Financial Vulnerabilities, Macroeconomic Dynamics, and Monetary Policy

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Motivation

- The global financial crisis highlighted the importance of financial factors for the real economy
- Long tradition linking risk appetite to business fluctuations
  - —Keynes “animal spirits”, Minsky “financial instability hypothesis”, etc
  - —High credit and asset valuations predict subpar economic performance, financial crises and weaker recoveries (Borio and Lowe, 2002; Schularick and Taylor, 2012; Jorda, et al 2013; Drehmann and Juselius, 2015)
  - —How do risk appetite, credit and monetary policy interact?

➢ Implications for policy: Use monetary policy to “lean”? Macropru?

Our paper

- We characterize the time series of the credit-to-GDP gap and "risk appetite," 1975 to 2014
- We estimate VAR models of the macroeconomy and monetary policy
  - —Augmented with our risk appetite measure and the credit-to-GDP gap
  - —Threshold VAR allows for nonlinear dynamics
- We characterize the response to
  - —Risk appetite shock
  - —Monetary policy shock
- We split the sample into periods when the credit-to-GDP gap is high or low to test for nonlinearities

Key empirical results

- Our **risk appetite** measure
  - —Is an indicator of financial conditions and is expansionary
  - —But can lead to a higher credit-to-GDP gap and recession
- Dynamics are nonlinear depending on **credit-to-GDP gap**. When gap is high:
  - —ALLM shocks lead to recessions
  - —Monetary policy is ineffective
- **Monetary policy**
  - —Is not effective and does not cool risk appetite when the credit gap is high
  - —Using Hanson-Stein (2015) framework, less transmission to far future yields when the credit gap is high

VAR specification

- U.S. macro data 1975:Q1 to 2014:Q4
- Log real GDP, GDP deflator, unemployment rate, Federal Funds rate
- Risk appetite variable ("ALLM") – asset valuations and lending standards in 4 sectors (HH, business credit, CRE, and equity market)
- Candidate vulnerability measures
  - Credit-to-GDP gap (focus here today)
  - Household vs. business credit; bank vs. nonbank
  - ALLM
- We define a measure to be a vulnerability if an impulse to the measure leads to an economic contraction

VAR dynamics

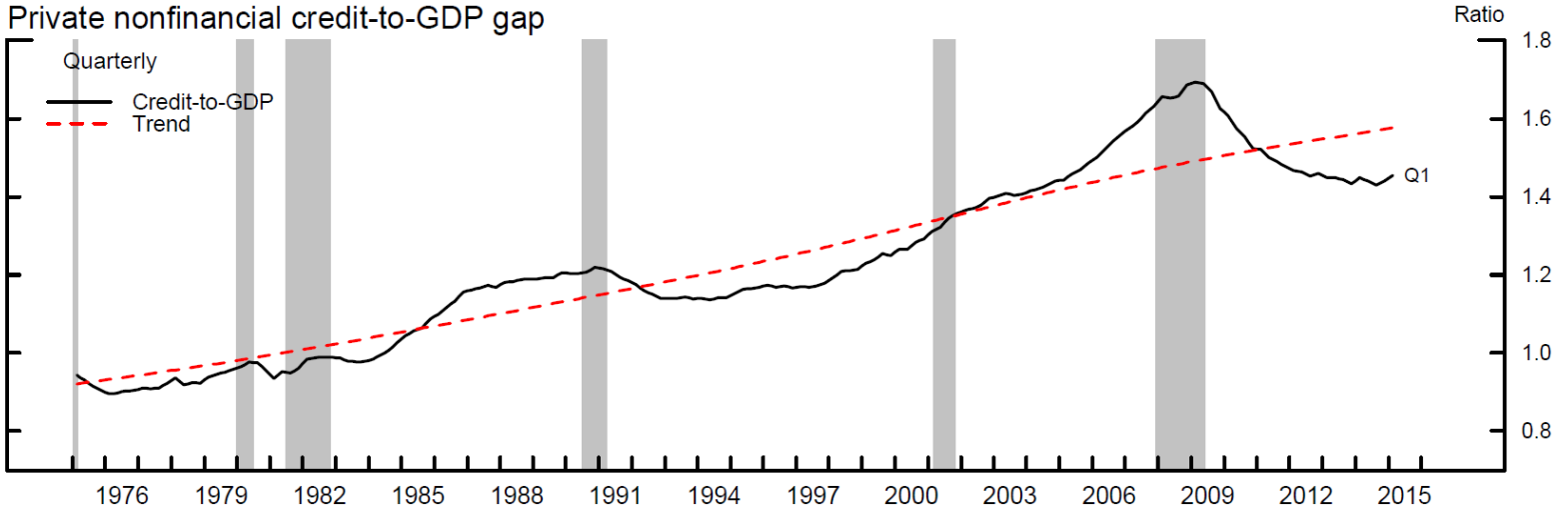
- Shocks are identified using the Cholesky decomposition with shocks ordered as in the monetary policy literature
  - Monetary policy reacts to all shocks in a period
  - The vulnerability measure reacts to all shocks within a quarter save monetary policy
  - The unemployment rate, the GDP deflator, and real GDP react to shocks to the vulnerability measure and monetary policy with a one-quarter lag
- Estimate the VAR following Giannone, Lenza, and Primiceri (2015)
  - Bayesian technique specifies a prior that each variable follows a random walk, possibly with a drift; this reduces estimation uncertainty and leads to more stable inference.

Threshold VAR

- Nonlinear estimations – high vulnerability qualitatively different because the system might be susceptible to self-fulfilling negative dynamics
- Effectively estimate system on disjoint sets depending on whether the candidate vulnerability is above/below its mean
- We don't model transitions from one state to another

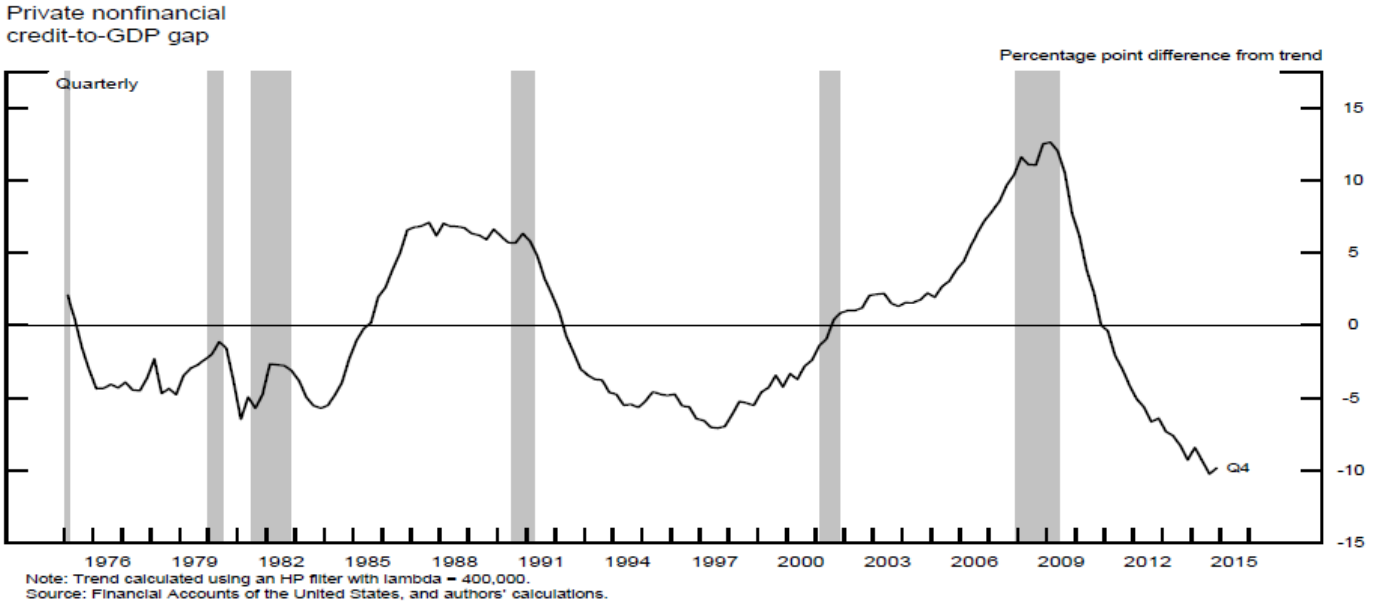
$$y_t = c^j + A(L)^j y_{t-1} + u_t^j \begin{cases} j = \text{high,if } \widehat{CY}_t > 0. \\ j = \text{low, if } \widehat{CY}_t \leq 0. \end{cases}$$

Credit-to-GDP and trend

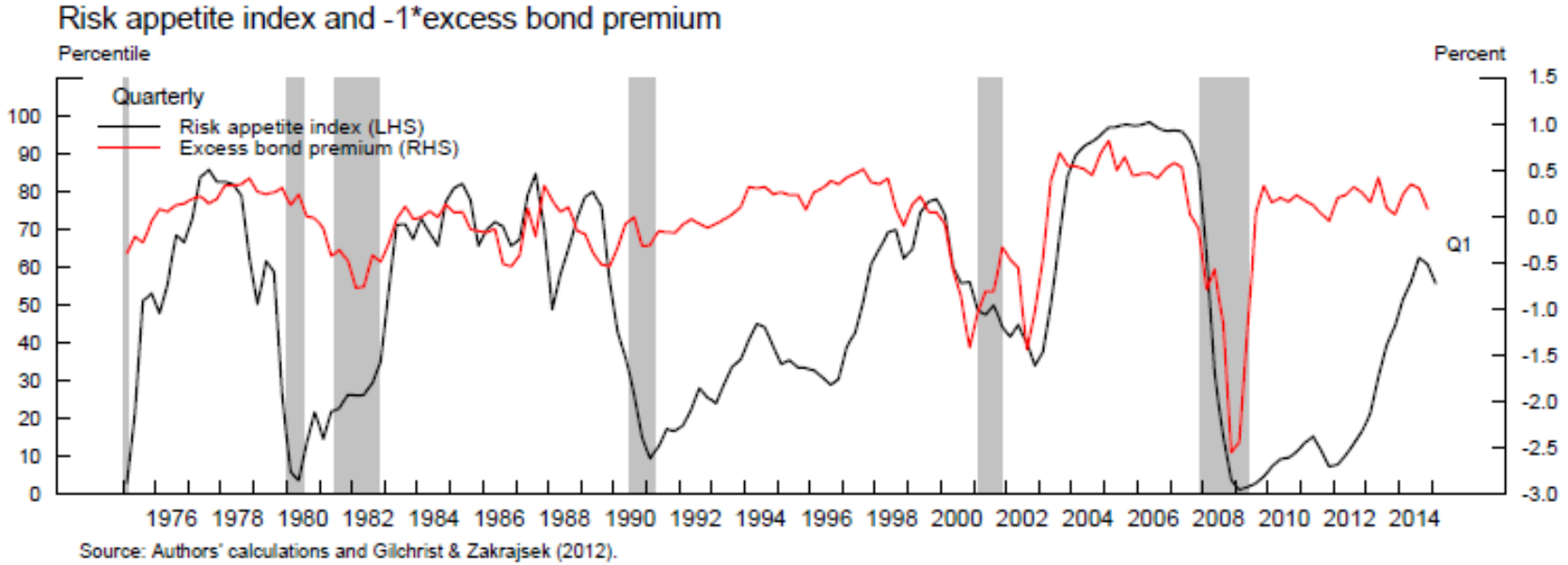


Note: Trend calculated using an HP filter with lambda = 400,000.
Source: Financial Accounts of the United States, and staff calculations

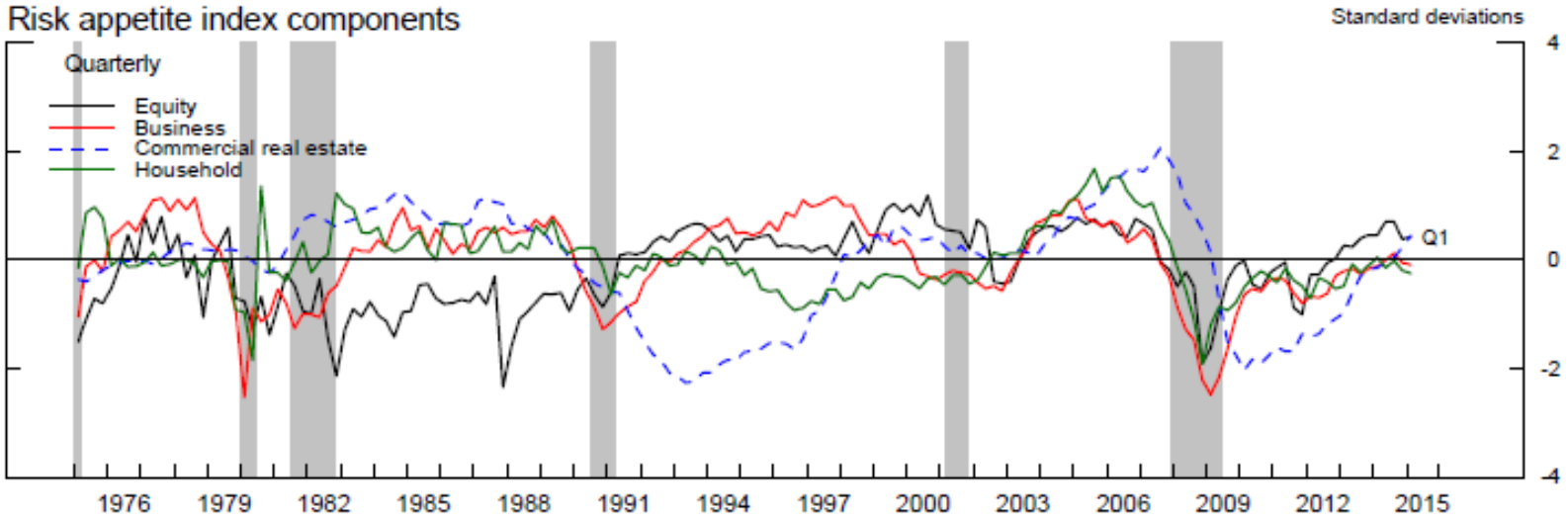
Credit-to-GDP gap (CY)



Risk appetite



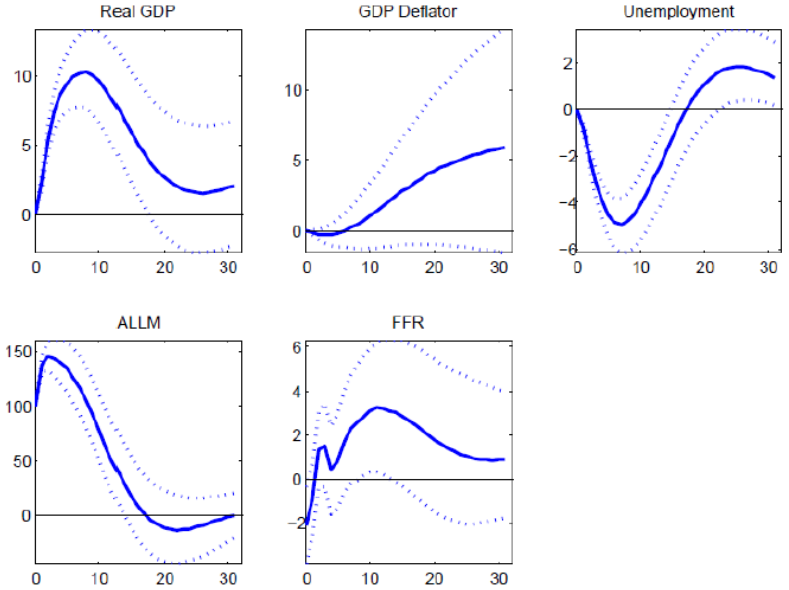
Components of risk appetite



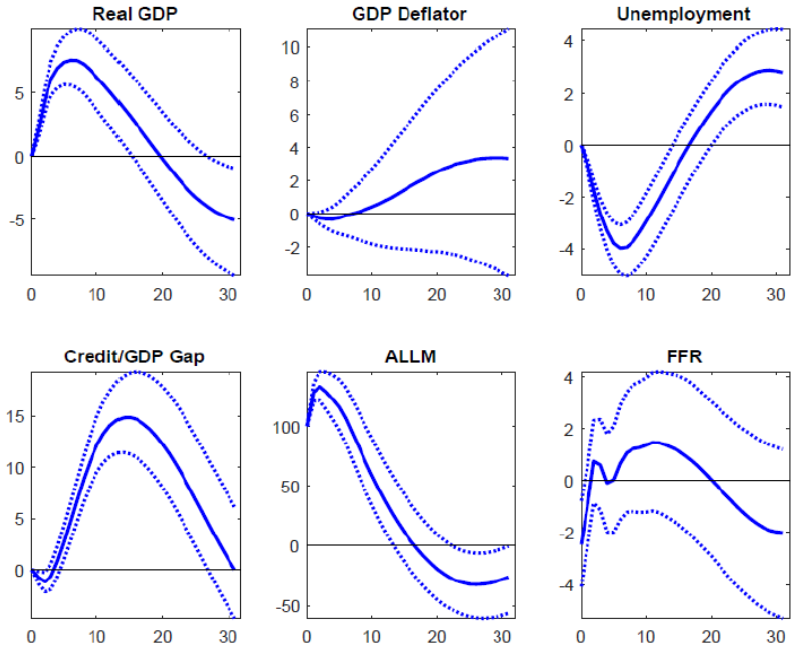
Note: The figure presents the component series of the risk appetite index. In computation of the index, these four components are respectively weighted by 2/10, 3/10, 2/10, and 3/10.

Source: Authors' calculations.

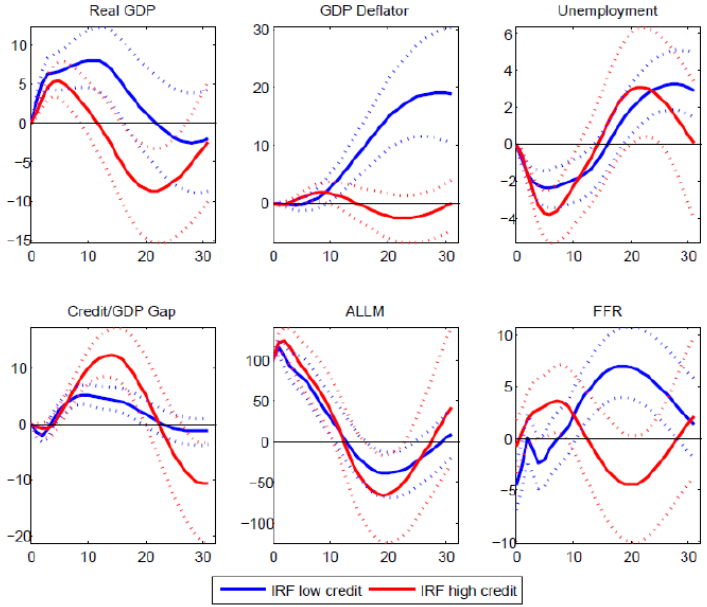
Shock to risk appetite is expansionary…



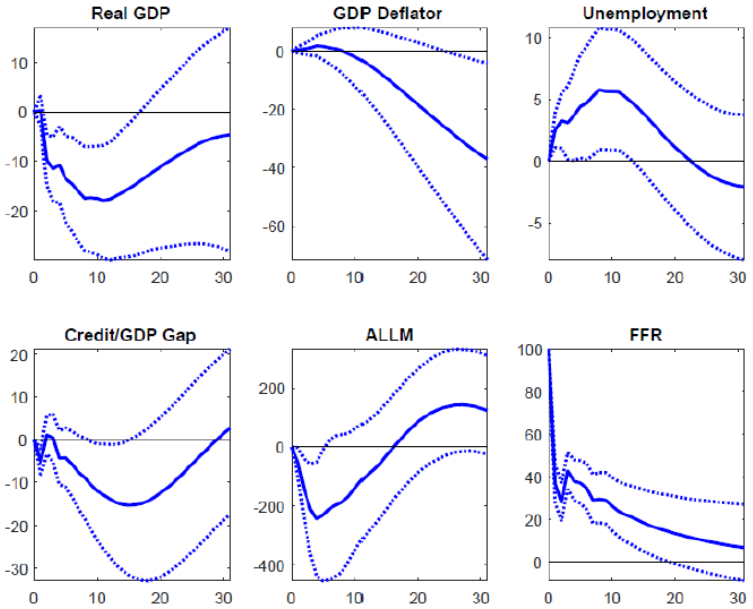
…even with the credit/GDP gap…



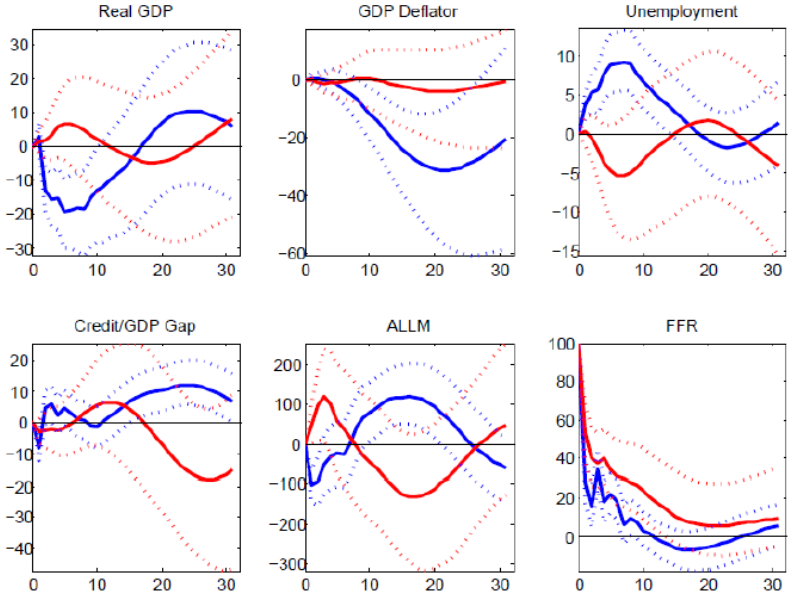
…but nonlinear effects: when CY is high, leads to a recession



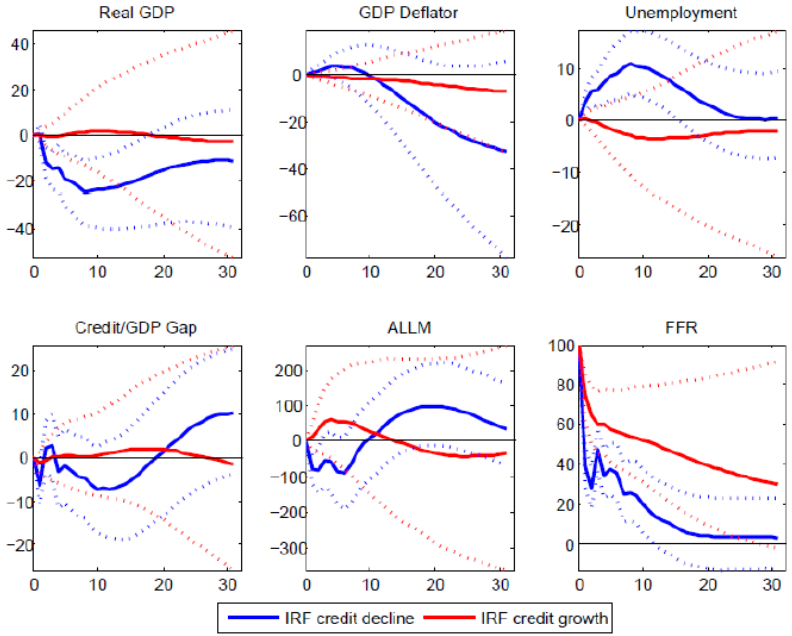
Monetary policy shock works as expected in a linear system…



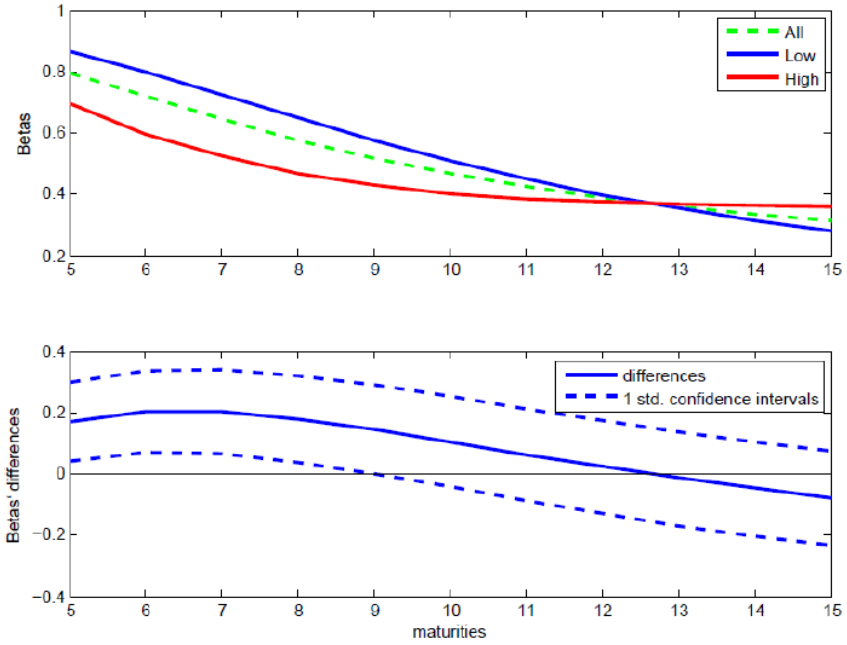
…but is ineffective when CY is high…



…and when CY is growing



Attenuation by horizon (Hanson-Stein, 1975-2014)



Conclusions

- Key findings:
  - —Credit-to-GDP gap matters for economic dynamics
  - —When credit gap is low, increases in risk appetite lead to sustained increases in output; but when it is high, such increases lead (with a lag) to contractions
  - —Monetary policy transmission is blunted when the credit gap is high, consistent with evidence of less transmission to distant forward rates
- Implications:
  - —Policymakers have an added incentive to prevent the credit gap becoming excessive; relative merits of using macropru vs monetary policy?
  - —What leads to high credit-gap states; role of demand or supply? Do it matter for the vulnerabilities we document?