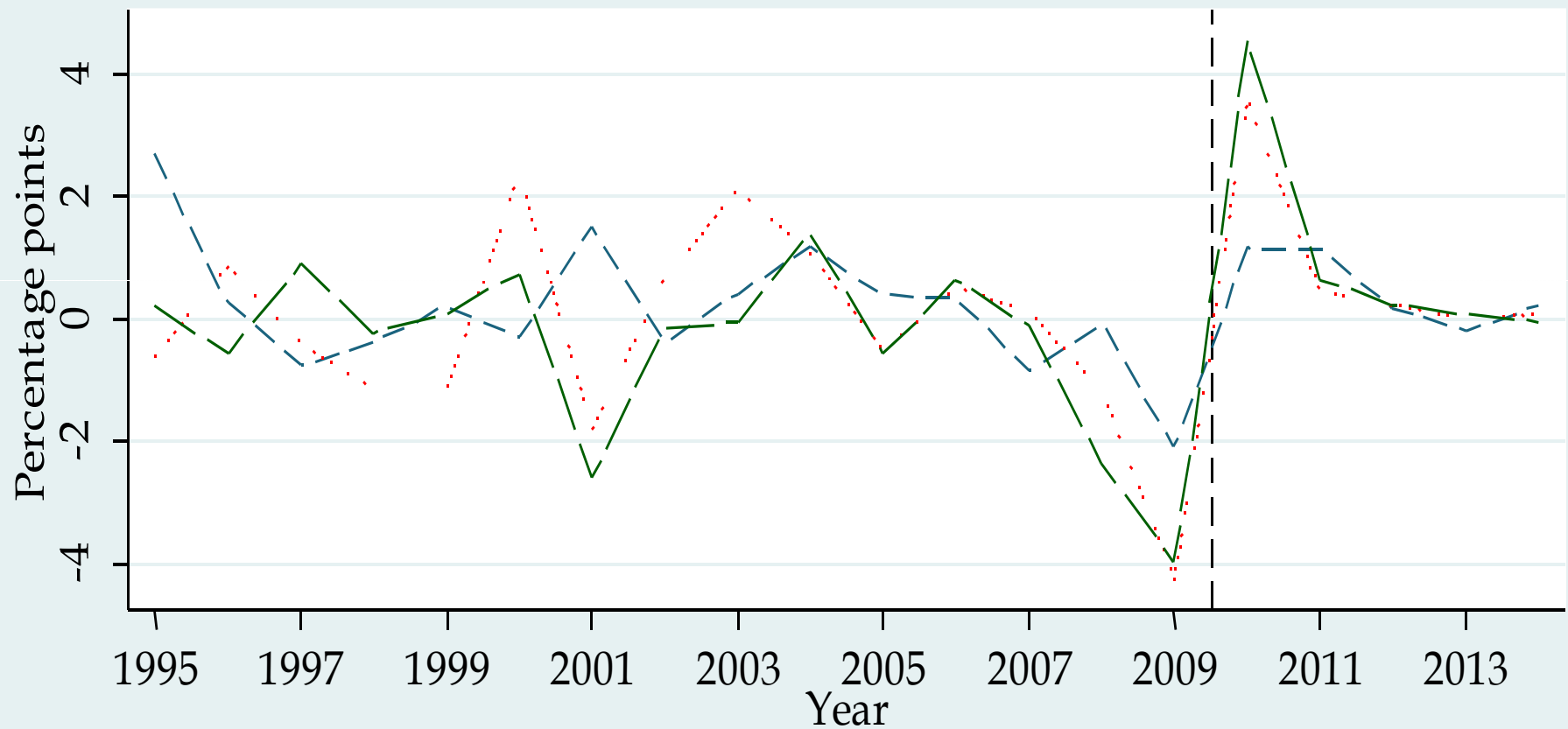
Key questions:

- ❑ How will crisis affect growth in Low-Income Countries (LIC) in the **short run**?
- ❑ How will crisis affect growth in LIC in the **medium to long run**?
- ❑ Are the effects different in the Middle-Income Countries (MIC)?
- ❑ How do the effects depend on policies and country characteristics?

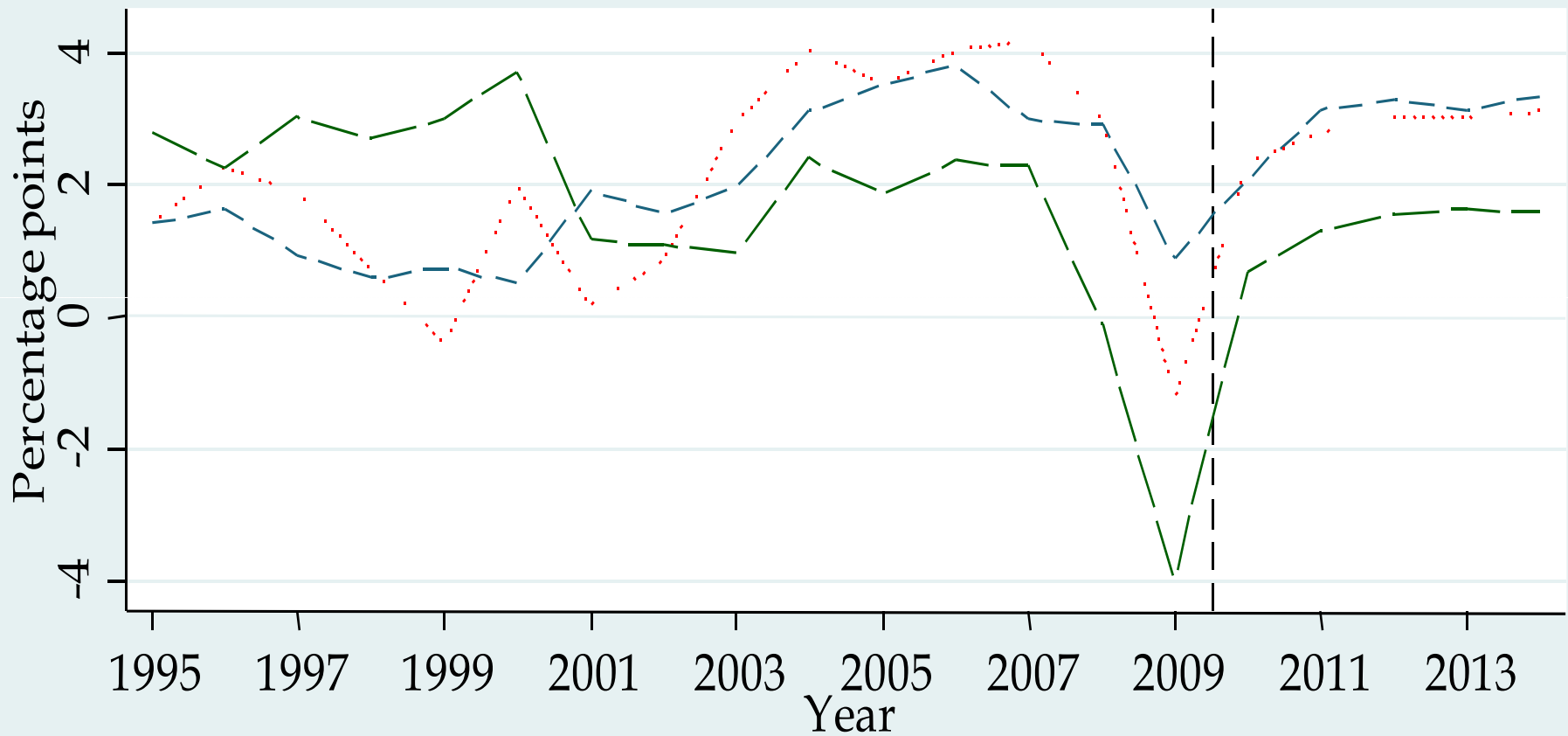
# Outline of Presentation

- ❑ A few **key facts** to keep in mind about the crisis
- ❑ What can we say about **cross-sectional outcomes** in 2009?
- ❑ Can we learn more from a **panel**, that is, using history as a guide to what happened in 2009 and what will happen in the future?
- ❑ **Medium-run growth**: should we fear more persistent output declines that cannot be captured by these approaches, given the historical frequency of structural breaks in the growth process?

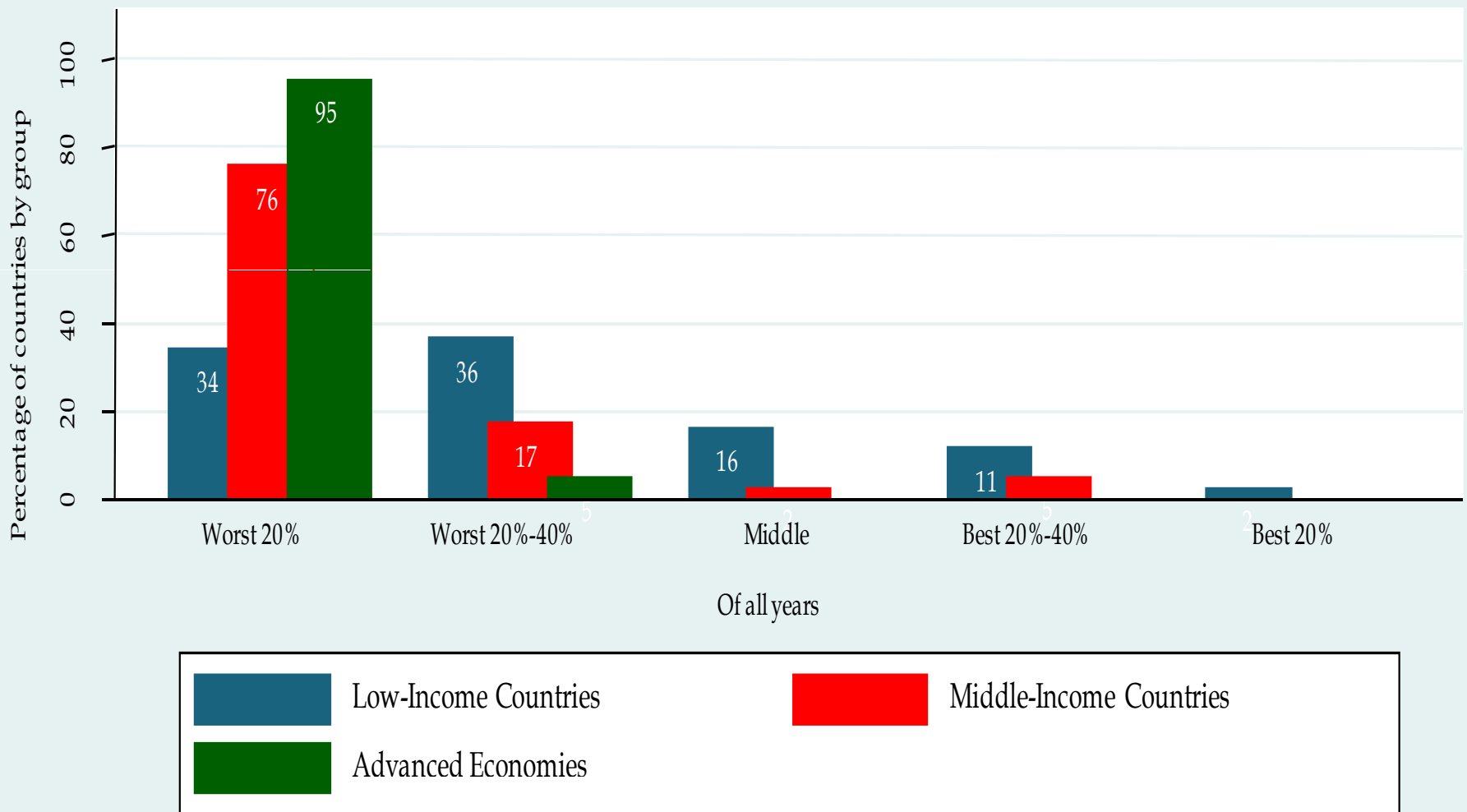
# Change in Output Growth Rate



# Output Growth Rate

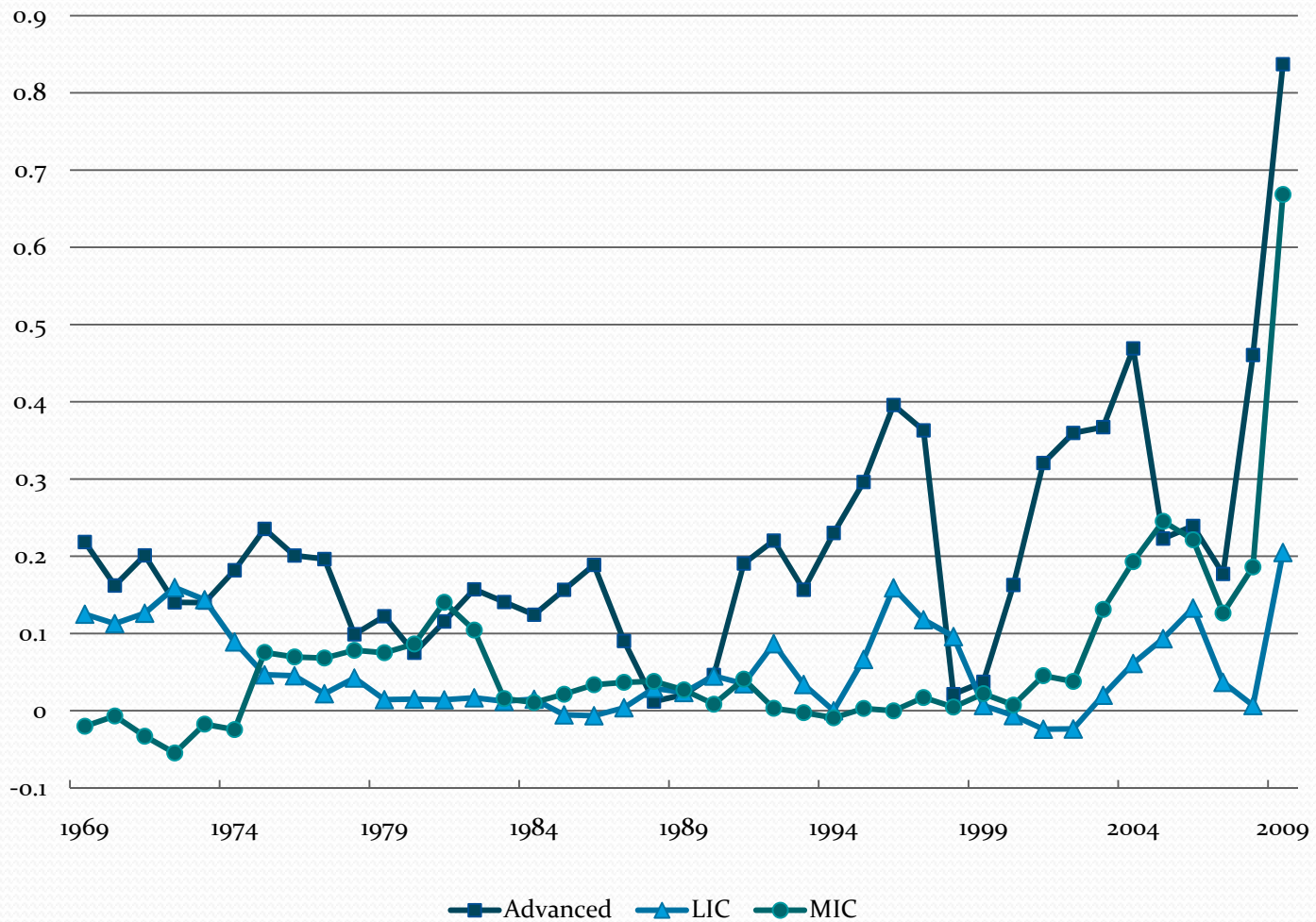


# Key Fact: Severity of 2009 Recession



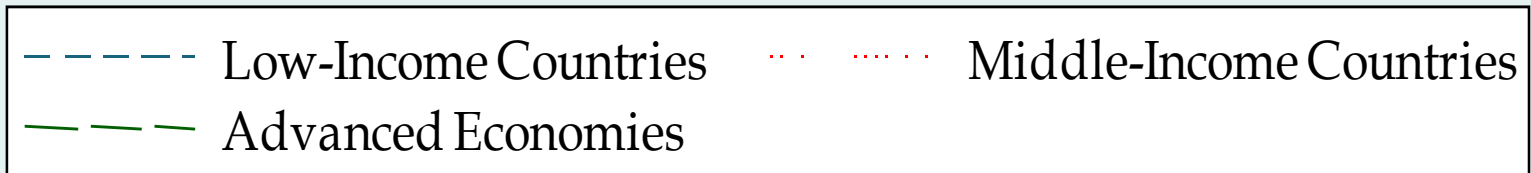
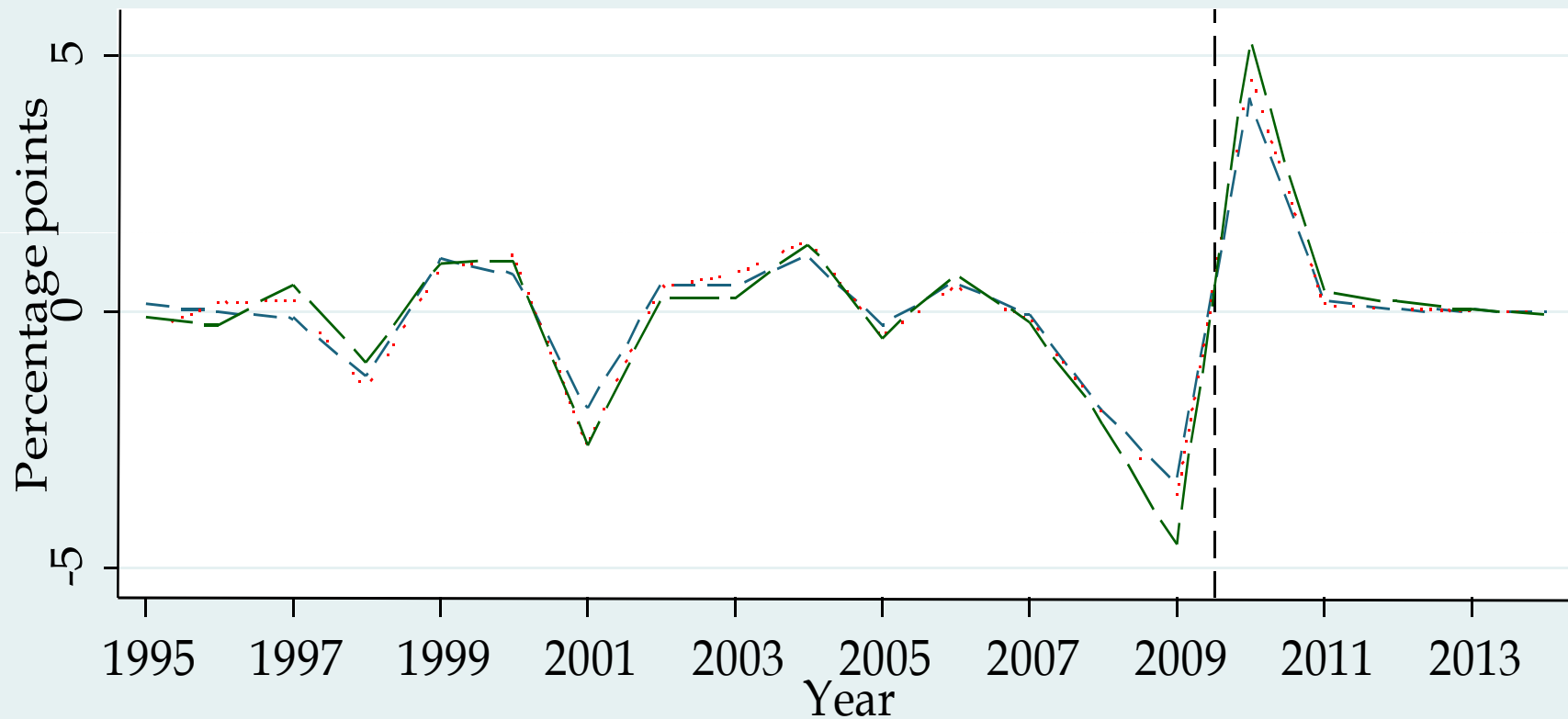
# Key Fact: Output Synchronization

Average Bilateral Correlations of Real GDP per Capita Growth



# Key Fact: Collapse in External Demand

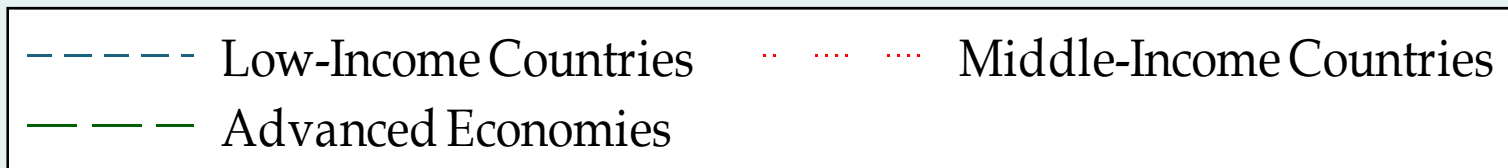
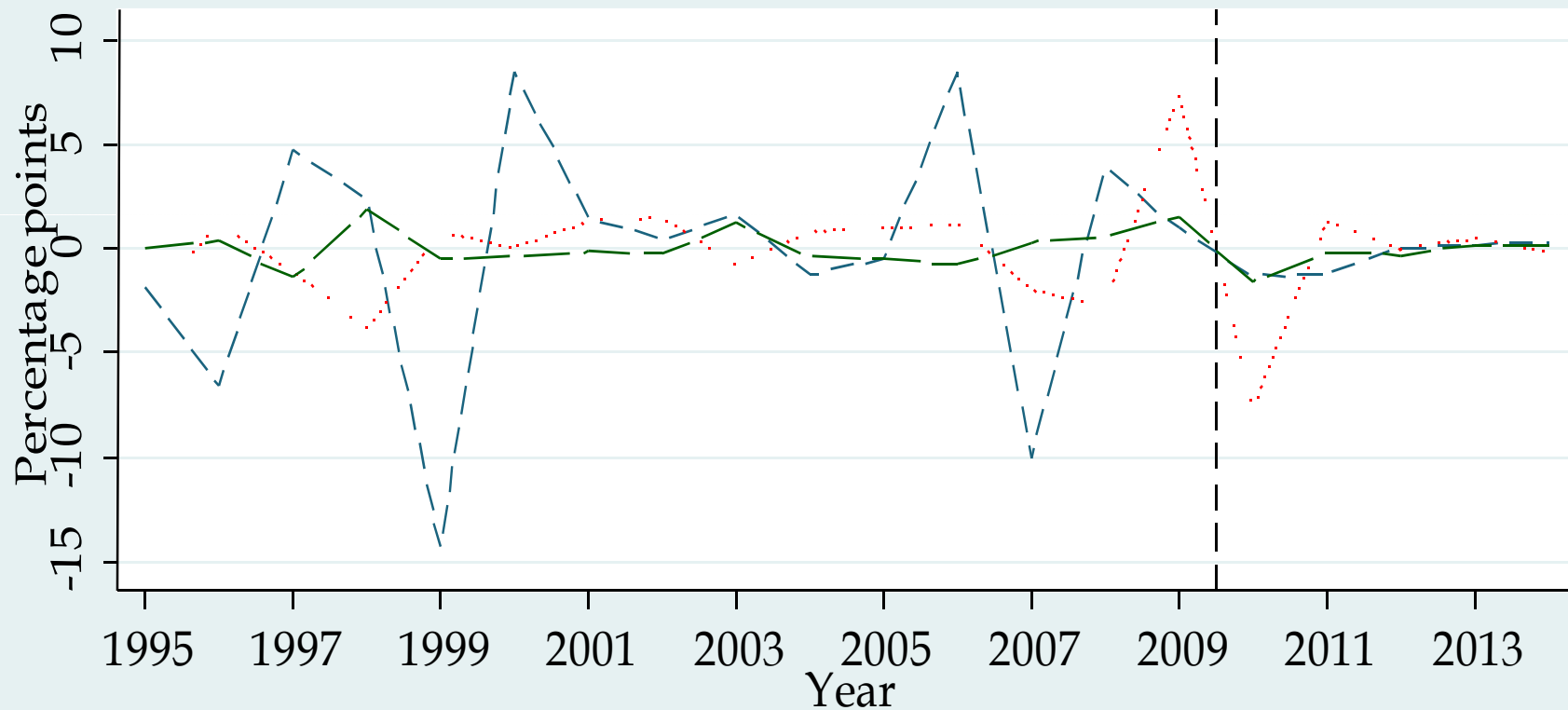
## Change in Growth Rate of External Demand



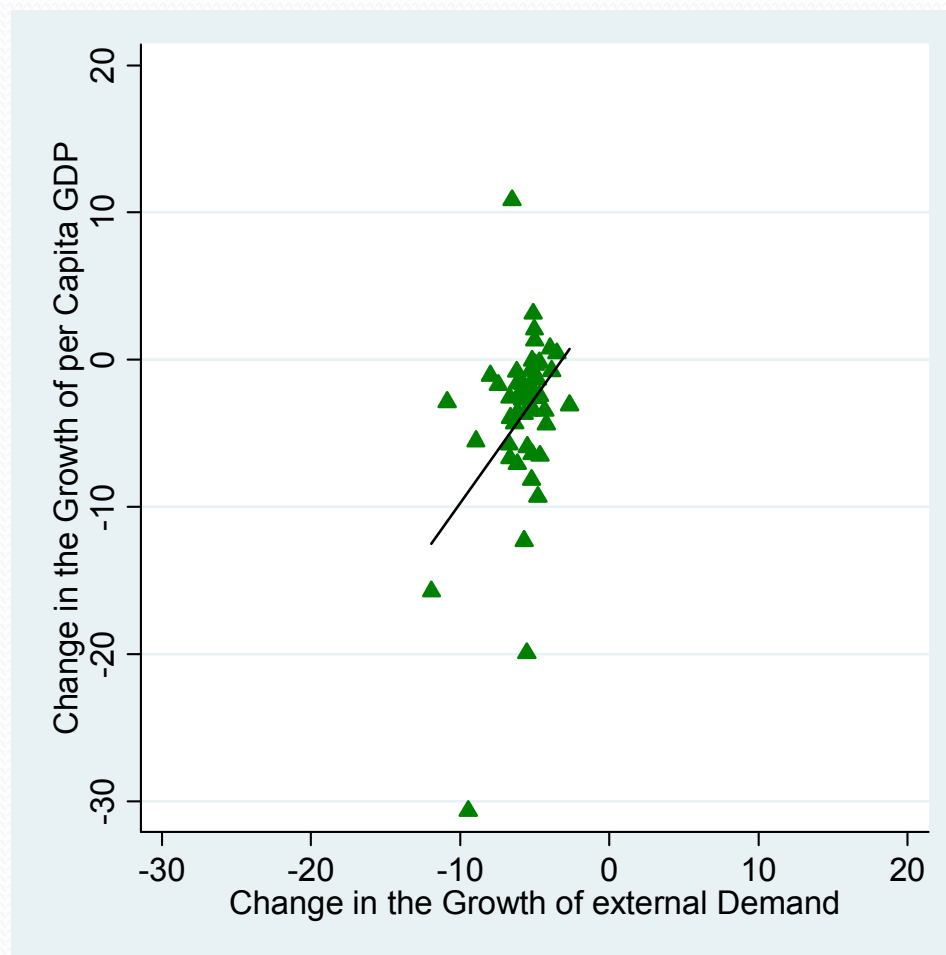


# Little Change in the Terms of Trade

Change in Growth Rate of Terms of Trade (non-fuel-exporters)



# Cross-Country Analysis: Output and External Demand, 2007-09



# Cross-Country Analysis: Output and Terms of Trade, 2007-09



# Cross-Country OLS Regression: Baseline

Regress decline in GDP growth on three key external shock variables (external demand, terms of trade, and FDI) and their lags, for a sample of 49 LIC.

## Key findings:

- ❑ A larger decline in external demand growth is significantly associated with a larger growth decline.
- ❑ A larger decline in FDI/GDP is significantly associated with a larger growth decline.
- ❑ No significant impact from changes in the terms of trade.

# Cross-Country Analysis: Role of Policy

Associated with smaller growth decline:

- ❑ Higher reserves / (short-term liabilities + current account deficit)

Associated with a larger growth decline:

- ❑ Larger credit boom in preceding years.
- ❑ **More flexible exchange rate regime.**
- ❑ Higher initial level of FDI.
- ❑ Higher per capita income.
- ❑ Smaller share of commodities exports in GDP.

Other variables (incl. initial fiscal balance, fiscal debt, current account balance, remittances, openness) not significantly associated with magnitude of growth decline.

# Panel Analysis

Next step: panel GMM regression, using annual data.

- ❑ **On Left-Hand Side: Output Growth Rate.**
- ❑ **On Right-Hand Side: Change in External Demand, in Terms of Trade, and in lagged FDI / GDP.**
- ❑ Other controls: country- and year-specific fixed effects; lagged output growth rate.

# Panel GMM Analysis: Baseline Specification for Output Growth

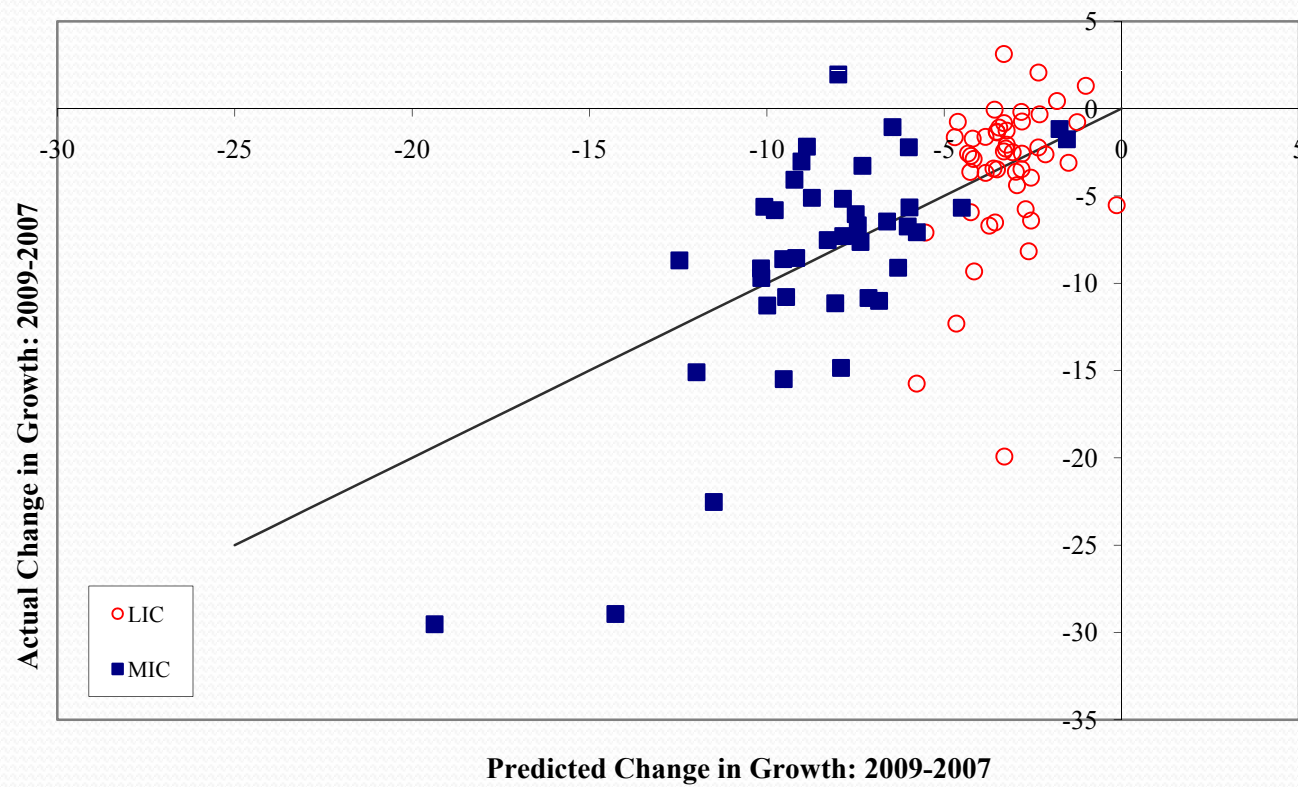
	All Non-Fuel-Exporters	LIC	MIC
Lagged Growth	0.246***	0.187**	0.376***
	(0.061)	(0.086)	(0.046)
Growth in Terms of Trade	0.017*	0.017*	0.026
	(0.009)	(0.009)	(0.030)
Growth in External Demand	0.681***	0.575***	0.894***
	(0.112)	(0.175)	(0.149)
Lagged Change in (FDI / GDP)	0.107***	0.024	0.141***
	(0.032)	(0.047)	(0.036)
Observations	1698	929	769
Number of Countries	89	49	40

Note: Regressions include a full set of country- and year-specific fixed effects. Robust standard errors in parentheses. \*\*\*, \*\*, and \* denote statistical significance at, respectively, the 1 percent, 5 percent, and 10 percent level.

# Panel Analysis:

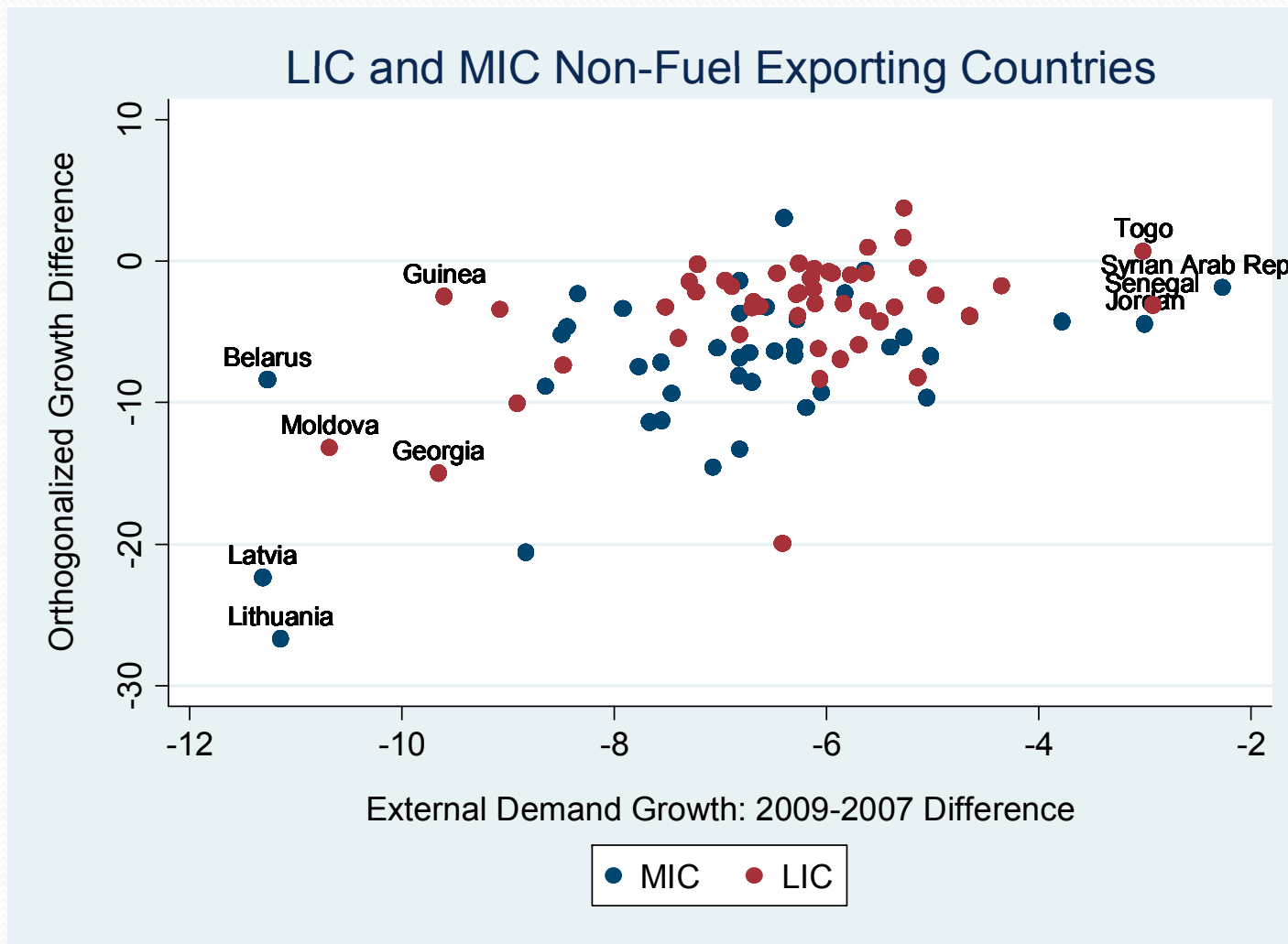
## Fitting the 2007-09 Output Decline

Actual vs. Predicted Change in Output Growth, 2007-09





# Panel Analysis: Growth and External Demand, 2007-09



# The Role of Policy

Examine the role of policy through alternative specifications, where impact of shocks to external demand, terms of trade, or capital flows is interacted with:

- ❑ Exchange Rate Regime
- ❑ Initial Reserve Levels
- ❑ Initial Deficits or Debt Levels
- ❑ Indicators of Structural Reform & Flexibility (external trade, labor & product markets, financial markets)
- ❑ Institutional Quality

So far, results inconclusive.

# Growth Forecasts: Average for 2010–2011, Relative to 2009 Growth

	<b>All Non–Fuel-Exporters</b>	<b>LIC</b>	<b>MIC</b>
<i>WEO</i> Forecast Mean Growth Difference	4.5	2.9	6.3
Model Forecast Mean Growth Difference	3.2	1.8	2.8
Mean Contribution of Change In:			
Lagged Growth	-0.2	-0.1	-0.4
Terms of Trade	0.0	0.0	0.0
External Demand	3.3	1.9	2.8
Lagged (FDI / GDP)	0.1	0.0	0.3

## Medium- to Long-Run Effects

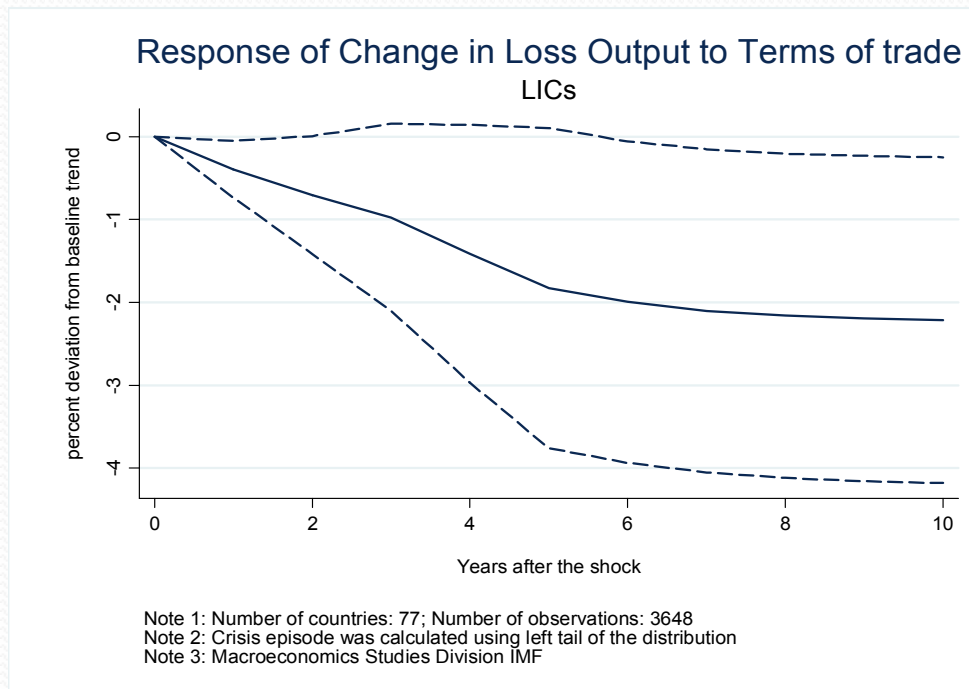
- ❑ Low-income countries as a group have enjoyed relatively rapid growth in recent years. Since 1995, for example, sub-Saharan Africa has grown faster than developed countries, after many years of poor average performance.
- ❑ If the current shock has longer-run implications (that is, if it knocks countries off a track of solid medium-long-term growth), then it will be a much greater disaster.

# History Has Not Been Kind

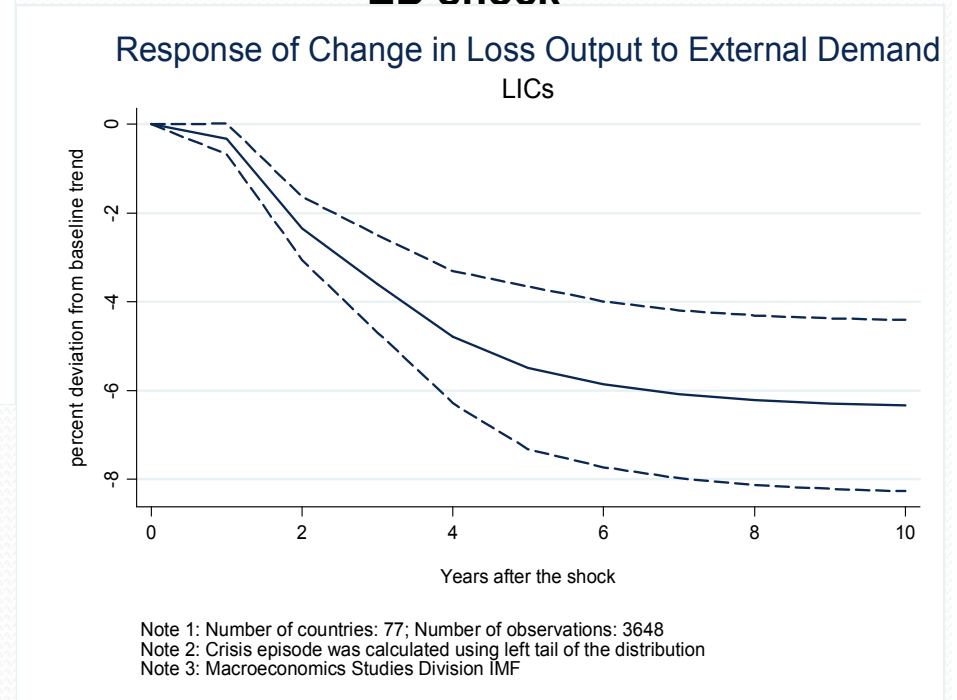
- ❑ In principle, a temporary negative shock to external demand or the terms of trade in a standard neoclassical growth model would be followed by a reasonably quick reversion.
- ❑ However, history is not optimistic that LIC can uniformly escape global shocks without absorbing long-lasting damages both on growth and welfare.
- ❑ There is also an emerging empirical literature that points to growth nonlinearities, growth accelerations, and growth decelerations.
- ❑ So, important to consider not only the short-run implications of the crisis and policy responses, but also the risks to medium-run growth and how to sustain it.

# 1. Impulse Response: We employ impulse response function analysis as in Cerra and Saxena (2008)

## Impulse response of output loss in LIC to TOT shock



## Impulse response of output loss in LIC to ED shock



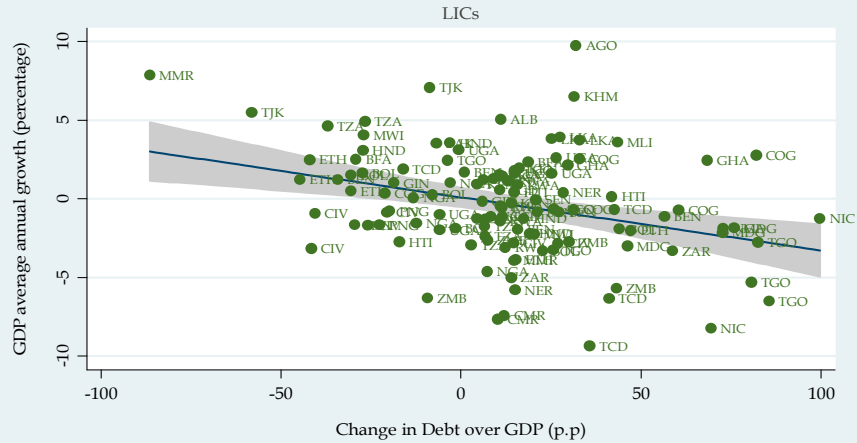
## 2. Growth regressions: A second exercise employs 5-year panel growth regressions as an alternative approach to investigating the impact of TOT, ED and FDI shocks on medium-term per capita GDP growth.

$$\text{GDP(growth)} = a_0 + a_1 \text{lagGDP(growth)} + a_2 \text{TOT} + a_3 \text{ED} + a_4 \text{FDI} + \eta$$

Panel GMM w/ time effects									
VARIABLES	Entire Time Period			Before 1990			After 1990		
	All	PRGF-NF	NPRGF-NF	All	PRGF-NF	NPRGF-NF	All	PRGF-NF	NPRGF-NF
Lagged Growth	-0.209*** (0.066)	-0.167** (0.077)	-0.237** (0.095)	-0.577*** (0.092)	-0.487*** (0.096)	-0.662*** (0.110)	-0.292*** (0.063)	-0.287*** (0.080)	-0.261*** (0.083)
Growth in Terms of Trade	0.123*** (0.047)	0.115* (0.064)	0.111** (0.053)	0.031 (0.028)	0.030 (0.046)	0.023 (0.028)	0.156** (0.063)	0.131* (0.077)	0.182*** (0.066)
Growth in External Demand	2.603*** (0.606)	1.960*** (0.736)	3.419*** (0.786)	1.332** (0.609)	0.617 (0.599)	2.599** (1.135)	1.727*** (0.666)	1.665* (0.938)	1.769** (0.706)
Lagged Change in (FDI / GDP)	0.631*** (0.187)	0.221 (0.222)	1.010*** (0.270)	0.599 (0.633)	-0.404 (0.732)	1.773*** (0.528)	0.783*** (0.243)	0.517* (0.305)	0.953*** (0.319)
Observations	529	281	248	181	92	89	348	189	159
Number of country_code	88	48	40	86	47	39	88	48	40
Robust standard errors in parentheses									
*** p<0.01, ** p<0.05, * p<0.1									

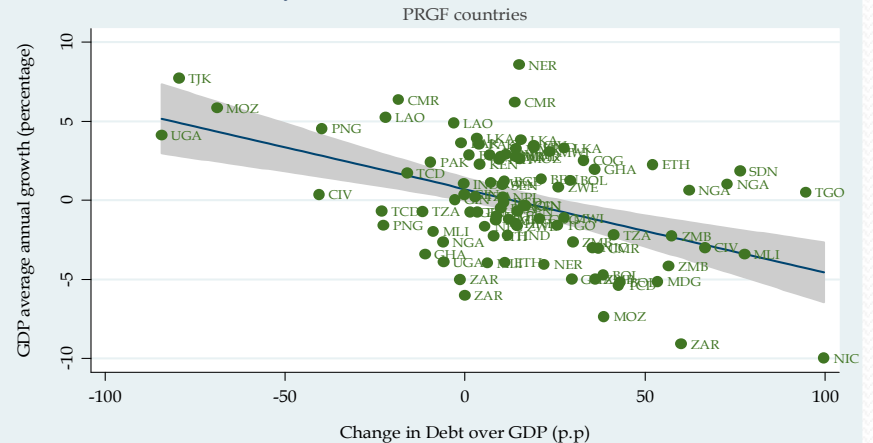
# 3b. Pre-crisis debt, and exchange rate regime vs. post-crisis growth

Change in debt over GDP and GDP average annual growth, 5 years before and after Terms-of-Trade shock



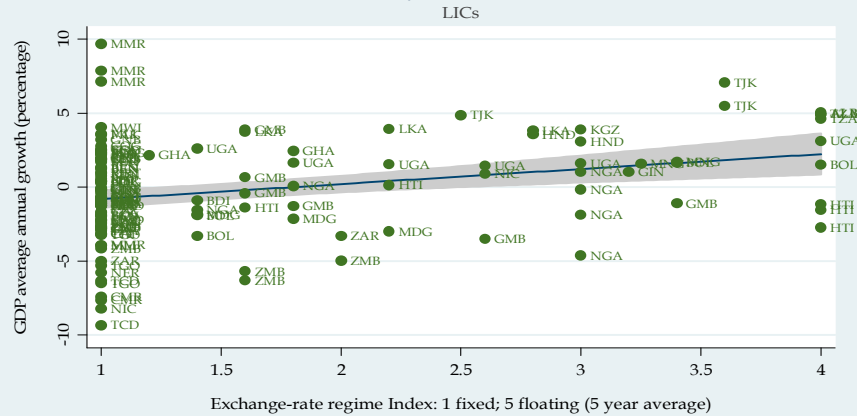
95% Confidence interval      Fitted values

Change in debt over GDP and GDP average annual growth, 5 years after External demand shock



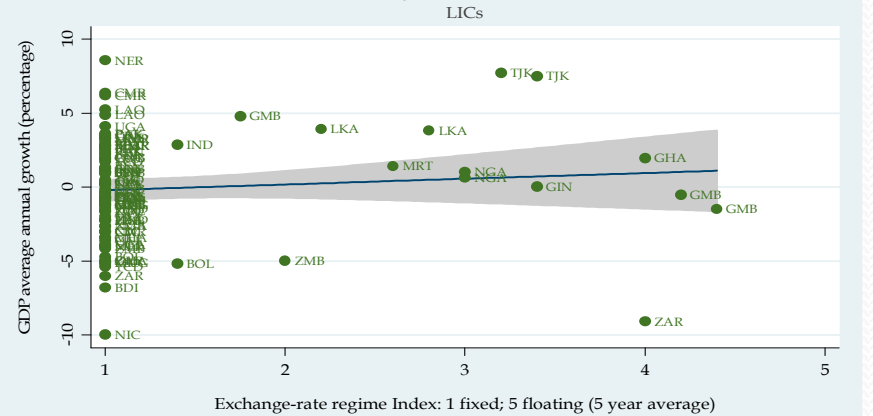
95% Confidence interval      Fitted values

Exchange-rate regime and GDP average annual growth before and after 5 years Terms-of-Trade shock



95% Confidence interval      Fitted values

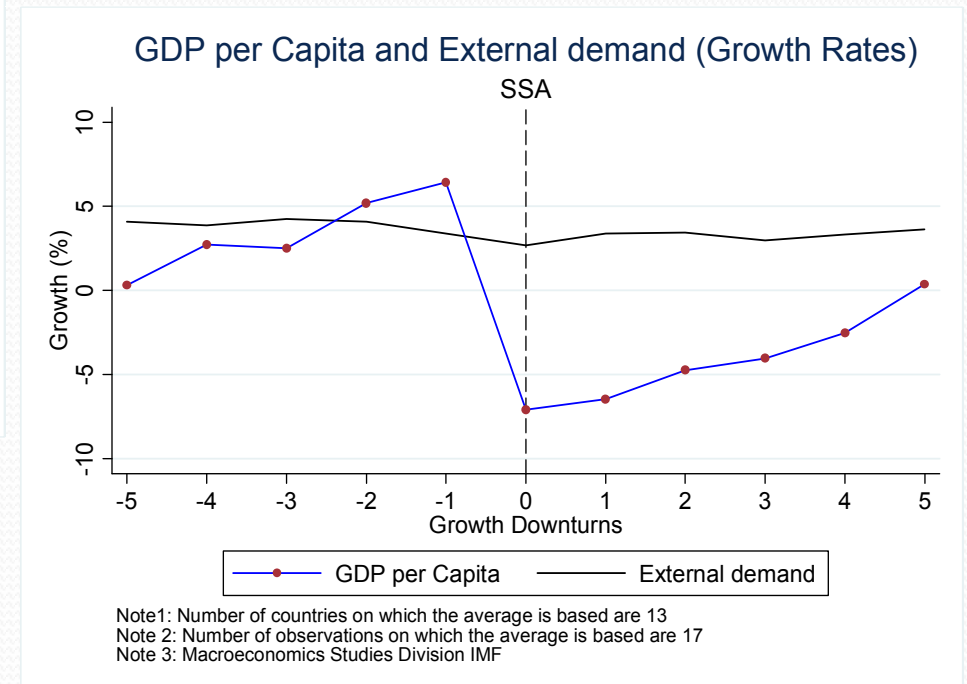
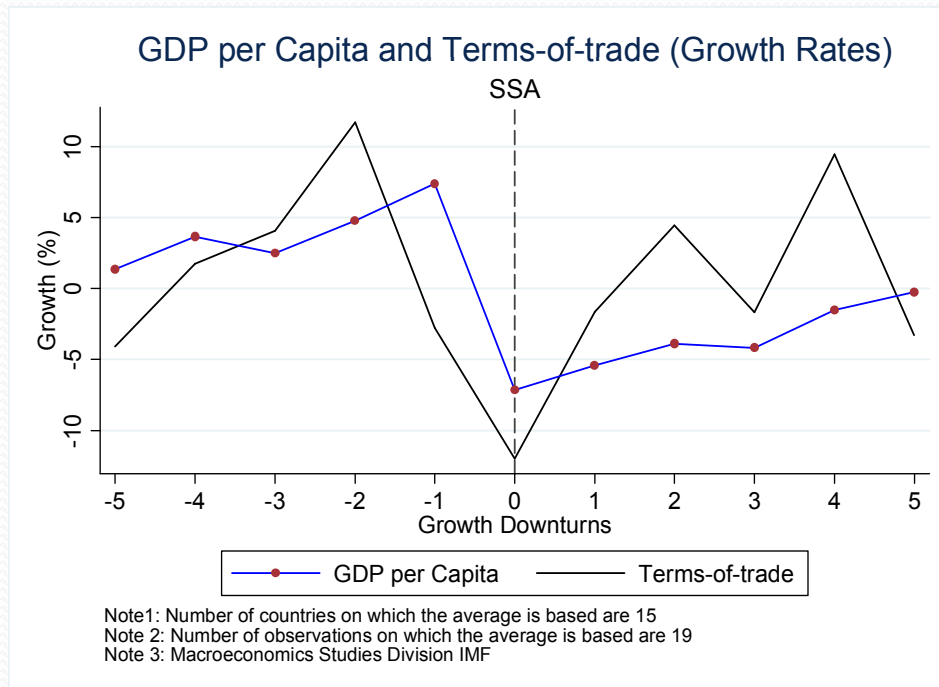
Exchange-rate regime and GDP average annual growth before and after 5 years External demand shock



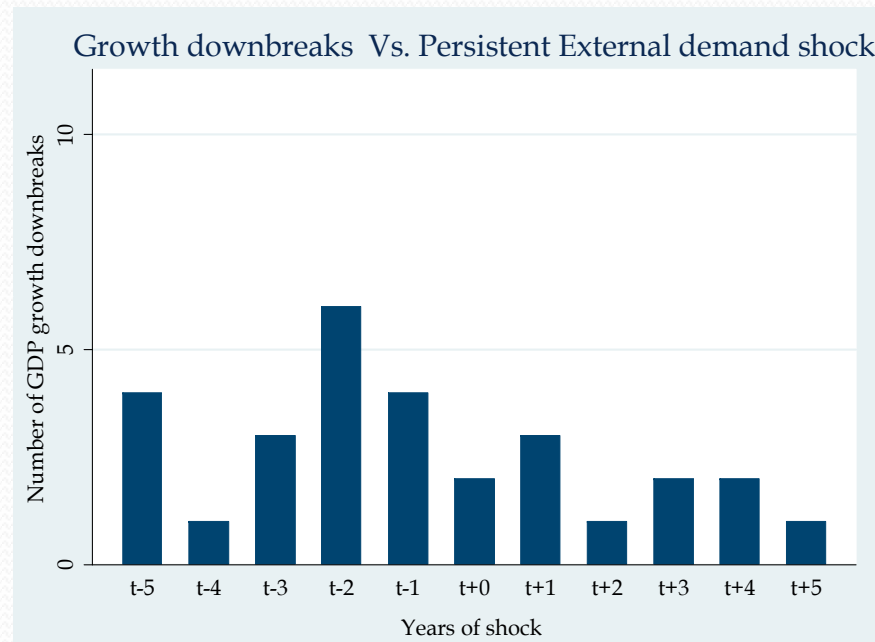
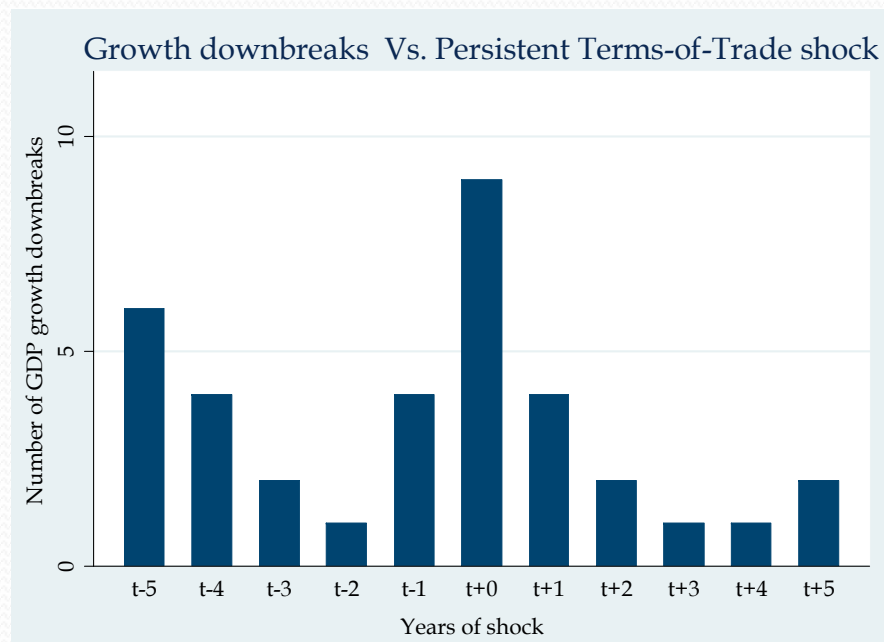
95% Confidence interval      Fitted values



### 3a. Growth breaks: Use Berg, Ostry and Zettelmeyer (2010) to identify growth decelerations (sustained periods of slow growth) in LIC, and trace TOT and ED shocks before and after.



### 3b. Growth breaks: GDP growth decelerations (sustained periods of slow growth) vs. large permanent TOT and ED shocks.



Source: IMF staff calculations.

Note: The left panel plots the number of GDP growth downturns in a large sample of low-income countries (excluding transition economies) during the periods leading up to, and following, a large persistent terms of trade shock (year  $t+0$  on the horizontal axis). A large persistent TOT shock is defined as the worst 10 percent of the distribution of all TOT shocks, measured as the difference of the average 3 year TOT growth before and after period  $t$ . The right panel is the same, except that the shock is to external demand, measured as partner country real growth weighted by export shares.



## Message from MR-LR analysis

- ❑ Since the current crisis affected LIC primarily through a shock to External Demand rather than the Terms of Trade ...
- ❑ ... this implies a low probability that many LIC will see an end to the period of strong growth they enjoyed prior to the crisis.
- ❑ Still, shocks to External Demand are often associated with persistent output losses ...
- ❑ ... which highlights the need for vigilance and prudent policy to protect pre-crisis growth trends.



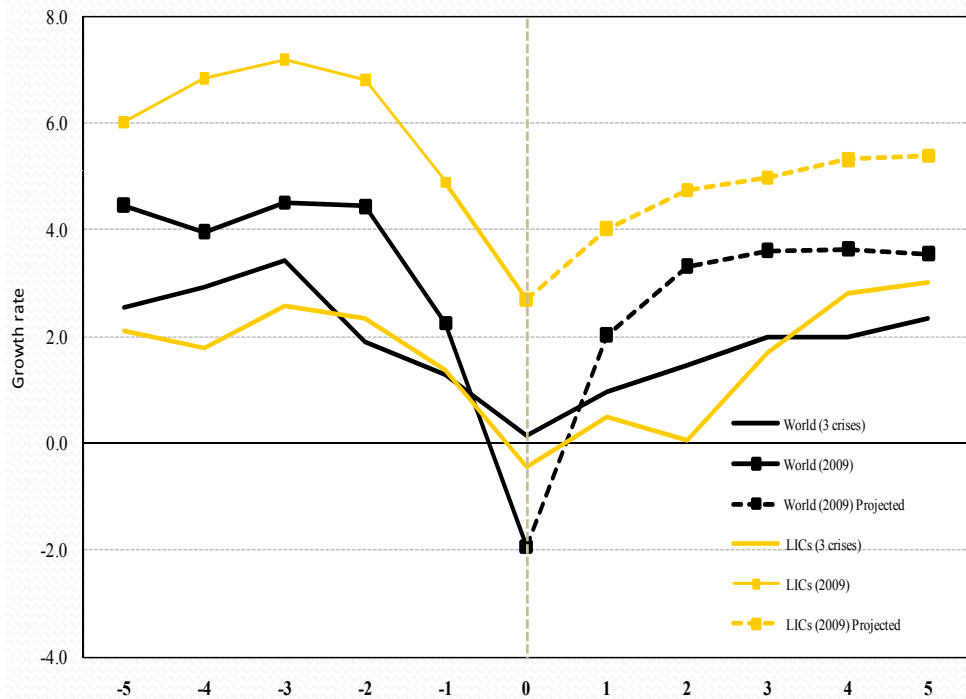
**Thank You**

# Cross-Country OLS. LHS: change in per capita GDP growth, 2009 vs. 2007

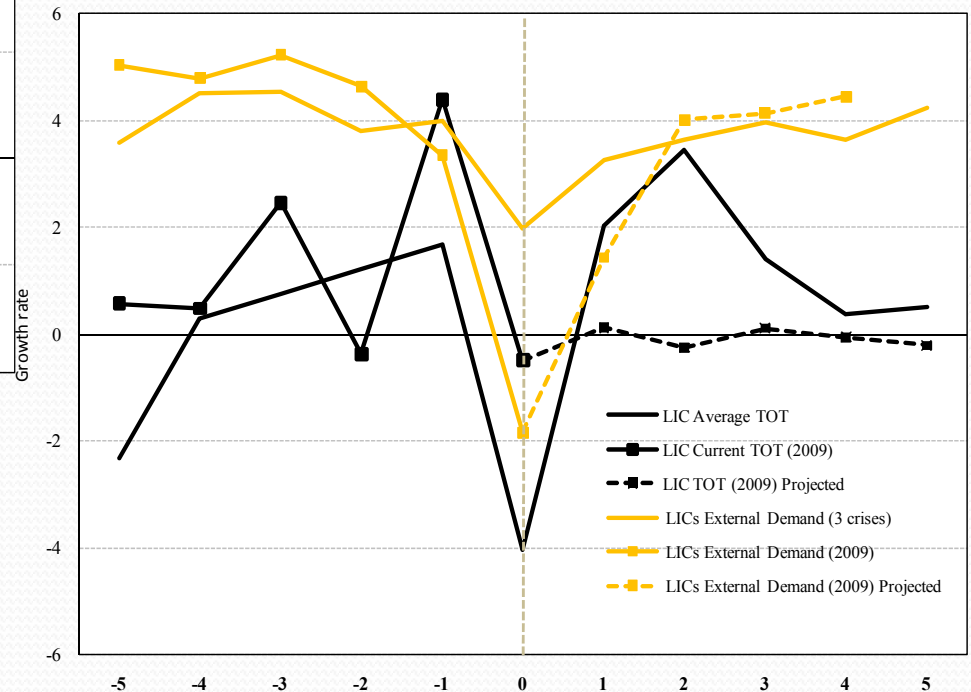
Variable	Coefficient	Interpretation
Lag change in real per capita growth (2007- 05)	-0.19	
Change in (terms of trade growth * trade/GDP) (2009-07)	-0.01	
Lag change in (terms of trade growth * trade/GDP) (2009-07)	-0.01	
Change in (external demand growth * exports/GDP) (2009-07)	1.67**	<b>Larger decline in external demand growth associated with larger growth decline</b>
Lag change in (external demand growth * exports/GDP) (2009-07)	1.47	
Change in FDI/GDP (2009-2007)	0.37*	<b>Larger decline in FDI/GDP associated with larger growth decline</b>
Lag change in FDI/GDP (2007-2005)	-0.12	

# Past and Current Global Crises: Effects on World and LIC

## GDP per capita growth in past and current crises



## TOT and ED growth in LIC in past and current crises



### DEBT CRISES

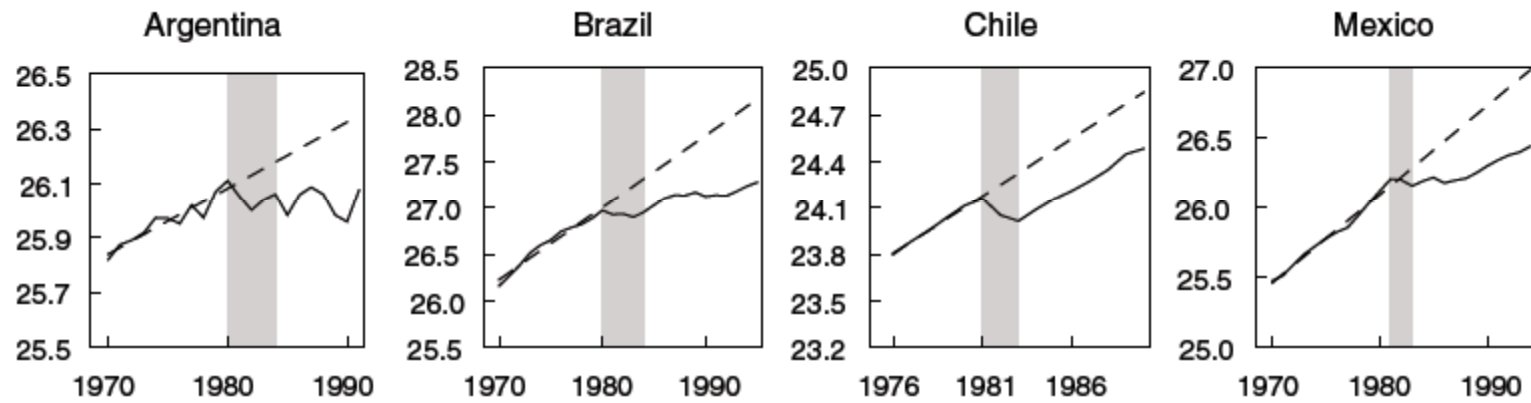


FIGURE 1

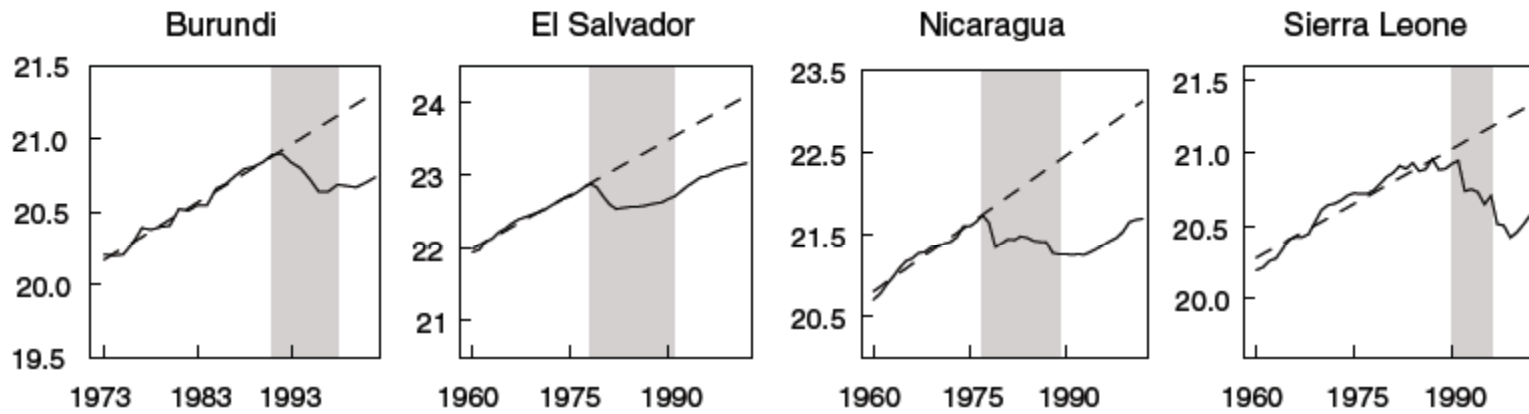



FIGURE 2. PROTRACTED CIVIL WARS



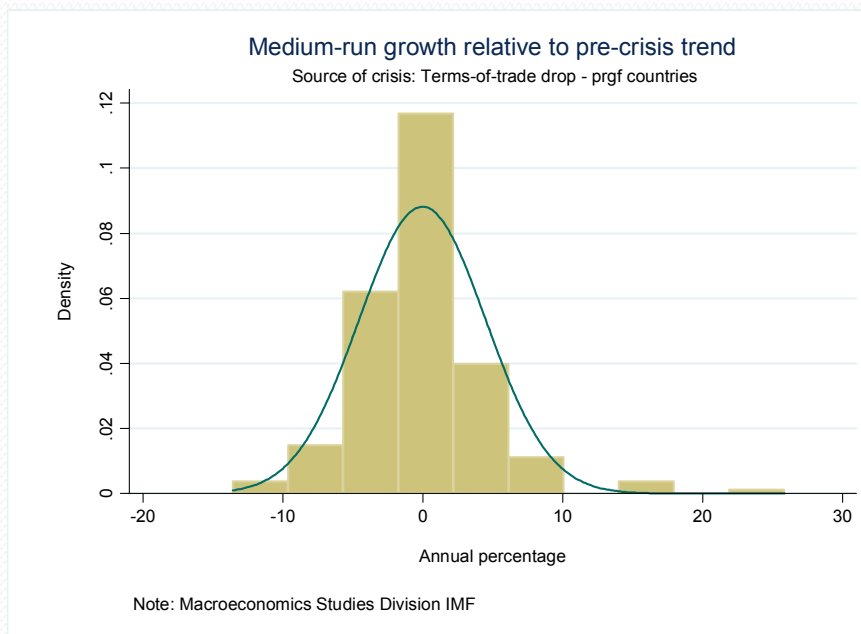
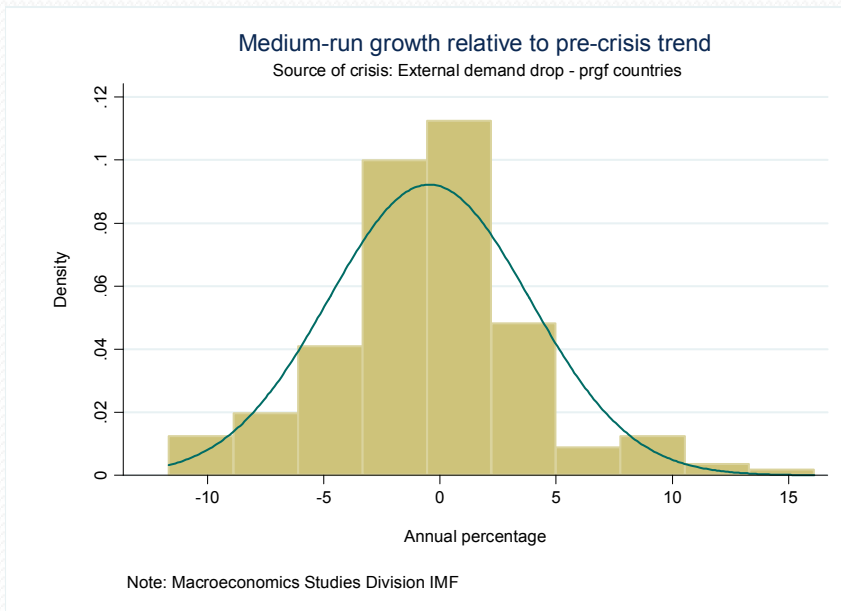
and Charles Plosser 1982) and for serial correlation in growth rates.<sup>1</sup> We control for country fixed effects, which *F*-tests indicate are present.<sup>2</sup> We estimate an AR(4), as we find insignificant coefficients beyond the fourth lag. We estimate the model on all of the available data from 190 countries over the period 1960 through 2001. We then extend the estimation equation to include the current and lagged impacts of the shock. Thus, we estimate the following model:

$$(1) \quad g_{it} = a_i + \sum_{j=1}^4 \beta_j g_{i,t-j} + \sum_{s=0}^4 \delta_s D_{i,t-s} + \varepsilon_{it},$$

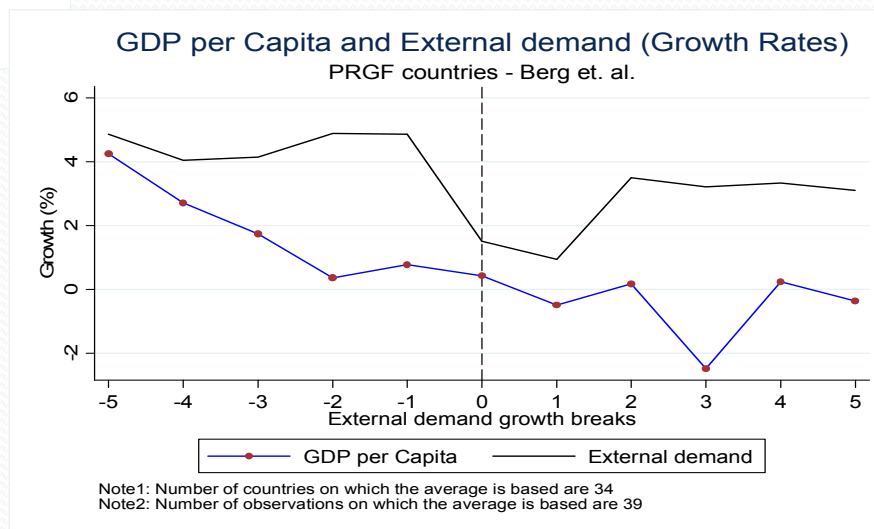
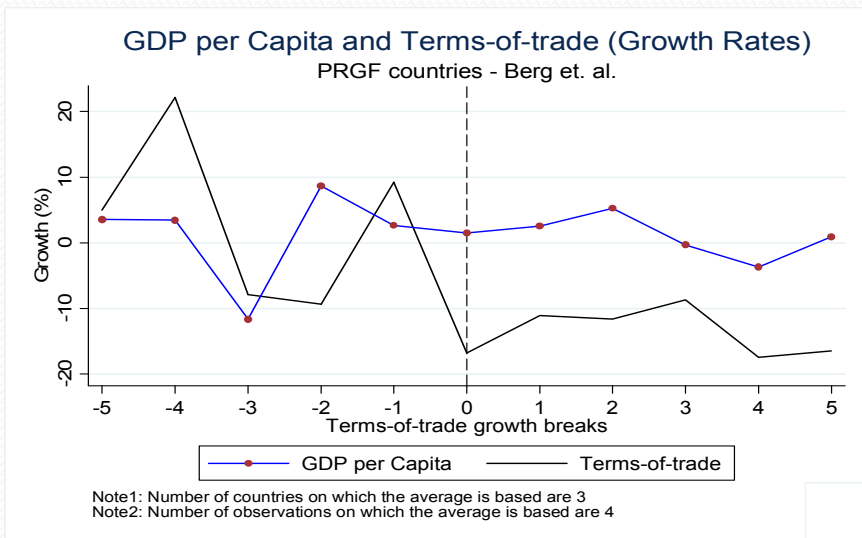
where *g* is the percentage change in real GDP and *D* is a dummy variable indicating a financial or political crisis. The impulse response functions to each crisis type are shown with a one-standard-error band drawn from a thousand Monte Carlo simulations.



Figure A1: Histograms showing annual growth 5 years after the shock



# Figure A2: Growth around periods TOT and ED growth decelerations





Thank You