Do Credit Shocks Matter? A Global Perspective

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Main Questions and Results

- Do Credit Shocks Drive the Global Business Cycle?
  - ▶ We study the period 1988:1-2009:4
  - ▶ Over the full sample credit shocks matter, but to a modest extent
  - ▶ In the recent crisis credit shocks are a main driver of global GDP
  - ▶ In contrast, global credit shocks mattered little in the 1991, 2001 recessions
- Do US credit shocks transmit to the world?
  - ▶ In the recent crisis, yes, in earlier periods, no

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Our Approach

- We estimate common factors to a number of key macro variables in the G7
  - Macroeconomic Aggregates of Interest: GDP, Inflation
  - Potential 'Source' Variables: Interest rates, Credit, Credit Spreads, Productivity
  - Estimated Common Factors are placed in a Global VAR
- We then identify a number of shocks that may drive the global cycle
  - Productivity, Credit, Monetary, Demand
  - Each shock is identified with sign restrictions
  - We examine IRFs, Variance Decompositions, and Counterfactual Simulations
- We then estimate a VAR on US data with the Global GDP factor
  - We identify the same shocks
 - We study how US shocks transmit to the world

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Data

- Quarterly data for the G7, 1988:1-2009:4
- Credit: Aggregate Claims on Private Sector
- Credit is deflated by CPI
- US Corporate Bond Spread: Aaa-Baa
- GDP, CPI Inflation, Short Term Treasury Rates
- Productivity: Real GDP per Hours Worked

Constructing a Global VAR

- We will use common factors as estimates of Global measures of GDP, credit etc.
- Factors are estimated with principal components
- Exact factor analysis as in Kose, Otrok and Whiteman (2003) is an alternative
  - ▶ Their approach is most useful in multifactor settings
  - ▶ In a one factor model the estimated factors are very similar
  - ▶ Principal components is easier

G7 GDP Factor
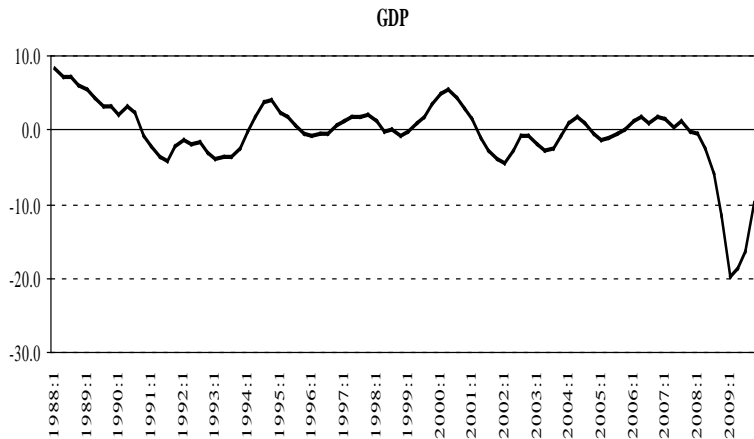
Credit Factor and Credit Spread
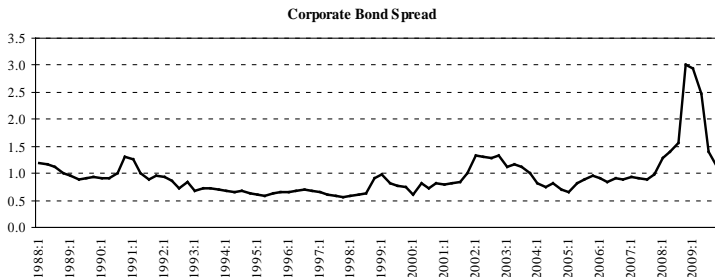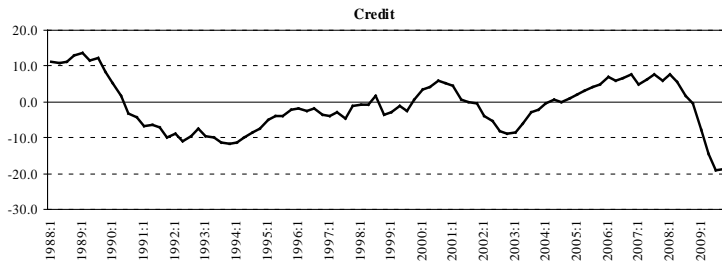
Sign Restrictions

- Restrict Impulses reponse functions of some variables using theory
- Less restrictive and more intuitive than informational orderings
- Start with the idea that there are many possible statistically valid mappings between the reduced form and structural VAR
- We then draw a 'candidate' IRF from this large set
- If the candidate meets our IRF restrictions we retain the draw

Sign Restrictions

- Credit Shocks
    - ▶ decrease in credit, rise in credit spread
- Productivity Shocks
    - ▶ Rise in productivity, rise in GDP, fall in inflation
- Demand Shocks
    - ▶ Increase in inflation and GDP
- Policy Shocks
    - ▶ rise in interest rates, fall in inflation, GDP
    - ▶ credit spreads do not rise
- All restrictions are imposed for 4 quarters, then the IRFs are unconstrained

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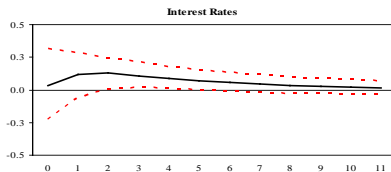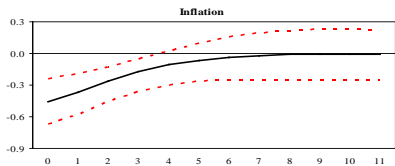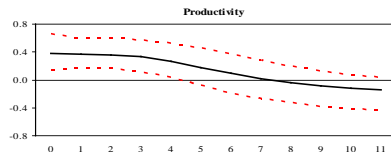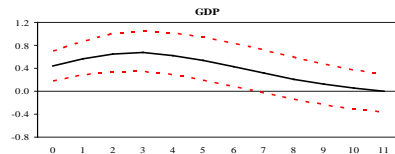- All restrictions are imposed for 4 quarters, then the IRFs are unconstrained

Credit Shocks in Global VAR
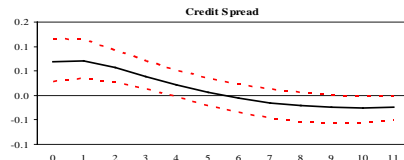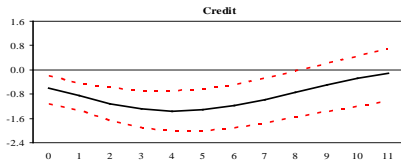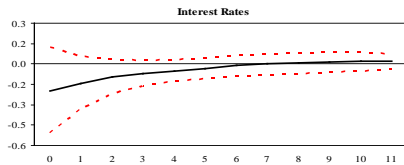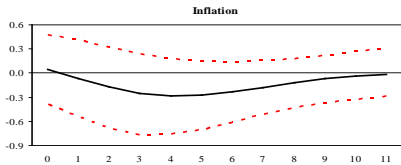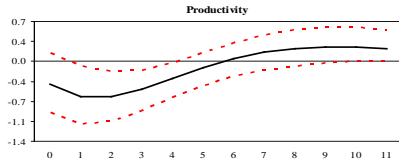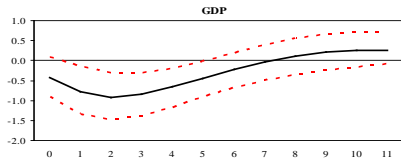
Demand Shocks in Global VAR
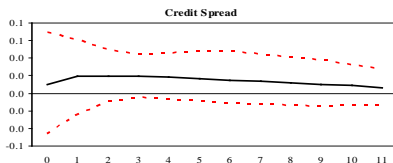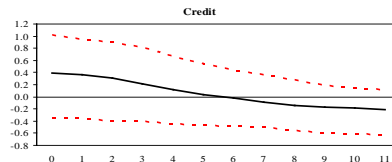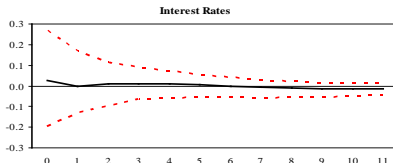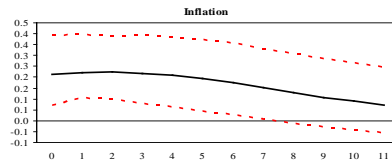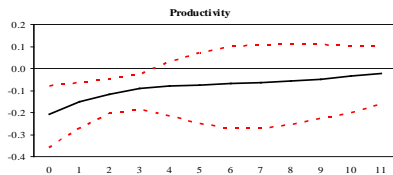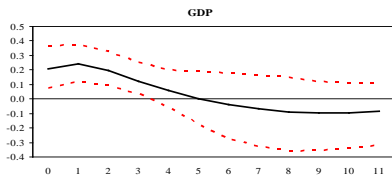
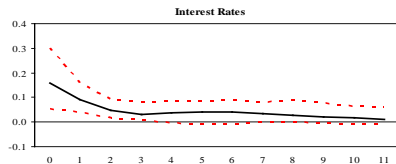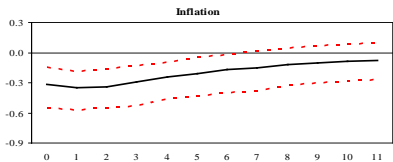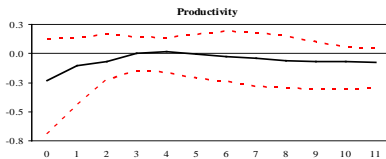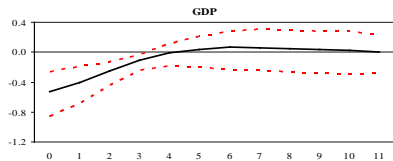## Productivity Shocks in Global VAR
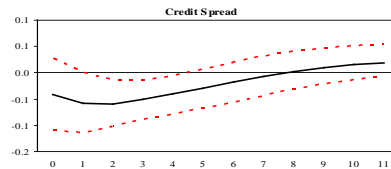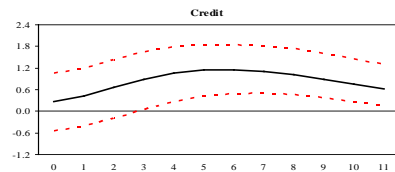
Policy Shocks in Global VAR
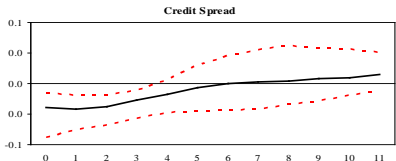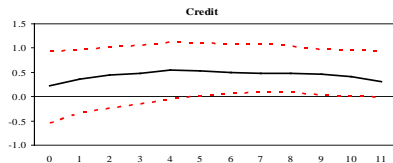
4 Shocks in the Global VAR

		Variables					
Shocks	Forecast horiozon (in quarters)	GDP	Productivity	Inflation	Interest Rates	Credit	Credit Sread
Credit	1	12.1	9.8	10.6	12.3	9.4	13.8
	4	12.6	11.3	13.3	13.2	14.6	14.0
	8	13.6	12.3	15.5	14.3	15.7	14.6
	12	13.6	12.5	15.9	14.8	15.8	15.7
Labor Productivity	1	11.8	9.5	10.4	15.9	10.2	15.5
	4	12.6	10.5	12.2	15.7	13.2	15.6
	8	13.4	11.2	12.9	15.6	14.7	15.4
	12	13.4	11.6	13.3	15.7	14.7	15.3
Policy	1	8.4	6.1	26.6	9.7	11.8	9.9
	4	9.0	7.5	21.5	10.0	13.7	10.2
	8	10.8	8.9	17.3	11.8	15.9	12.1
	12	11.9	9.8	15.9	12.5	17.3	13.1
Demand	1	9.1	1.4	13.0	8.6	9.8	6.2
	4	9.2	2.8	10.4	9.2	10.7	6.7
	8	10.1	4.4	9.4	10.1	11.7	7.7
	12	10.4	5.4	9.6	10.3	12.6	8.4

Credit Shocks and Global GDP: Recent Crisis

2007-2009
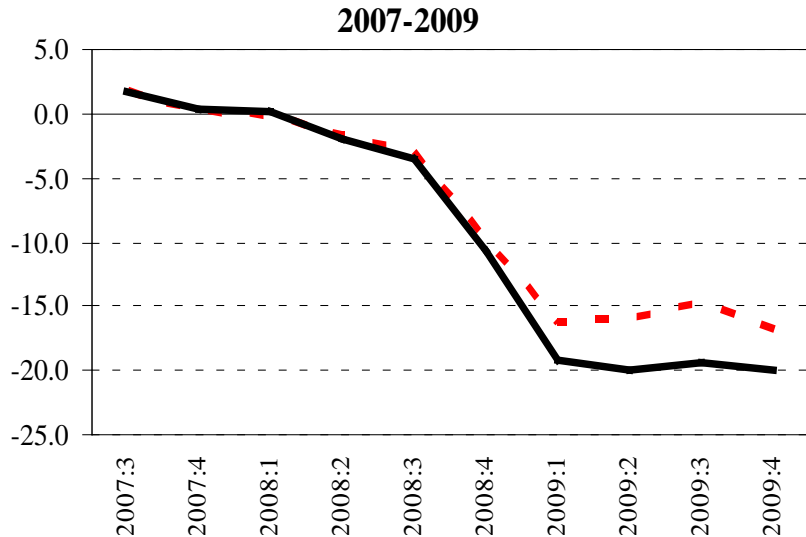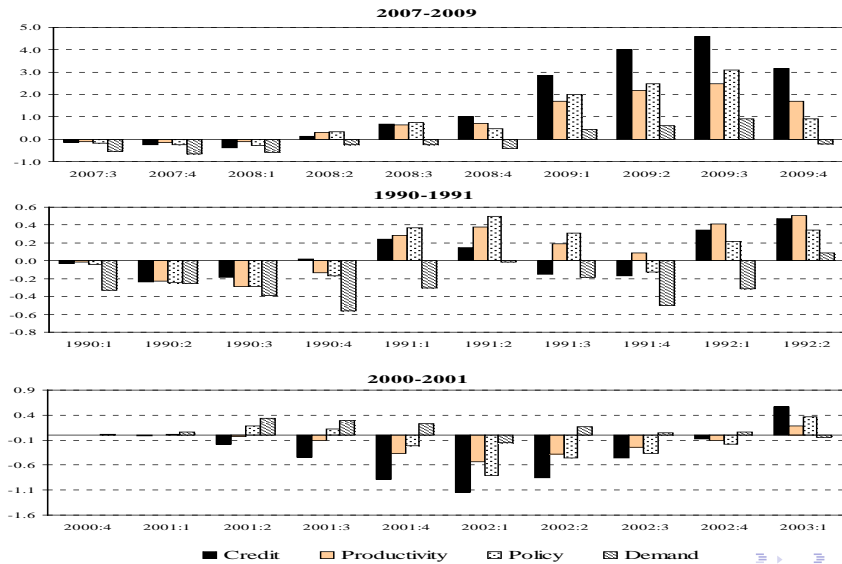
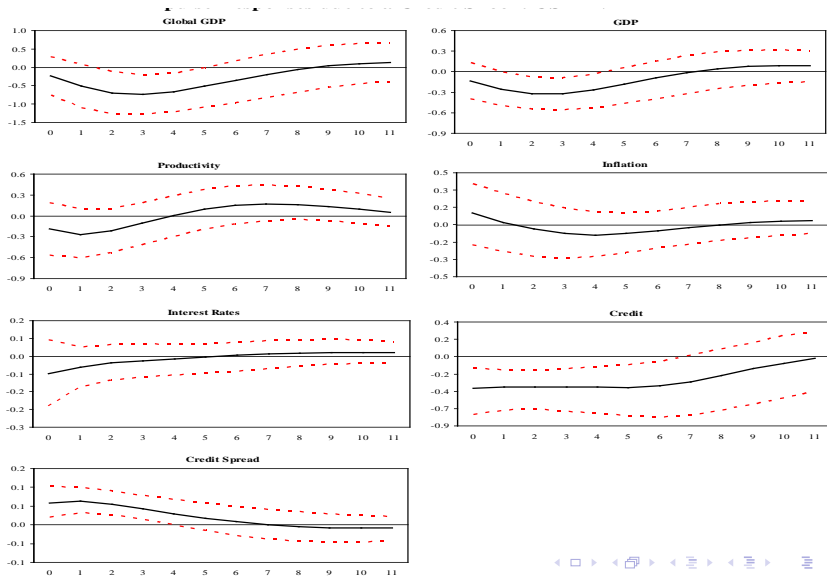Credit Shocks and Global GDP: Previous Episodes
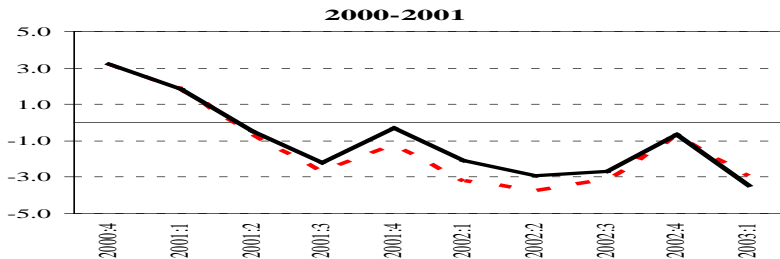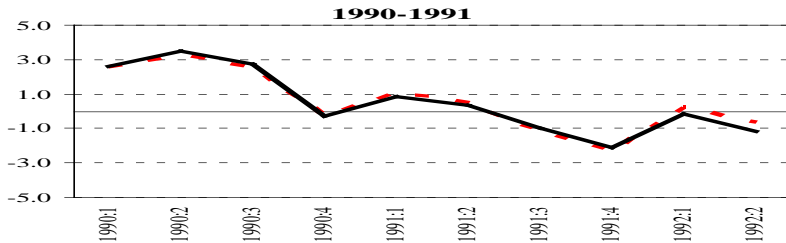
All Shocks and Global GDP: Recent Crisis

Do US Credit Shocks Transmit to the Rest of the World?

- VAR with US data + Global GDP Factor = FAVAR
- Do Credit Shocks that originate in the US propagate to the world?
- Same sign restrictions as before

Credit Shock in US FAVAR

4 Shocks in the US FAVAR

Shocks	Forecast horiozon (in quarters)	Variables						
		Global GDP	GDP	Productivity	Inflation	Interest Rates	Credit	Credit Spread
Credit	1	10.3	8.1	8.4	8.5	10.1	9.8	10.6
	4	12.4	10.5	9.8	9.9	10.4	11.9	10.7
	8	13.3	12.4	11.5	11.9	11.4	13.7	11.9
	12	13.3	12.9	12.3	12.5	12.1	14.1	12.3
Labor Productivity	1	11.5	16.6	6.6	7.2	11.1	8.9	12.8
	4	12.8	15.9	8.7	8.9	11.4	10.2	12.7
	8	12.9	14.5	11.1	10.2	12.0	11.8	13.4
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Demand	1	12.7	18.4	5.2	12.0	9.4	8.4	9.8
	4	13.2	16.6	7.8	12.5	9.8	9.6	10.3
	8	13.8	15.5	10.3	13.0	10.9	11.9	11.1
	12	13.7	15.4	11.2	13.6	11.4	13.0	11.2

US Credit Shock and US GDP: Recent Crisis

2007-2009
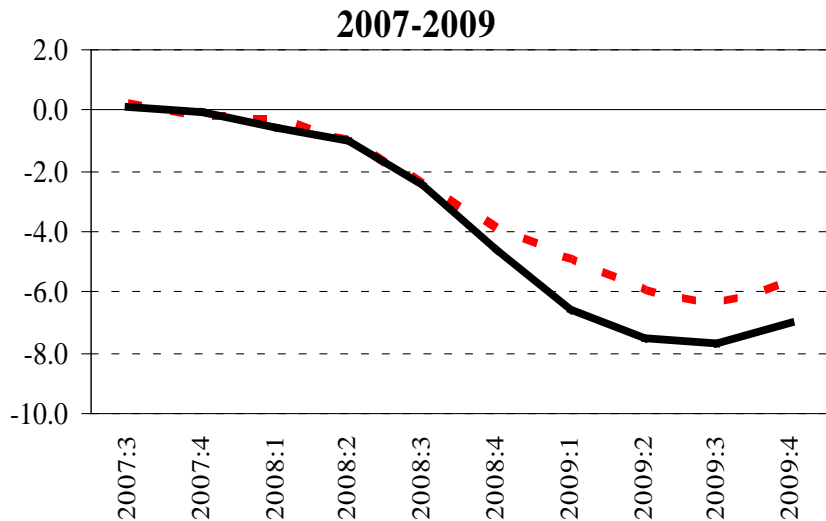
US Credit Shock and US GDP: Previous Episodes

Counterfactual — — — Actual
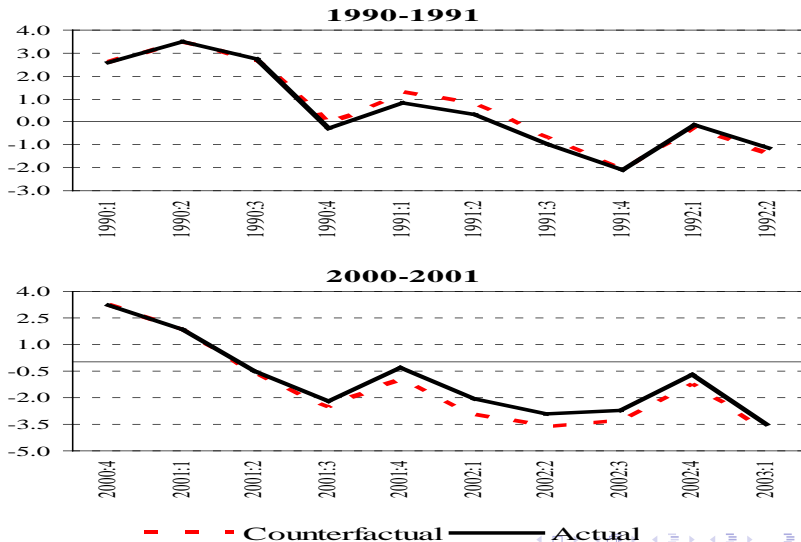
US Credit Shock and Global GDP

All Shocks and US GDP

2007-2009

1990-1991

2000-2001

■ Credit □ Productivity ⊞ Policy ▨ Demand
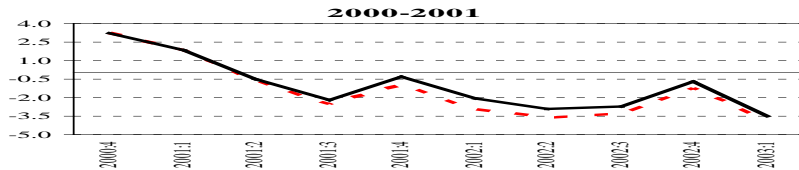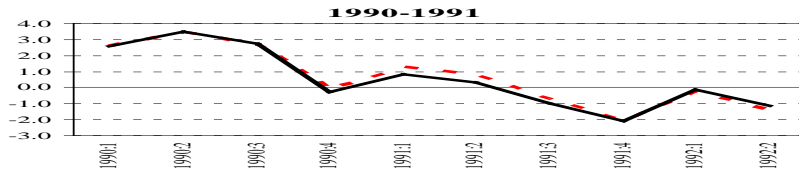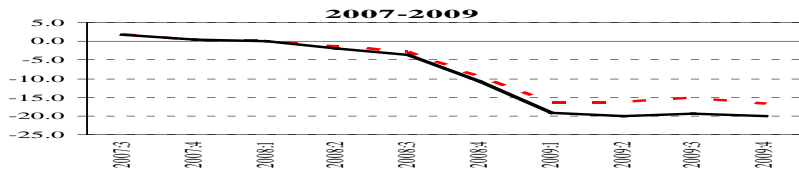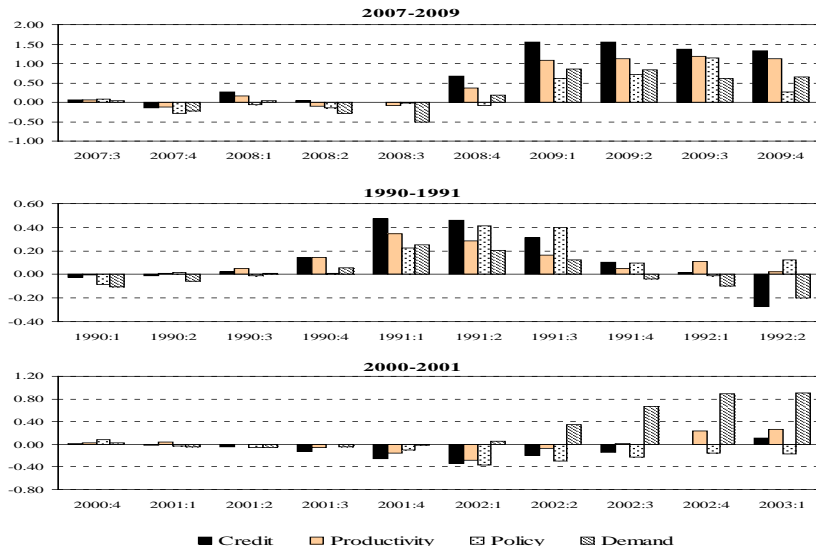
All Shocks and Global GDP
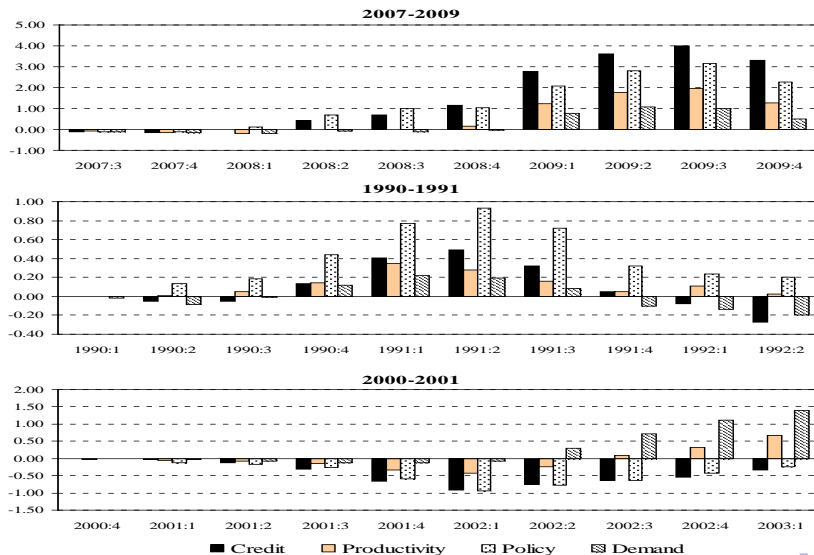
Conclusion

- This paper is the first to study credit shocks at a global level
- We find that global credit shocks:
  - Have a modest impact on GDP, but not other variables
  - On average they are about as important as other shocks
  - Were a prime driver of the crisis, accounting for 25 percent of the decline
  - Were not very relevant for the 1991 and 2001 recessions
- We find that US credit shocks:
  - Have a modest impact on Global GDP
  - Were a prime driver of the global recession of 2009
  - Were a prime driver of the US recession of 1991