Capital Flows, House Prices, and the Macroeconomy

Evidence from Advanced and Emerging Market Economies[1]

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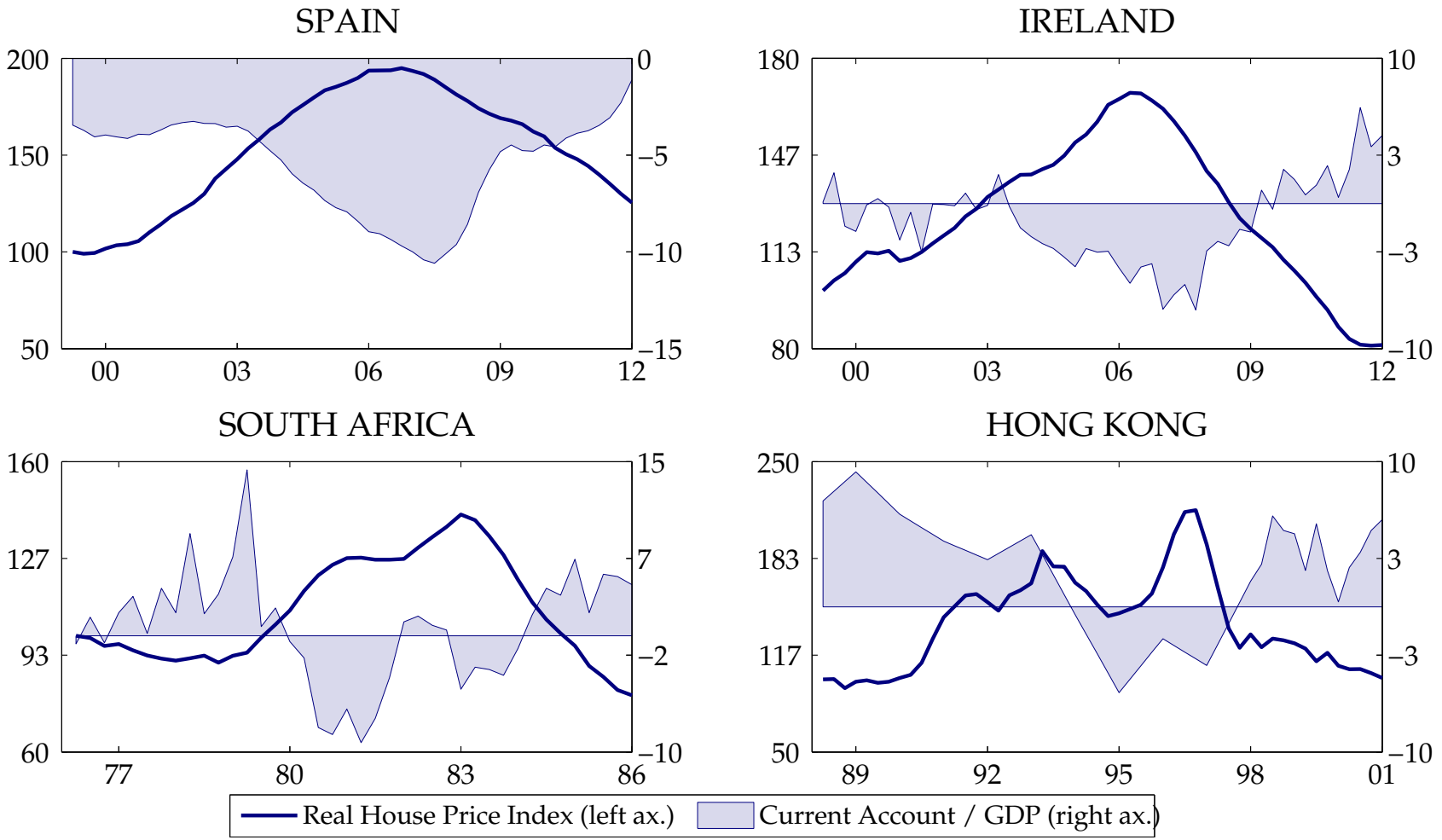
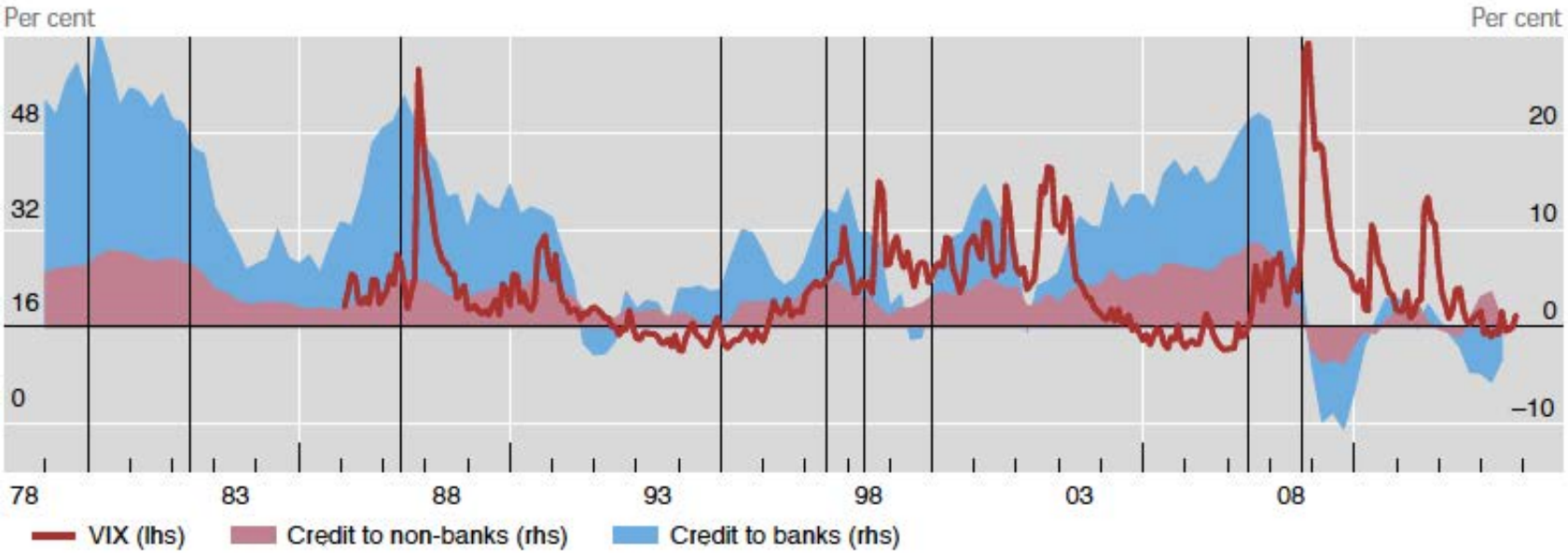
Housing quintessential non-tradable asset & non-tradable sector at the core of financial crises...



...capital abundant and highly mobile with limited investment opportunities

Year-on-year rate of growth in international claims[1] Graph I.1



The vertical lines indicate: 1979 second oil shock; 1982 Mexican default; 1987 stock market correction; 1994 Mexican peso devaluation; 1997 Asian financial crisis; 1998 Russian default and LTCM; 2000 Nasdaq peak; 2007 beginning of global financial crisis; 2008 collapse of Lehman Brothers.

[1] Includes all BIS reporting banks' cross-border credit and local credit in foreign currency.

Sources: Bloomberg; BIS locational banking statistics by residence.

Contribution

- New comprehensive, quarterly house price data set comprising 57 advanced and developing economies
- A new set of house price stylized facts
- Characteristics of house price booms
- Transmission of a "global liquidity shock"

Related Literature

- Global house price cycle
- House prices and global imbalances
- Global liquidity

Preview of the results

- Relative to AEs, house prices in EMEs are
  - Slower and more associated with fundametals, more volatile and less persistent
  - More associated with external variables
- Relative to AEs, house price booms in EMEs are
  - Larger, more closely associated with loose global liquidity conditions
- A global liquidity shock has
  - A stronger impact on consumption in EMEs
  - Qualitatively different impact on external variables

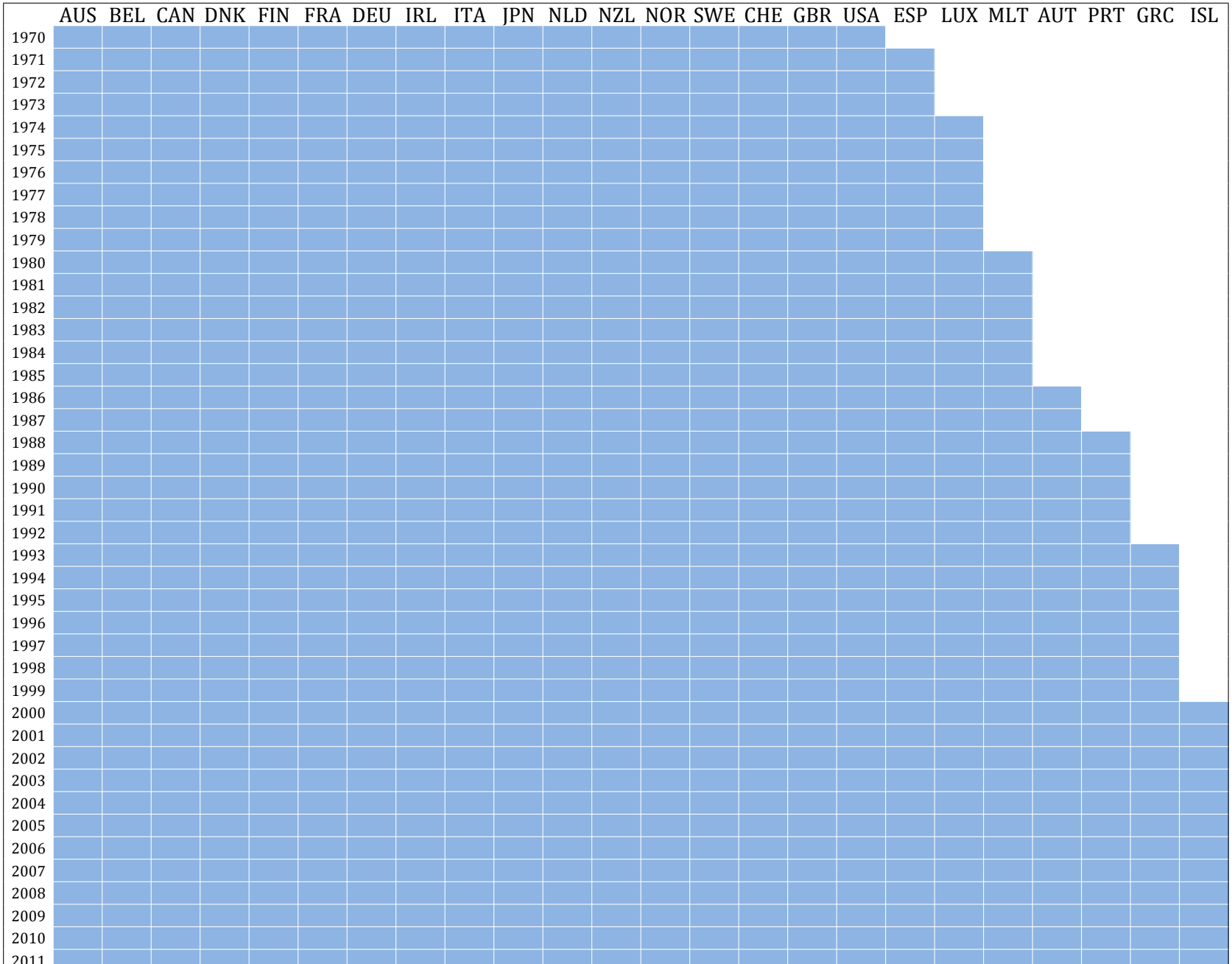
Outline

- House Price Data & Descriptive statistics
- Event Study
- Global Liquidity
- VAR Analysis
- Conclusion

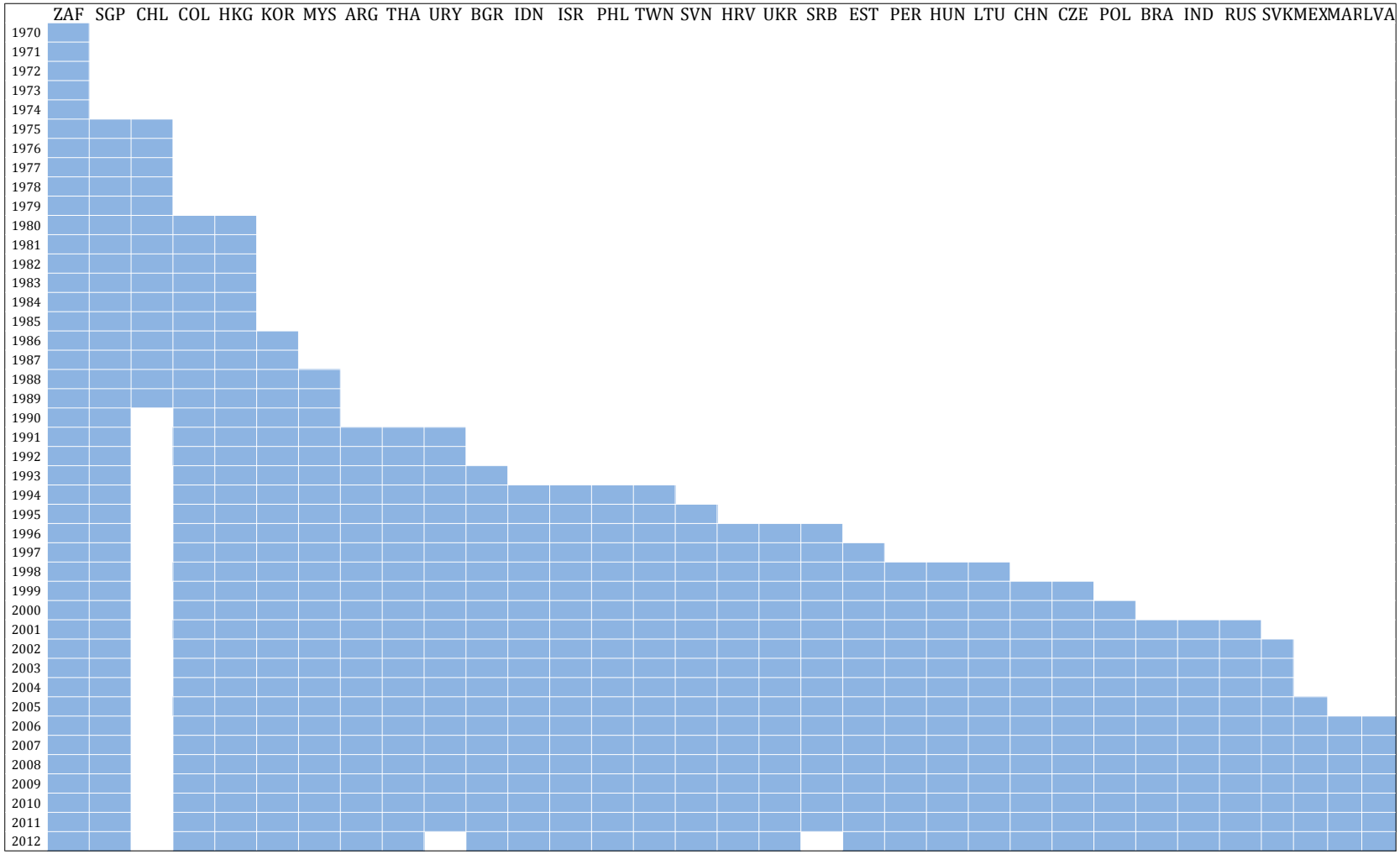
Data

- Unbalanced panel of 57 time series with varying coverage from 1970.I–2012.IV
- Source: OECD house price database, the BIS new property price data set, national central banks, national statistical offices, and academic publications on housing markets
- Value added relative to readily available datasets
  - Additional countries: Argentina, Brazil, Chile, Colombia, Croatia, India, Peru, Taiwan, Ukraine and Uruguay
  - Additional historical data: Austria, Czech Republic, Estonia, Hong Kong, Hungary, Indonesia, Malaysia, Philippines, Poland, Serbia, Singapore, Slovakia, Slovenia and Thailand.

Data Map: Advanced Economies



Data Map: Emerging Economies

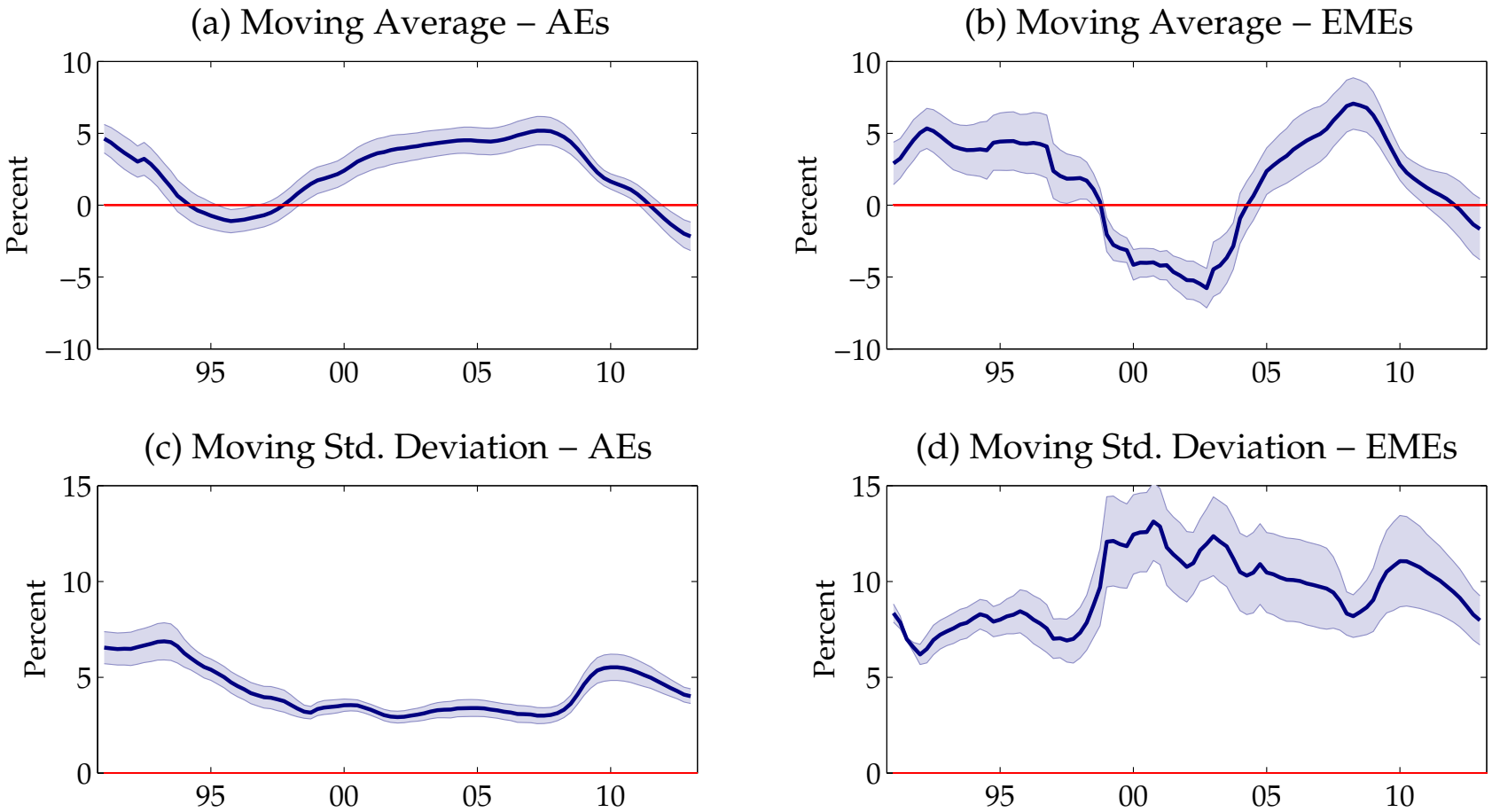


Real house price annual returns – Summary statistics

	Real House Price		*Real GDP*		*Real Consumption*	
Group	*AEs*	*EMEs*	*AEs*	*EMEs*	*AEs*	*EMEs*
Mean	2.0%	1.2%	2.2%	3.8%	2.3%	4.0%
Median	2.1%	1.5%	2.5%	5.0%	2.4%	4.7%
Max	18.3%	27.5%	7.0%	13.3%	7.5%	16.7%
Min	-12.5%	-34.5%	-5.8%	-13.3%	-3.9%	-16.4%
St. Dev.	6.4%	12.5%	2.3%	5.1%	2.2%	5.9%
Auto Corr.	0.92	0.86	0.83	0.87	0.81	0.79
Skew.	0.10	-0.44	-1.00	-1.12	-0.31	-0.67
Kurt.	3.20	4.34	4.91	6.15	3.88	6.12

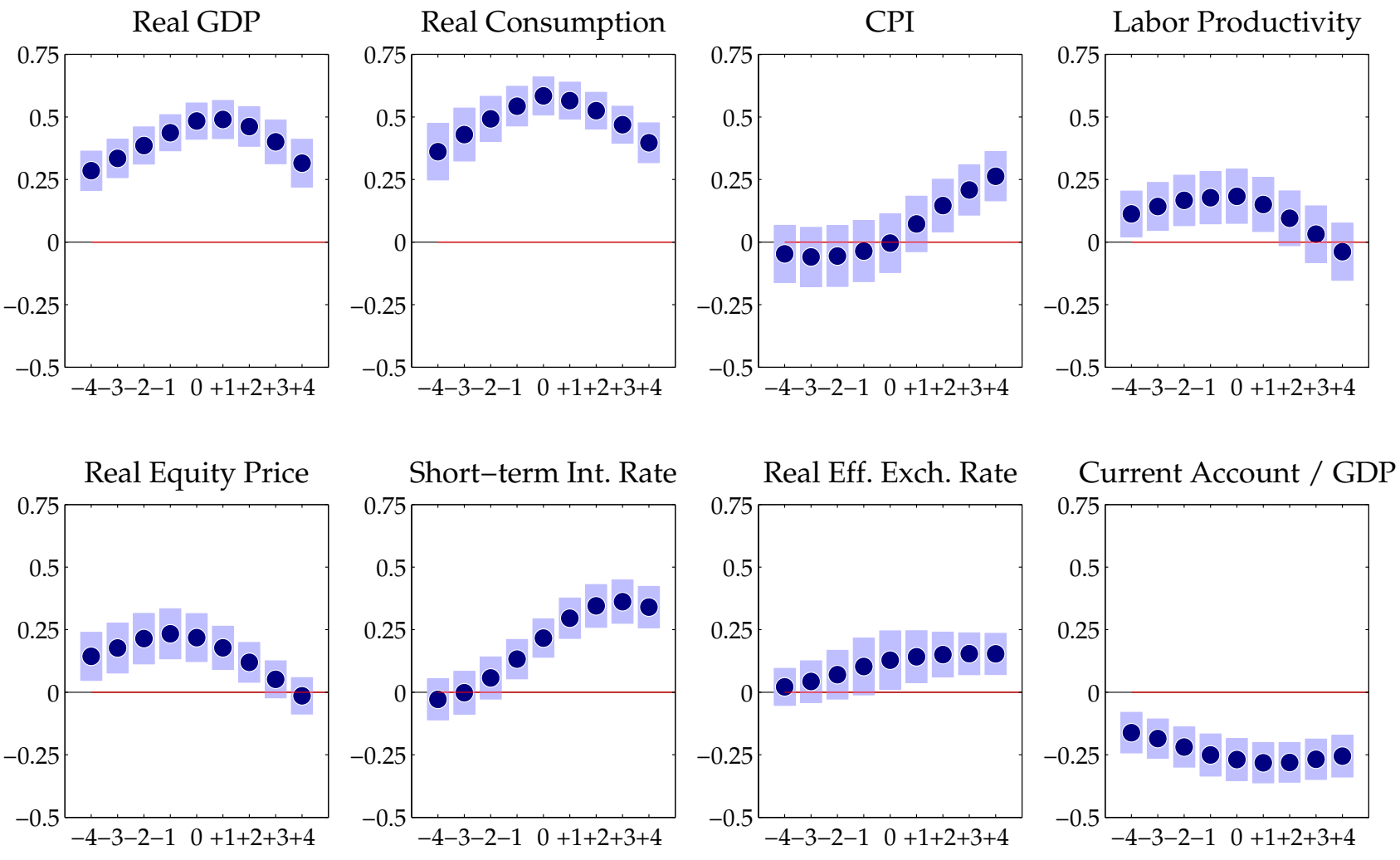
Note. The country-specific summary statistics are averaged across each group, namely advanced economies (AEs) and emerging economies (EMEs) and are computed across the common sample 1985.I–2012.IV.

Average and the standard deviation of real house price annual returns



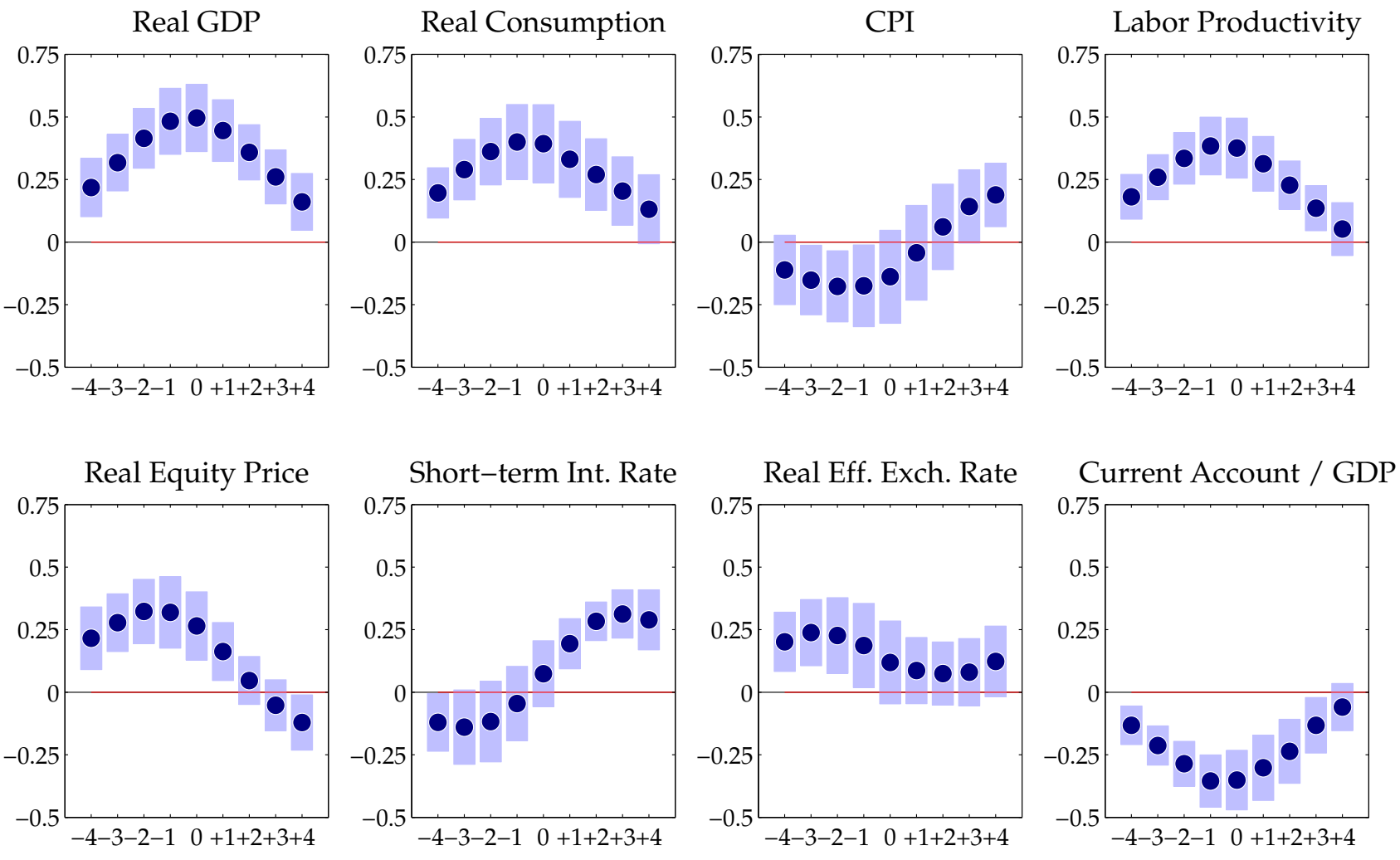
Cross-correlations of real house price annual returns (AEs)

(a) Advanced Economies



Cross-correlations of real house price annual returns (EMEs)

(b) Emerging Economies



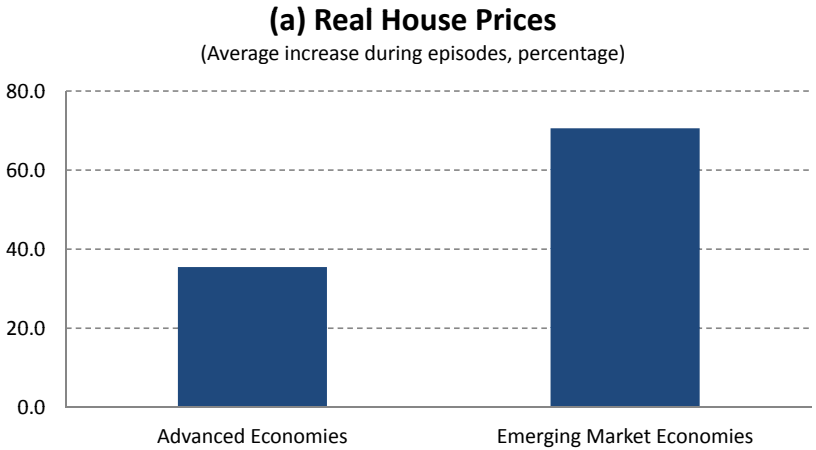
Event study

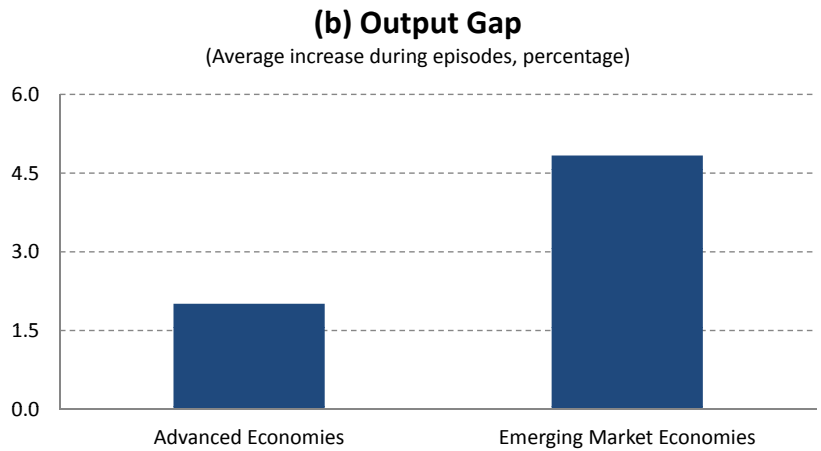
- We identify 66 real house prices booms (Bordo and Jeanne, 2002)

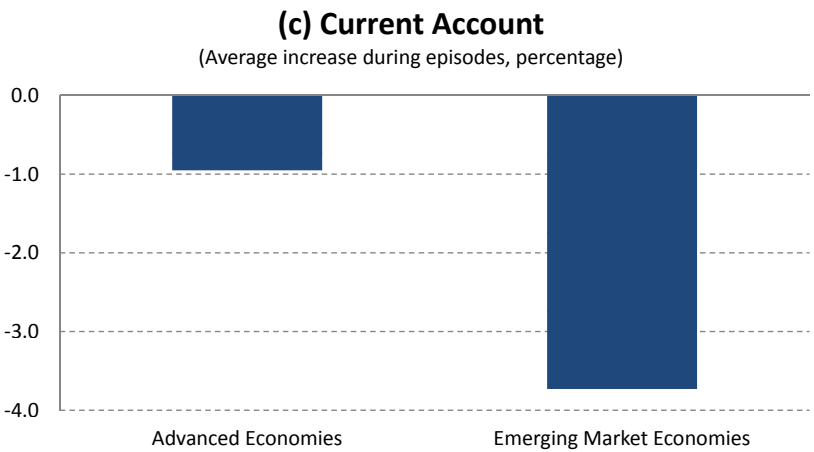
$$\frac{g_{i,t} + g_{i,t-1} + g_{i,t-2}}{3} \lessgtr g \pm x\sigma$$

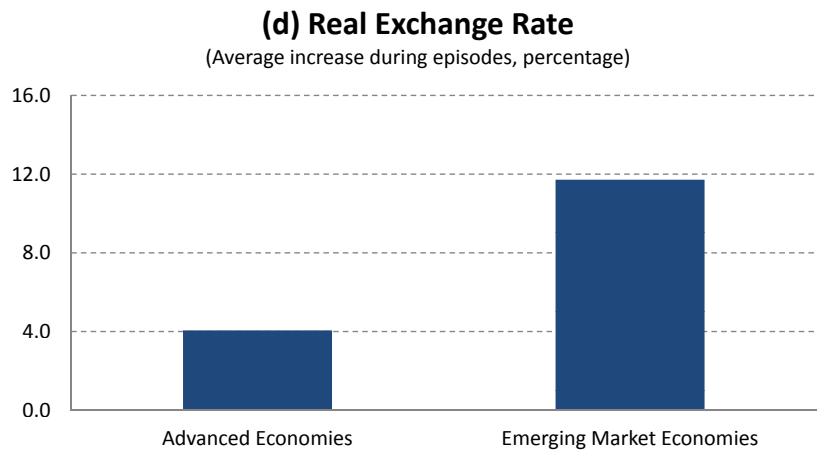
- During the identified boom episodes
  - Investigate the behavior of relevant macroeconomic variables (output gap, exch. rates, current acconut, capital inflows, VIX,...)
  - Investigate the role played by country characteristics (fin. market depth, exch. rate flexibility,...)

Event study – Results

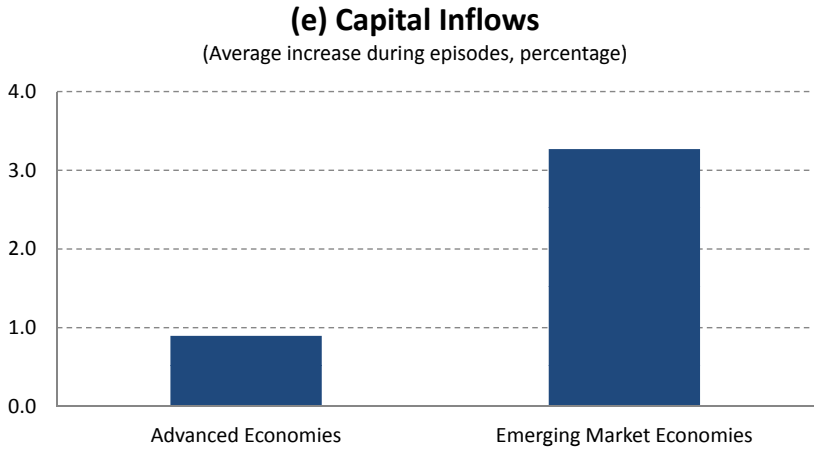


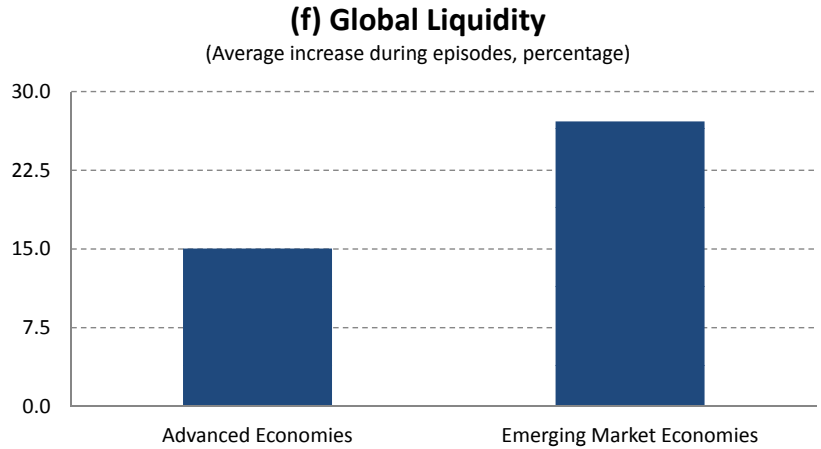


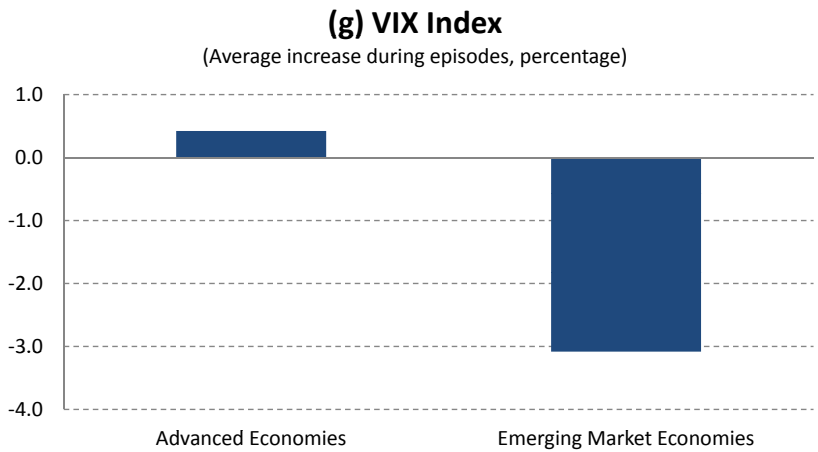


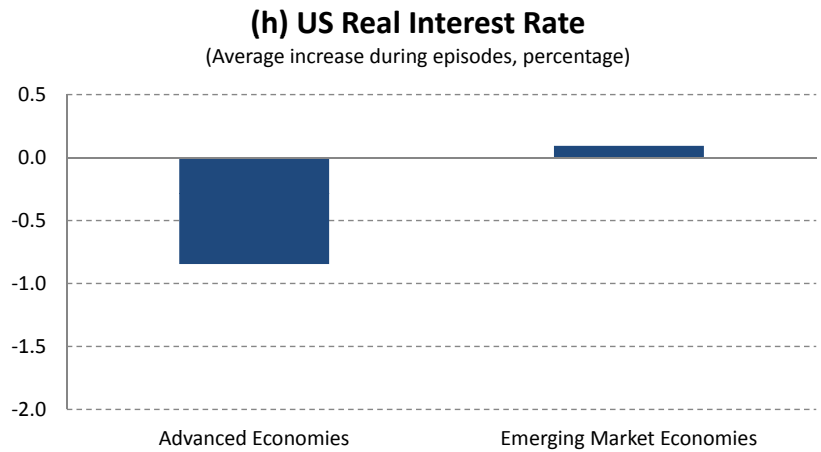


Event study – Results (cont'd)









Real house price determinants in boom episodes

	Dependent variable: change in real house price during boom							
Explanatory variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Capital inflows	2.26 (2.35)**	4.23 (2.47)**	4.05 (1.91)*	4.59 (2.53)**				
Global liquidity					0.58 (3.04)***	0.88 (2.87)***	1.21 (3.77)***	1.01 (2.13)**
Dummy AEs								
Financial market depth			-0.09 (-0.73)				0.02 -0.14	
Exchange rate flexibility				-0.55 (-0.51)				0.66 -0.44
Dummy AEs × Capital inflows		-5.27 (-2.73)***						
Financial market depth × Capital inflows			-0.05 (-1.73)*					
Exchange rate flexibility × Capital inflows				-0.38 (-1.90)*				
Dummy AEs × Global liquidity						-0.70 (-2.21)**		
Financial market depth × Global liquidity							-0.01 (-1.95)*	
Exchange rate flexibility × Global liquidity								-0.06 (-1.10)
R2	0.06	0.16	0.19	0.11	0.14	0.22	0.28	0.16
Number of observations	60.00	60.00	58.00	60.00	66.00	66.00	62.00	66.00
F test	5.51**	3.73**	1.66	2.30*	9.25***	4.17**	5.89***	3.11**

Note. All regressions are estimated using a constant, t-test in parenthesis. Significance levels at 1%, 5%, and 10% is denoted by ()***, ()**, ()*, respectively.

Global liquidity: a push factor for capital flows

- Empirical models of international capital flows typically include "push" (i.e., global) and "pull" (i.e., local) drivers

1. Growth differentials
2. Yield differentials
3. Competitiveness

Defining Global Liquidity

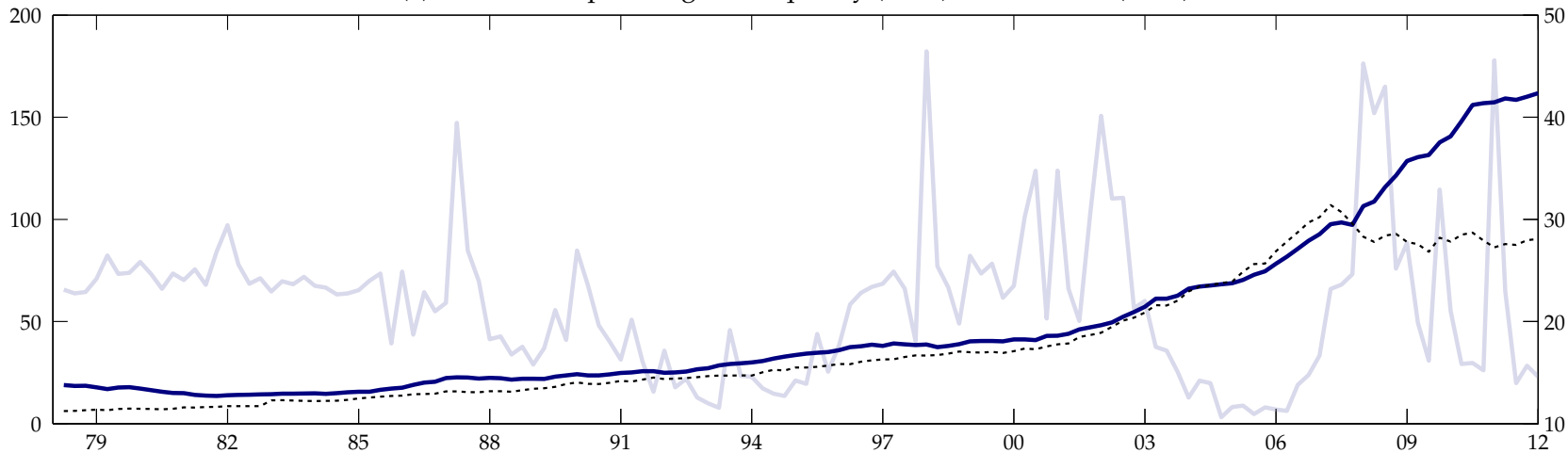
- Acknowledging that a precise definition is still missing, the BIS defines GL "as ease of financing"
- While "ease of financing" can be influenced by monetary policy, it also is affected by a range of other factors, such as banks' willingness to extend credit, macro-prudential measures, etc.

Measuring Global Liquidity

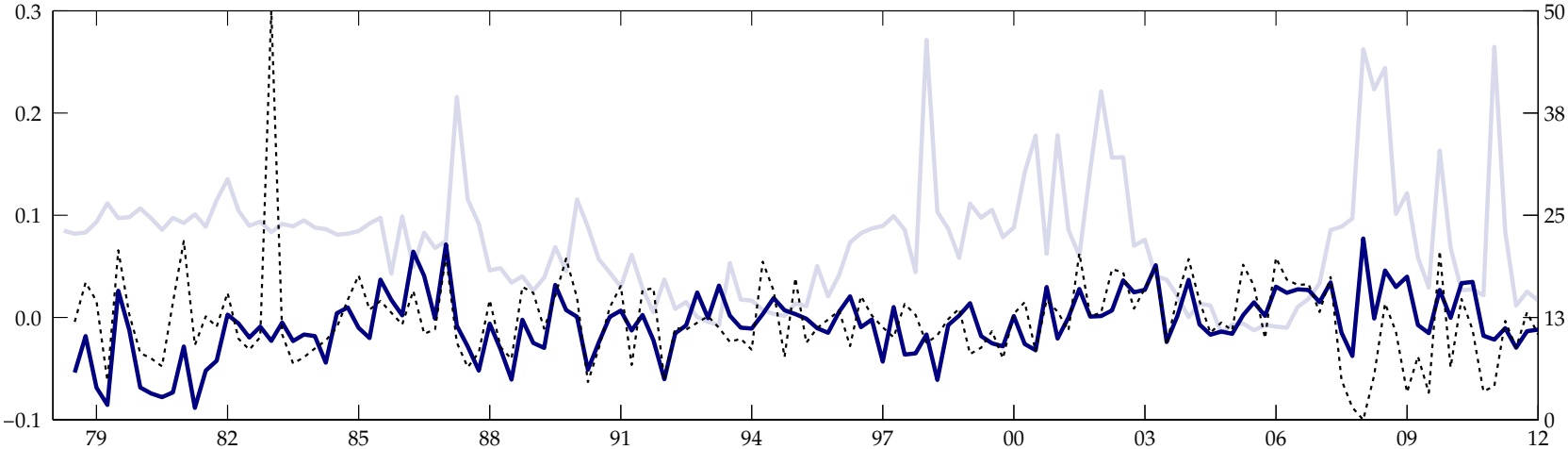
- We measure global liquidity in three different ways
  1. Official global liquidity: The funding that is unconditionally available to settle claims through monetary authorities
  2. Private global liquidity: Cross-border operations of banks and other financial institutions
  3. VIX Index: Investors' appetite for risk; willingness to lend, to extend credit, to take risk

Global liquidity measures & VIX index

(a) Official and private global liquidity (level) & VIX Index (level)



(b) Official and private global liquidity (log change) & VIX Index (level)



Off. liquidity (left ax.) Priv. liquidity (left ax.) VIX Index (right ax.)

Correlation between global liquidity measures

	Off. Liquidity (level) *Priv. Liquidity (level)*	*Priv. Liquidity (level)* *VIX index (level)*	*Off. Liquidity (level)* *VIX index (level)*
Full Sample	0.92	-0.05	0.01
Pre-Crisis	0.99	-0.30	-0.28
Post-Crisis	-0.12	0.00	-0.41
	Off. Liquidity (log diff.) *Priv. Liquidity (log diff.)*	*Priv. Liquidity (log diff.)* *VIX index (level)*	*Off. Liquidity (log diff.)* *VIX index (level)*
Full Sample	0.29	-0.18	-0.06
Pre-Crisis	0.38	-0.13	-0.23
Post-Crisis	0.43	0.12	0.32

Note. Note here.

A Framework

- Small, open New Keynesian economy
- Augmented with domestic housing sector

Link between Global liquidity and House Prices

- Global liquidity eases external financing
- Easier financing leads to more consumption of housing and non-housing
- Higher demand of housing leads to higher house prices
- Higher house prices leads to easier domestic financing ... and so and so forth

A panel VAR with "pull" and "push" factors

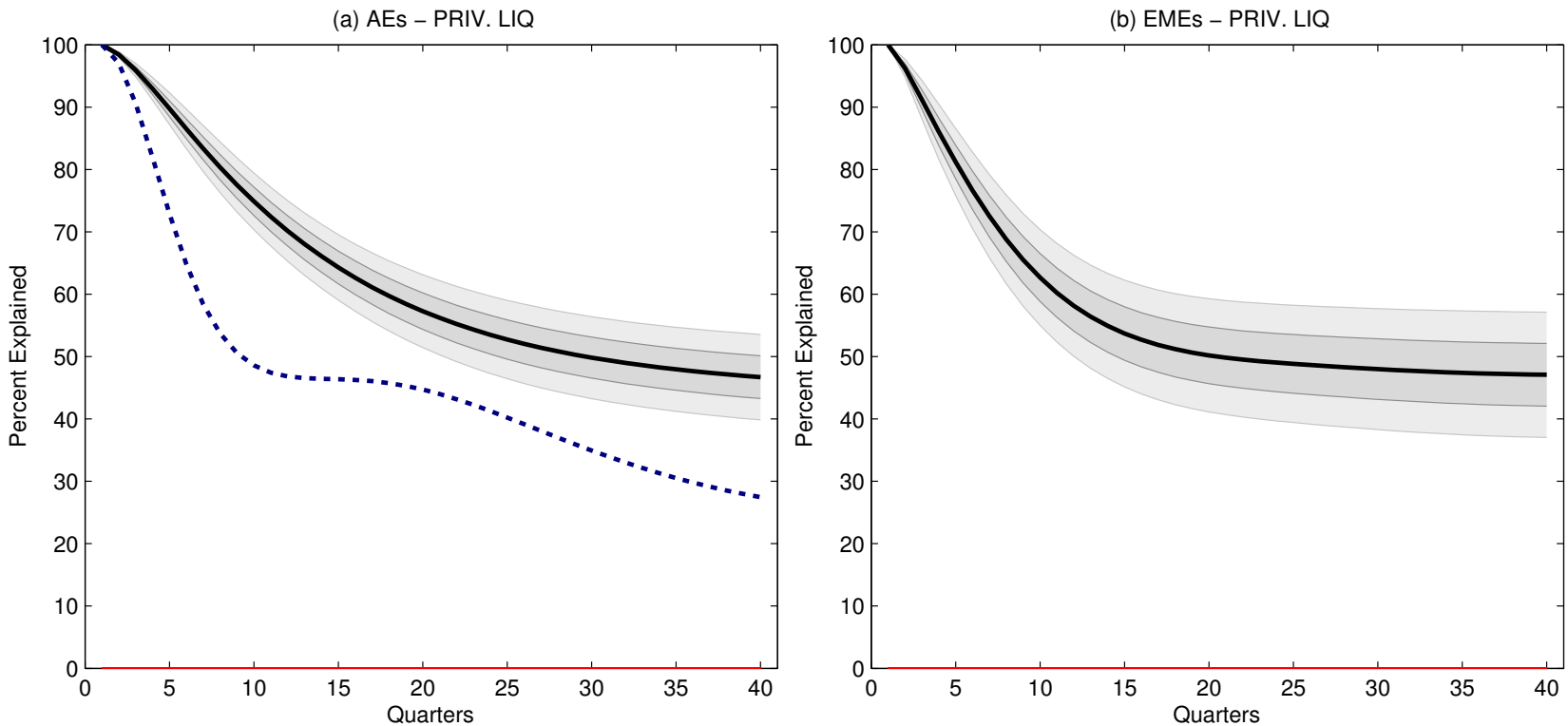
- Vector autoregression (VAR) model for country i includes

$$x = \begin{bmatrix} \text{GLOBAL LIQUIDITY} \\ \text{CONSUMPTION} \\ \text{REAL HOUSE PRICE} \\ \text{SHORT-TERM INT. RATE} \\ \text{REAL EFF. EXCH. RATE} \\ \text{CURRENT ACC. / GDP} \end{bmatrix}$$

- We identify only exogenous changes to one particular push factor: global liquidity
  - Identification assumption: no individual country is large enough to affect it significantly within a given quarter

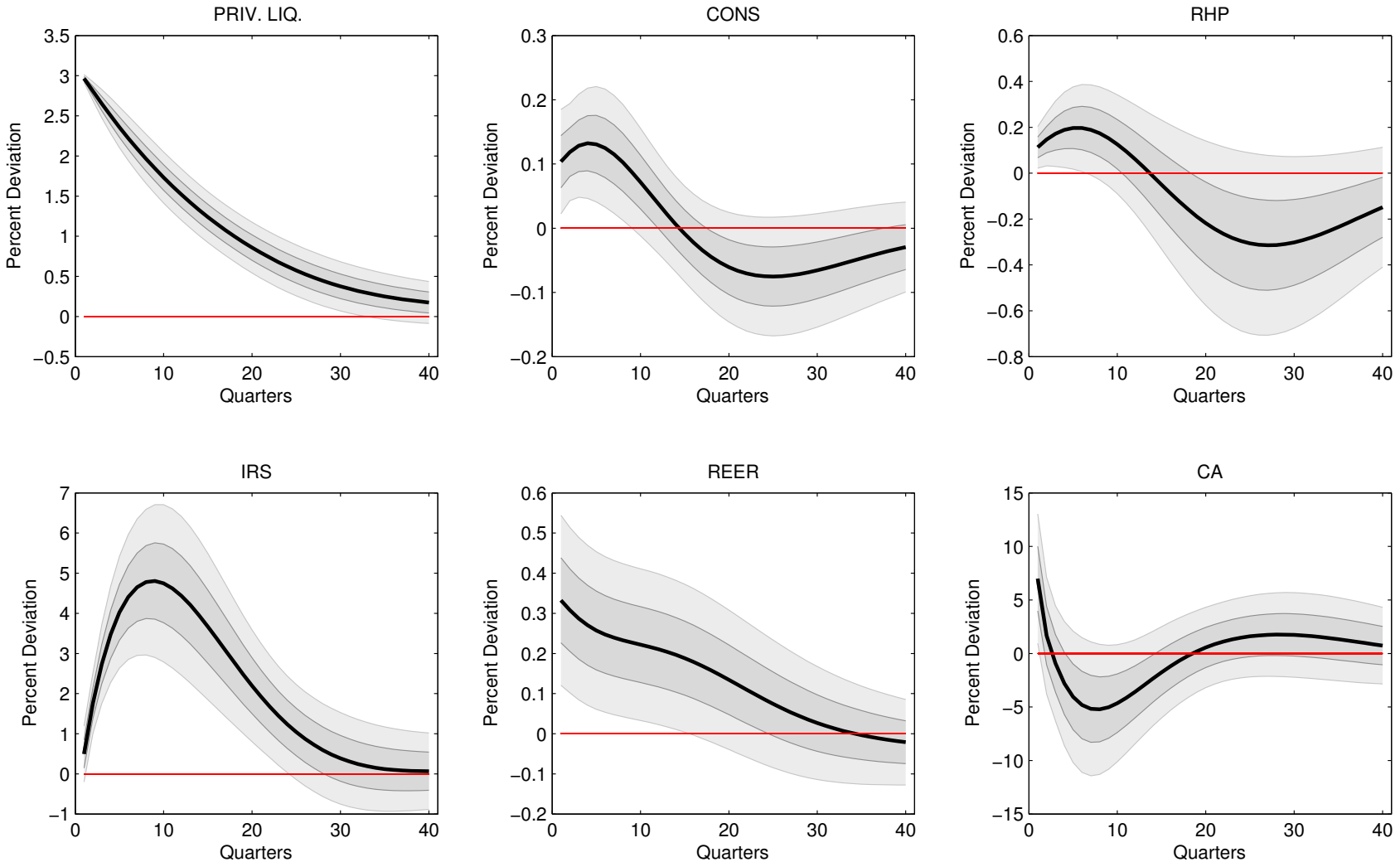
- Mean group estimator (dynamic panel data models with heterogenous slope coefficients)

Checking our identification assumption: FEVD to a global liquidity shock



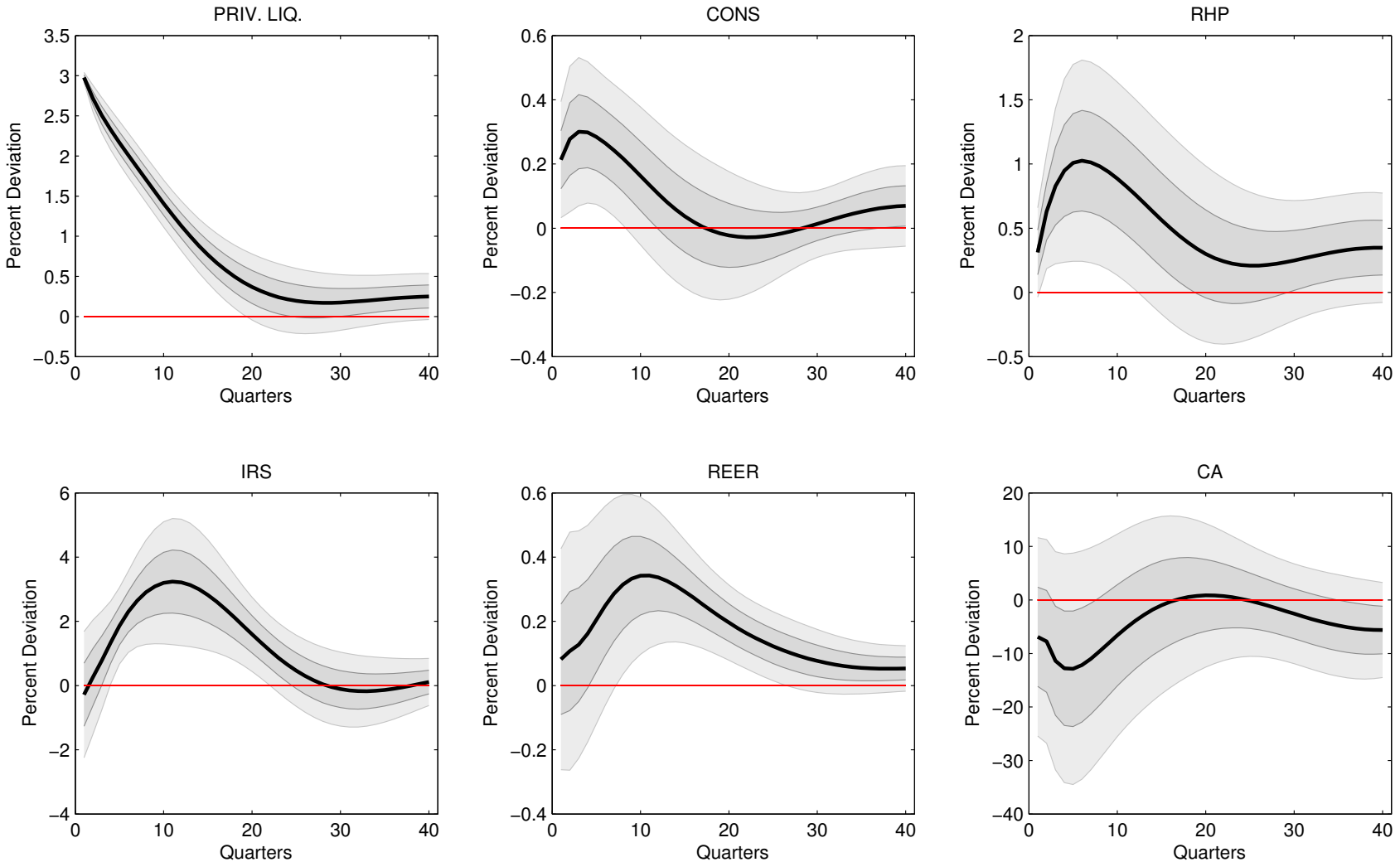
Impulse response function to a global liquidity shock (AEs)

(a) Advanced Economies



Impulse response function to a global liquidity shock (EMEs)

(b) Emerging Economies



Conclusions

- In this paper we explore empirically the relation among capital flows, house prices, and the broader macroeconomy

- We find that:
  - House prices in EMEs are slower, more associated with fundametals and external variables, more volatile and less persistent
  - House price booms in EMEs are larger, more closely associated with loose global liquidity conditions
  - A global liquidity shock has a stronger impact on consumption in EMEs with qualitatively different impact on external variables

Conclusions (cont'd)

- We interpret this evidence as suggesting that while global imbalances may have played a lesser role in the housing boom in AEs, the increase in global liquidity in response to it may be playing an important role for house price dynamics in EMEs

- Work to do
  - Better understanding of the mechanisms
  - Exploring the distribution around the means

THANK YOU