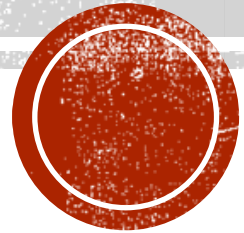
MONETARY POLICY WHEN THE CENTRAL BANK SHAPES FINANCIAL MARKET SENTIMENT

(BASED ON JOINT WORK WITH ANIL KASHYAP)



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HOW DOES MONETARY POLICY WORK?

- Conventional view: central bank controls short-term policy rate. If changes to short rate are persistent, this in turn affects longer-term *safe* rates of interest, e.g., the rate on 5 and 10-year government bonds.

- Changes in longer-term interest rates influence a variety of economic decisions.
  - Home purchases and homebuilding.
  - Autos and other durable goods.
  - Capital expenditures by firms.

- Conventional view is largely silent on investors' attitudes towards risk and financial-market risk-taking.

AN EMERGING "RISK-TAKING" VIEW

- Monetary-policy-related cuts in interest rates create a variety of incentives for increased risk-taking by investors: "reaching for yield".
- Think of a university endowment having a target of 5% real return so it can support the university's (relatively inflexible) budget.
- Or a pension fund that has long-term fixed obligations to its pensioners.
- Or a bank (Silicon Valley Bank?) that needs to earn an interest margin large enough to cover costs of its bricks and mortar.

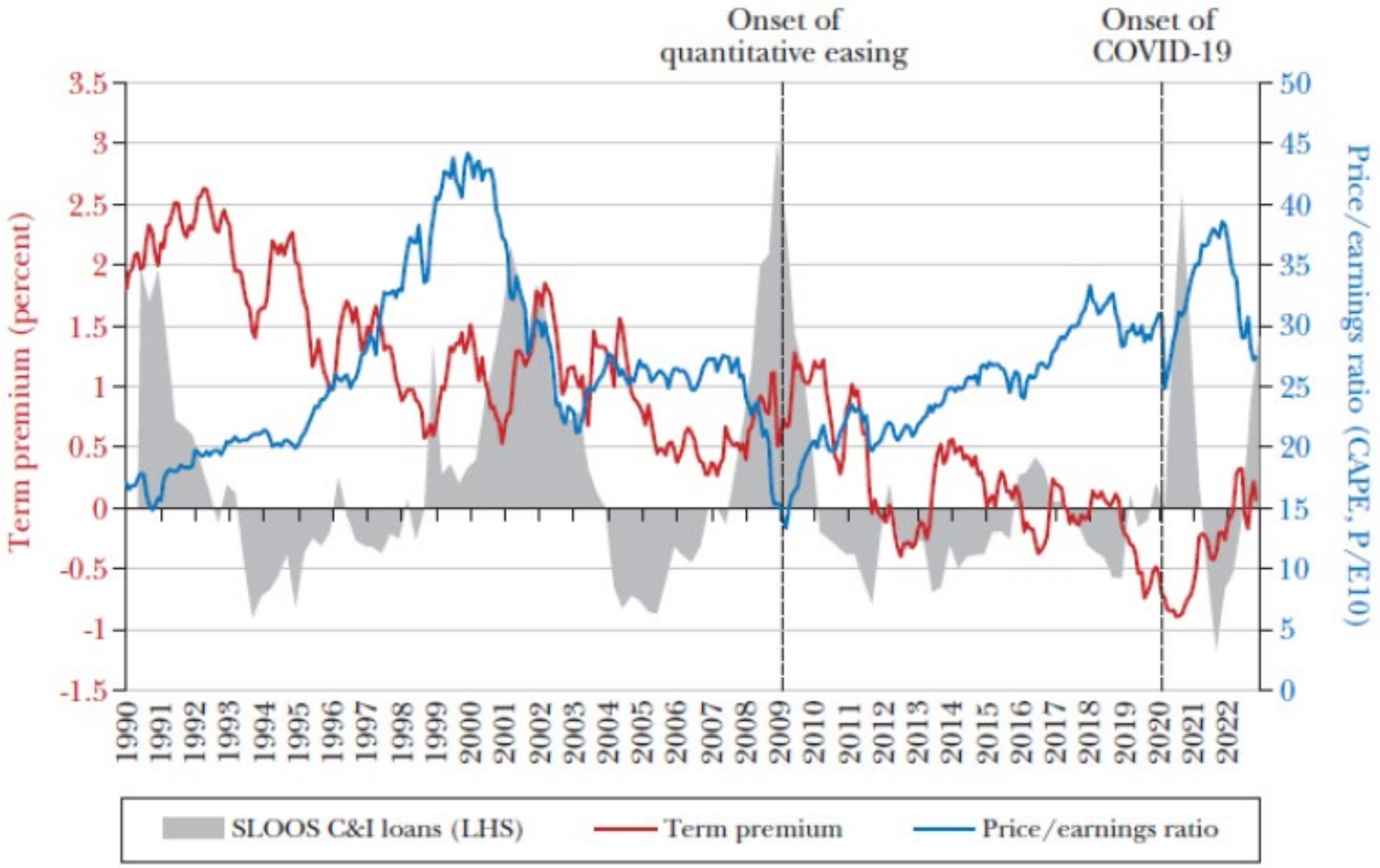
IMPLICATIONS FOR RISK PREMIUMS

- A large body of evidence finds that monetary policy influences risk premiums on a wide range of securities as well as on bank loans.
  - Stock market (Bernanke-Kuttner 2005).
  - Treasury term premiums (Hanson-Stein 2015; Hanson-Lucca-Wright 2021).
  - Credit spreads (Gertler-Karadi 2015).
  - Bank lending terms (Paligorova-Santos 2017; Dell'Ariccia-Laeven-Suarez 2017).

- Mechanism: as more investors reach for yield and hence display more tolerance for risk, equilibrium compensation for risk goes down.

Figure 1

Evolution of Stock Prices, Treasury Term Premiums, and Bank Lending Standards During the Quantitative Easing Era



AN INTERTEMPORAL TRADEOFF FOR MONETARY POLICY?

- Ability to influence risk-taking and risk premiums means accommodative policy has more kick than it otherwise would, which is especially helpful when rates are close to the zero lower bound.

- But downside is that increased risk-taking, elevated leverage and financial overheating can lead to reversals and increase odds of recession in the future.

- "Credit bites back": following periods of rapid credit growth and compressed risk premiums, there is elevated risk of recession or financial crisis.

- More of a concern when financial regulation is less effective.

ROADMAP

- What have we learned about credit booms and busts? Some evidence on credit-bites-back effects.
- The role of macroprudential regulation
- The role of monetary policy: a simple model

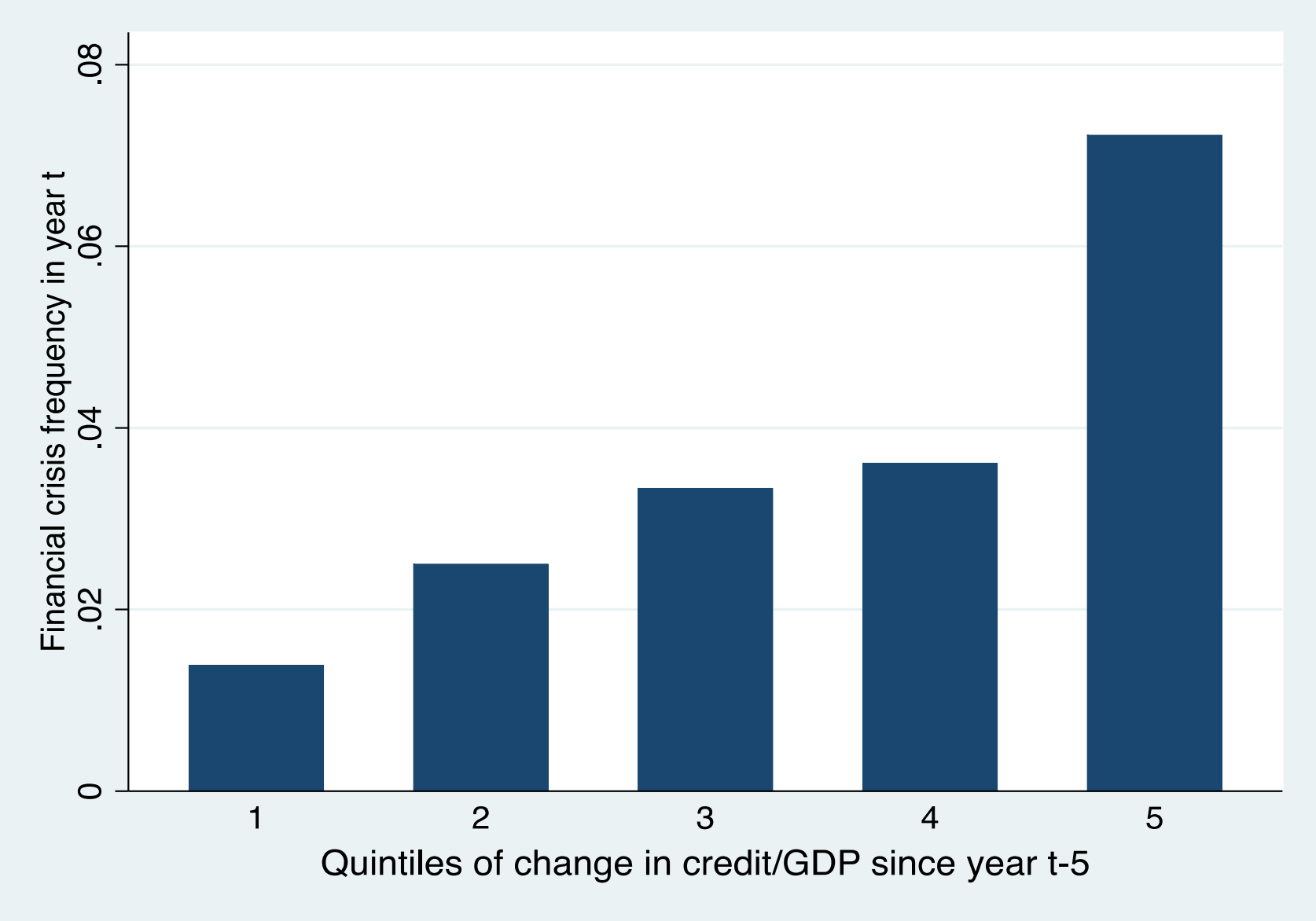
WHAT HAVE WE LEARNED? NEW EVIDENCE ON THE CREDIT CYCLE

- In long cross-country panels, rapid growth in quantity measures of credit tend to forecast recessions and financial crises.

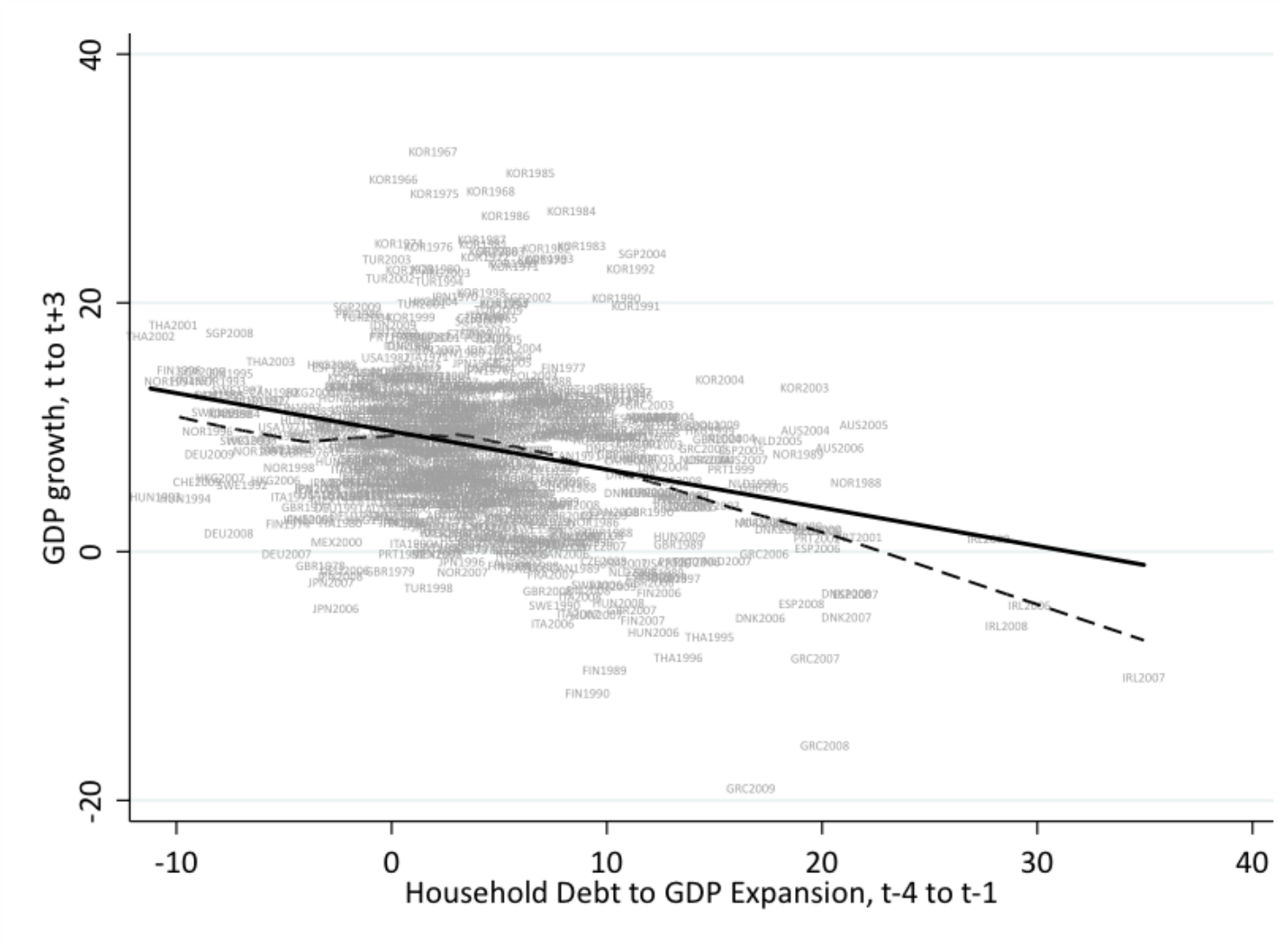
- There is important independent information in measures of sentiment that incorporate proxies for credit pricing and quality.
  - Narrow credit spreads and large fraction of high-yield issuance forecast low returns to credit investors going forward: as if markets are overly exuberant.
  - These credit-sentiment variables also forecast reduced economic growth at a 2-3 year horizon.

- Overall: credit booms—especially those associated with exuberant sentiment, aggressive pricing and lower-quality issuance—tend to end badly, both for lenders and the real economy.

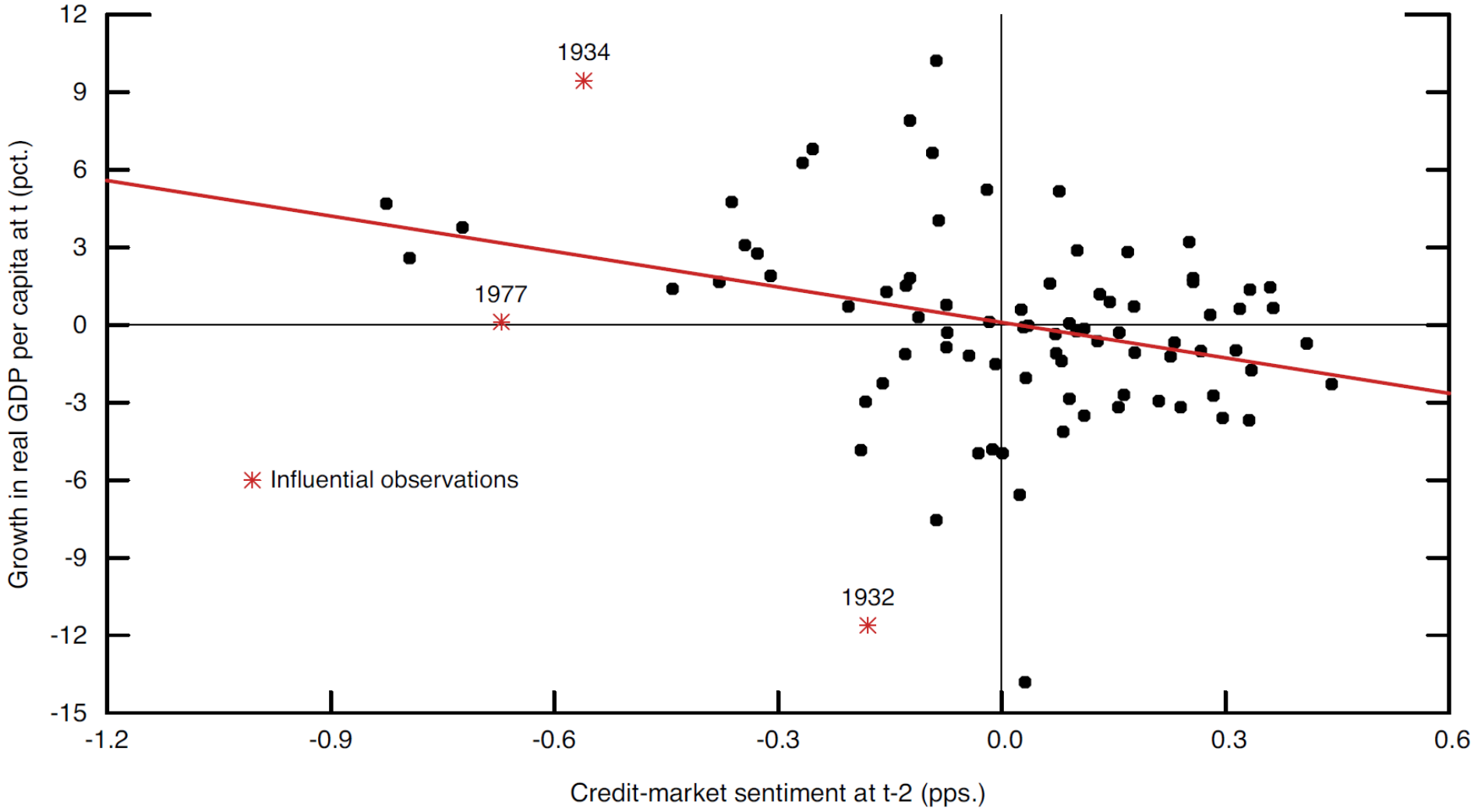
SCHULARICK-TAYLOR (2012): RAPID CREDIT GROWTH FOLLOWED BY CRISES



MIAN-SUFI-VERNER (2017): RAPID HOUSEHOLD CREDIT GROWTH FOLLOWED BY SLOWER ECONOMIC GROWTH



LÓPEZ-SALIDO, STEIN, AND ZAKRAJŠEK (2017): EXUBERANT CREDIT-MARKET SENTIMENT FOLLOWED BY SLOWER GROWTH



GREENWOOD ET AL (2021): PREDICTABLE FINANCIAL CRISES

- *Business Debt and Equity Prices*

	Crisis Frequency Debt Quintile					*Diff. from Median* Debt Quintile				
Price Tercile	1	2	3	4	5	1	2	3	4	5
1	4.2	4.9	4.1	7.1	19.3	-3.7	-3.1	-3.8	-0.9	11.3
2	3.5	5.3	8.0	9.5	19.4	-4.4	-2.7	0.0	1.6	11.4*
3	11.5	9.3	11.1	19.3	**45.3**	3.5	1.4	3.2	11.3	**37.4*****

- *Household Debt and House Prices*

	Crisis Frequency Debt Quintile					*Diff. from Median* Debt Quintile				
Price Tercile	1	2	3	4	5	1	2	3	4	5
1	9.5	4.8	11.1	8.2	28.3	6.1**	1.5	7.8	4.9	24.9**
2	7.2	4.0	3.3	16.2	13.1	3.9	0.7	0.0	12.9**	9.8*
3	2.7	3.2	1.4	17.4	**36.8**	-0.6	-0.2	-1.9	14.1**	**33.5*****

- ***Red-Zone or "R-zone"*** = Asset price growth and credit growth both high

CRISES IN AND OUT OF THE *R-ZONE*

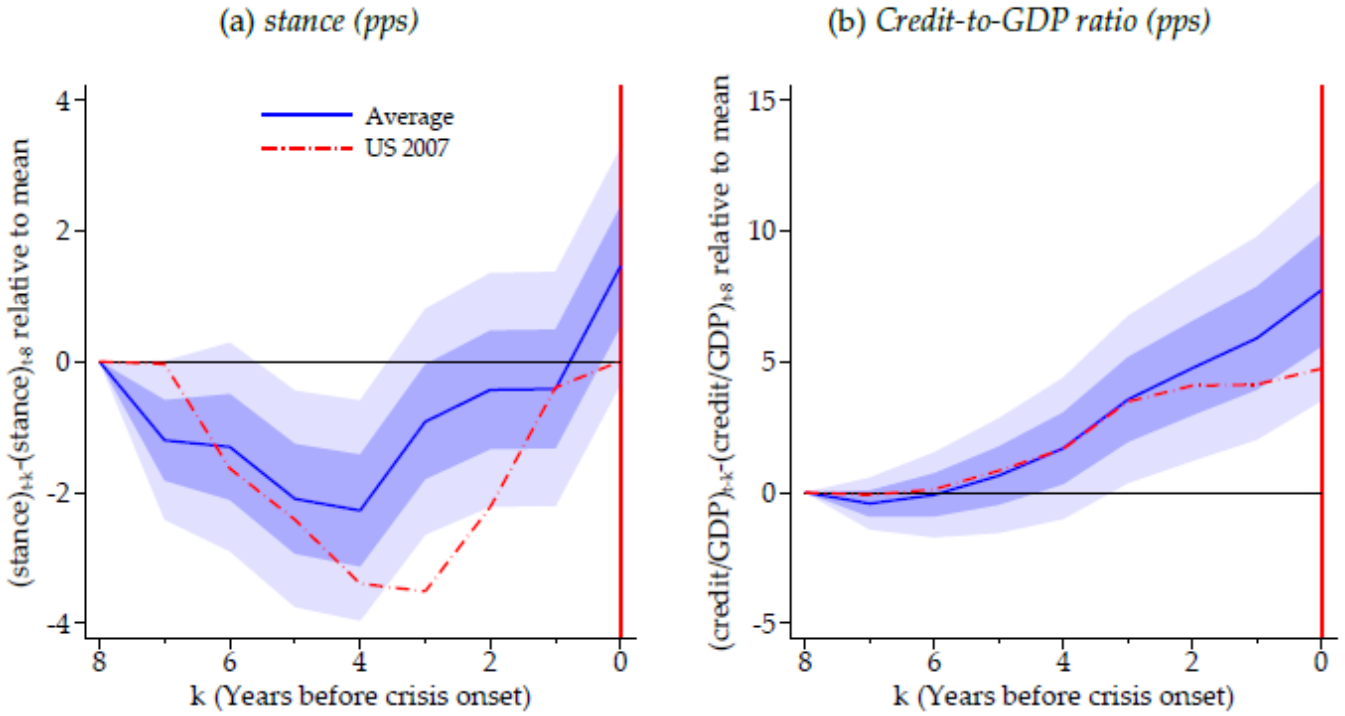
GRIMM ET AL (2023): LOOSE MONETARY POLICY AND FINANCIAL INSTABILITY

- Using data on 18 advanced economies over 150 years 1870-2020, find that periods of easy monetary policy (defined as $r < r^*$) raise likelihood of a financial crisis over the following several years.

- Mechanism: loose policy seems to lead to overheated financial markets.
  - Buildup in both asset prices and credit growth—i.e., loose policy tends to put countries in the R-zone.

LOOSE MONETARY POLICY AND FINANCIAL INSTABILITY

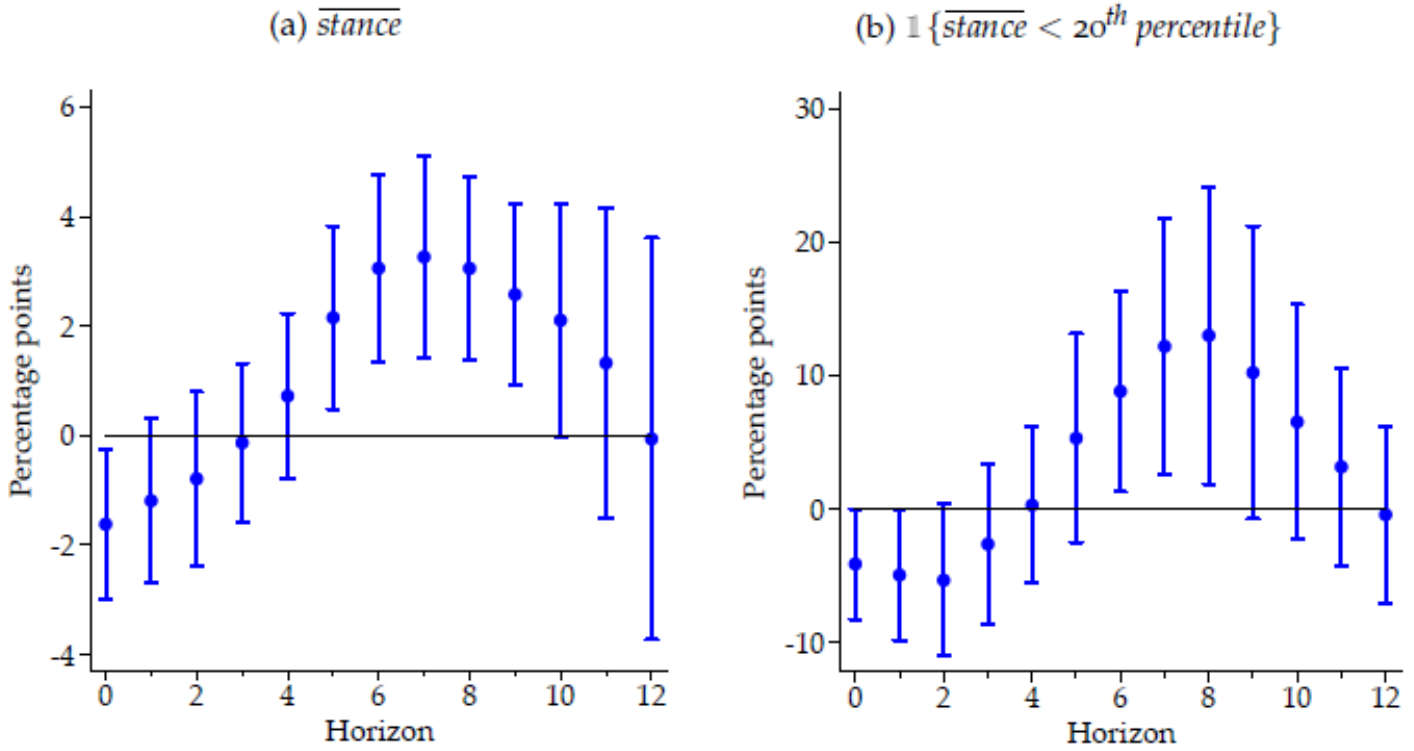
Figure 1: *The stance of monetary policy and credit growth before financial crisis events.*



Notes: In this figure, the data, including crisis event definitions, are taken from the JST Macrohistory Database, as described later. The solid blue line shows estimates of β_k of $(y_{i,t-k} - y_{i,t-8}) = \alpha_k + \beta_k \mathbb{1}\{crisis_{i,t} = 1\} + e_{t-k}$. $crisis_{i,t}$ is a dummy that is equal to 1 if a financial crisis starts in country i in year t and 0 otherwise. y refers to *stance* $= r - r^*$ (left panel), as defined in the text; or credit-to-GDP ratio (right panel), based on the JST total loans series. The estimation of r^* is described below in section 2. Shaded areas indicate 95% (light) and 68% (dark) confidence intervals. The dashed red line shows demeaned changes in the two variables before the U.S. Great Recession.

LOOSE MONETARY POLICY AND FINANCIAL INSTABILITY

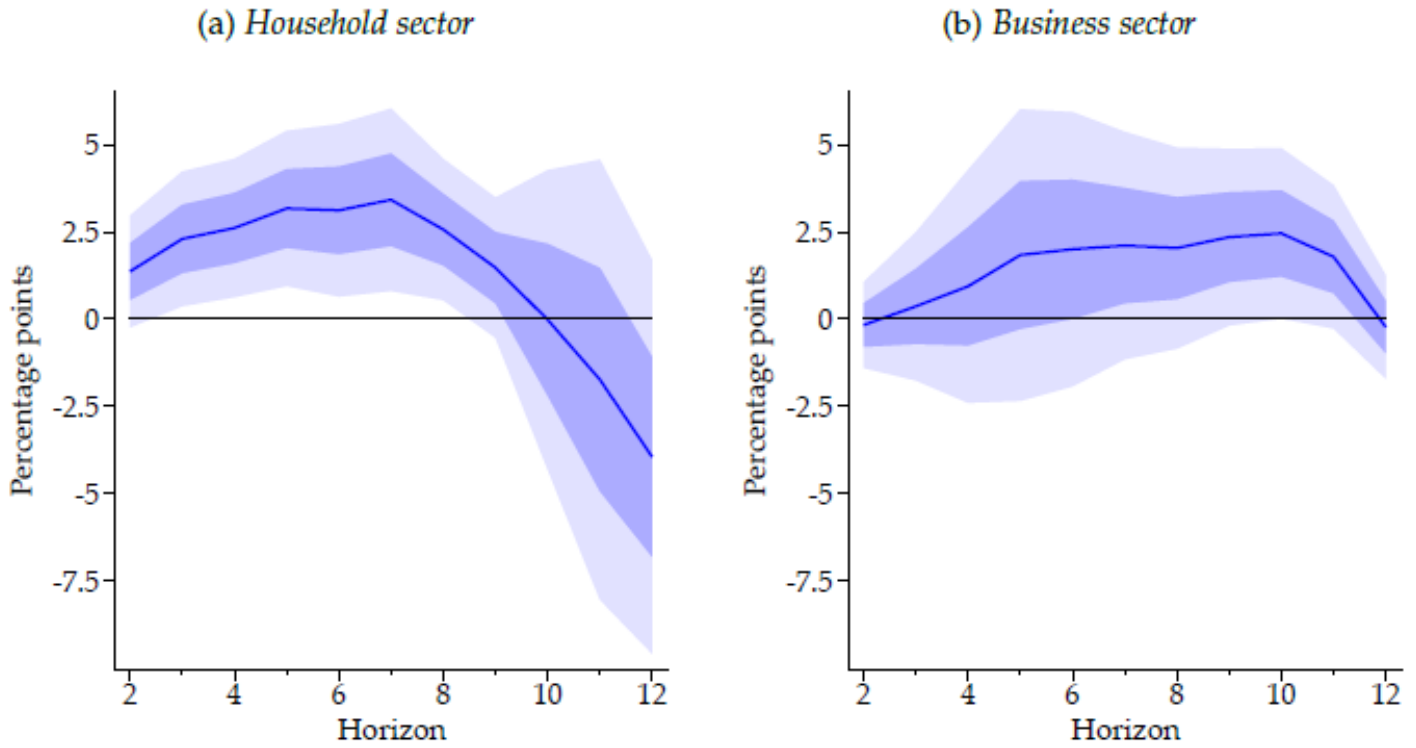
Figure 3: *The connection between loose monetary policy and financial crises.*



Notes: Define $crisis_{i,t}$ as a dummy that is equal to 1 if a financial crisis starts in country i in year t and zero otherwise. Panel (a) shows estimates of $\{-100\beta^h\}_{h=0}^{12}$ of equation (5) with $B_{i,t} = \max\{crisis_{i,t}, crisis_{i,t+1}, crisis_{i,t+2}\}$ and $b_{i,t} = crisis_{i,t}$. Panel (b) replaces the continuous variable $\overline{stance}_{i,t}$ by the binary variable $\mathbb{1}\{\overline{stance}_{i,t} < 20^{th}\ percentile\}$ and shows estimates of $\{100\beta^h\}_{h=0}^{12}$. Bars indicate 95% confidence intervals based on Driscoll-Kraay (1998) standard errors with h lags.

LOOSE MONETARY POLICY AND FINANCIAL INSTABILITY

Figure 6: *The connection between loose monetary policy and post-WWII R-zones.*



Notes: The figure shows estimates of $\{-100\beta^h\}_{h=2}^{12}$ of model (5) with R-zones as defined in equation (6) as the outcome variable. b is replaced by annual changes in the two continuous variables on which the binary variable is based. Only data for the post-1949 period is used. Shaded areas indicate 95% (light) and 68% (dark) confidence intervals based on Driscoll-Kraay (1998) standard errors with h lags.

HOW MUCH HELP IS REGULATION?

- Regulation is natural first line of defense against the damage caused by credit booms and busts. But several centuries of financial crises suggest it is unlikely to be a panacea.
  - Lessons from SVB?

- Moreover, the macroprudential toolkit—and its likely efficacy—varies considerably across countries.
  - As a function of political economy: e.g., is it feasible to implement time-varying LTV or DTI caps on mortgage loans? Or to implement counter-cyclical capital buffer?
  - And the extent to which the economy is bank-dominated: harder to effectively regulate non-bank credit creation.

- At least in some jurisdictions, it's difficult to argue that post-crisis regulatory reforms have fundamentally tamed the credit cycle.
  - Though they have undoubtedly been helpful, and likely reduce the probability of extreme systemic crises involving the largest intermediaries.

IMPLICATIONS FOR MONETARY POLICY: A SIMPLE MODEL

- The usual IS curve with aggregate demand shocks:

$$y_t = y^* - \gamma(r_t - r^*) + \epsilon_t$$

Central bank's objective function:

$$min \sum_{t=0}^{\infty} E\,(y_t - y^*)^2$$

- In this setting, can stabilize perfectly by leaning against demand shocks:

$$r_t = r^* + \frac{\epsilon_t}{\gamma}$$

ADDING FINANCIAL CONDITIONS

- Modified IS curve:

$$y_t = y^* - \gamma((r_t + s_t) - (r^* + s^*)) - \beta(s_t - s_{t-1}) + \epsilon_t$$

  - s_t is the credit spread at time t.
  - $-\beta(s_t - s_{t-1})$ is "credit bites back" term: *changes* in spreads, not just levels, matter.

- Monetary policy affects financial conditions (e.g., via reaching for yield):

$$s_t = s^* + \theta(r_t - r^*) + v_t,$$

- When $\beta = 0$ (no credit-bites-back) policy attends to financial conditions, but can still perfectly stabilize output period-by-period:

$$r_t = r^* + \frac{\epsilon_t}{\gamma(1+\theta)} - \frac{v_t}{(1+\theta)}$$

WHEN CREDIT BITES BACK

- Now consider two-period version where $\beta > 0$, where there is a negative demand shock at time 1, and where ZLB may bind at time 2, so that policy cannot offset all potential damage to real economy at this time.

- **Proposition:** If the ZLB binds at time 2, then: (i) the optimal policy rate at time 1 is higher than it would be if the ZLB were not binding at time 2, i.e., $r_1(ZLB) > r_1^s$; (ii) output at time 1 is lower than it would be if the ZLB were not binding at time 2; and (iii) $\frac{dr_1(ZLB)}{d\varepsilon_1} < \frac{dr_1^s}{d\varepsilon_1}$, so that it is no longer optimal for the central bank to fully offset negative time-1 demand shocks.

- Intuition: if central bank cuts rates at time 1 enough to fully stabilize, this will overheat markets and create potential drag on time-2 output that cannot be offset if ZLB binds at time 2.

- This is not about policy "leaning against the wind" of an exogenous sentiment shock. Here, central bank is driver of changes in risk premiums.

DON KOHN SAW THE SIGNS

- From March 2004 FOMC transcript:

"A second concern is that policy accommodation—and the expectation that it will persist—is distorting asset prices. Most of this distortion is deliberate and a desirable effect of the stance of policy. We have attempted to lower interest rates below long-term equilibrium rates and to boost asset prices in order to stimulate demand. But as members of the Committee have been pointing out, it's hard to escape the suspicion that at least around the margin some prices and price relationships have gone beyond an economically justified response to easy policy. House prices fall into this category, as do risk spreads in some markets and perhaps even the level of long-term rates themselves, which many in the market perceive as particularly depressed by the carry trade or foreign central bank purchases. If major distortions do exist, two types of costs might be incurred. One is from a misallocation of resources encouraging the building of houses, autos, and capital equipment that won't prove economically justified under more-normal circumstances. Another is from the possibility of discontinuities in economic activity down the road when the adjustment to more sustainable asset values occurs. Neither of these concerns, in my view, is sufficient to overcome the arguments for remaining patient awhile longer."

IMPLICATIONS FOR POLICY PROCESS

- Need better summary measures of those financial-market risk premiums that are most useful for capturing credit-bites-back effects.
  - Status quo practice seems to be that if multiple indicators are not flashing red, just ignore it.
  - Contrast with more pre-emptive early-intervention approach to inflation.

- History-dependence in r*: easy policy creates a boom in asset prices, may corner policymakers into keeping policy easy for fear of damaging reversal.
  - Complementary to other stories of hysteresis in r*: durable goods, mortgage refinancing.

- International considerations (Rey 2013): if policy-induced changes in risk premiums are correlated across countries, individual central banks have less effective independence.

CORRELATIONS OF TERM PREMIUMS ACROSS COUNTRIES

Table 1. Correlations between one-month changes in one-year and ten-year U.S. and advanced economy government bond yields.

The left column shows the correlation of one-month changes in one-year yields between U.S. government bonds and those from, respectively: Australia, Canada, Switzerland, Germany, Great Britain, and Japan. The right column repeats the exercise for ten-year yields. The sample period runs from January 1998 to December 2021.

Country	ΔUSD 1Y	ΔUSD 10Y
ΔAUD	0.4248	0.7256
ΔCAD	0.7129	0.8371
ΔCHF	0.4250	0.5934
ΔEUR	0.5266	0.7339
ΔGBP	0.5587	0.7682
ΔJPY	0.1776	0.3258

THERE ARE MANY CAVEATS

- Research is not yet at a stage where it can offer quantitative guidance to monetary policymakers.

- Nevertheless, some qualitative insights:
  - QE 3 era logic: if unemployment is 8% and you are not courting some financial-stability risk with aggressive policy, you're probably not trying hard enough.
  - November 2019: if unemployment is 3.5% and inflation is just a bit below target, financial-stability considerations loom relatively larger.
    - With flat Phillips curve, may have to push very hard on financial conditions to get inflation to move from 1.7% to 2.0%.

IN SUM

- Supply-driven credit booms—accompanied by aggressive pricing and erosion of credit quality—appear to play a big role in fluctuations in economic activity.
  - Across a wide range of sample periods, countries, and institutional arrangements.
  - Not just financial crises, but garden-variety recessions as well.
  - And monetary policy looks to be an important driver of these credit booms.

- Hard to believe that financial regulation alone can solve the problem.
  - Especially in economies where a large fraction of credit creation happens outside the regulated banking sector.

- This implies an intertemporal tradeoff for monetary policy. Qualitative point seems clear, but so far little guidance to offer on magnitudes. An important agenda for future research.
  - If Don Kohn could go back to March 2004 in a time machine, how much higher should he set the funds rate?
  - I don't know.