THE TWENTY-NINTH DUBROVNIK ECONOMIC CONFERENCE

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Financial Conditions and Risks to Economic Outlook

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Financial Conditions and Risks to Economic Outlook

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Motivation

Uncertainty is not just an important feature of the monetary policy landscape; it is the defining characteristic of that landscape. . . [T]he conduct of monetary policy in the United States at its core involves crucial elements of risk management, a process that requires an understanding of the many sources of risk and uncertainty that policymakers face and the quantifying of those risks when possible.

Chair Greenspan, 2003 Jackson Hole symposium

- Economic forecasts are usually about the conditional mean
- Risks around the central forecast are important
  - The FOMC commonly discusses downside risks
  - Many inflation targeting central banks publish forecast distributions
  - Surveys collect beliefs of probability distributions

How do we measure and quantify risks to the economic outlook?

"Vulnerable Growth" Approach

Basic idea: downside risks to real activity predictable conditional on current financial conditions

- Intuition: tighter financial conditions today $\Rightarrow$ credit contraction $\Rightarrow$ increased probability of economic downturn
- Methodology:
  1. Quantile regressions: how do certain features (particular quantiles) of the distribution relate to the level of financial conditions?
  2. Skewed t distribution: choose the best fit from a large family of candidate distributions to the predicted 10th, 25th, 75th, and 90th percent quantiles

"Vulnerable Growth" Literature

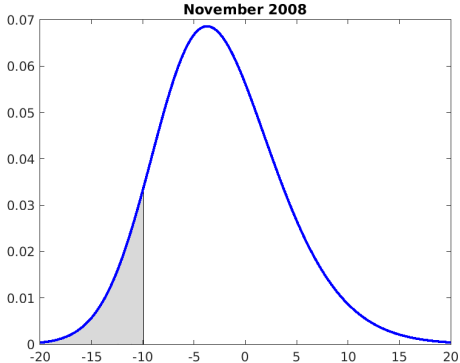
- U. S. real GDP growth: Adrian et al (2019), Adams et al (2021), Adrian et al (2021), Caldara et al (2021), Boyarchenko et al (2022)
- International evidence: Adrian et al (2022), Brownlees and Souza (2021), Figueres and Jarocinski (2020), Chavleishvili and Manganelli (2019)
- Unemployment: Adams et al (2021), Kiley (2018)
- Inflation: Adams et al (2021), Ghysels et al (2018), Lopez-Salido and Loria (2020)

Outline

1. Methodology
2. Baseline results for real GDP growth
3. International evidence
4. Risks to unemployment and inflation

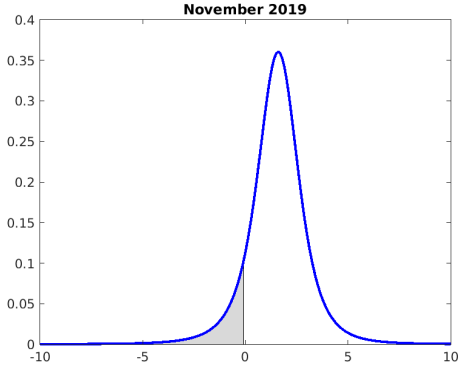
Methodology

Financial conditions and downside risk to growth



- Estimated distribution of average real GDP growth over the next four quarters as of November 2008
- Large downside risks to future real GDP growth when financial conditions are tight
- 10% probability that average real GDP growth over the next four quarters is below -9.9%

Financial conditions and downside risk to growth



- Estimated distribution of average real GDP growth over the next four quarters as of November 2019
- Small downside risks to future real GDP growth when financial conditions are loose
- 10% probability that average real GDP growth over the next four quarters is below -0.1%

Quantile regressions

- Choose coefficients β to minimize

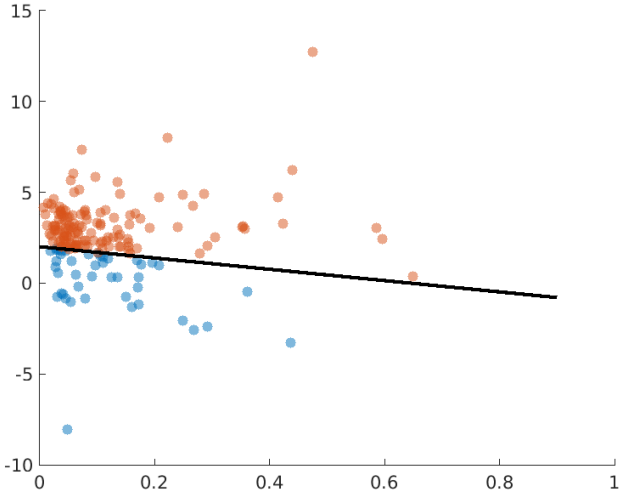
$$\beta_\tau = \underset{\beta \in \mathbb{R}^k}{\text{argmin}} \sum_{t=1}^{T} \left(\tau \cdot \mathbb{1}_{(y_{t+h} \geq \beta' x_t)} \left| y_{t+h} - \beta' x_t \right| + (1-\tau) \cdot \mathbb{1}_{(y_{t+h} < \beta' x_t)} \left| y_{t+h} - \beta' x_t \right| \right)$$

- Predicted value from the quantile regression is the inverse CDF

$$Q_{y_{t+h}|x_t}(\tau) = \beta'_\tau x_t$$

- Pros: flexibility in relationship between distribution of outcomes and predictors
- Cons: linear relationship conditional on quantile, estimation quantile-by-quantile
- Possible predictors: current (and lagged) economic conditions, current (and lagged) financial conditions, current (and lagged) credit conditions, ...

Quantile regressions

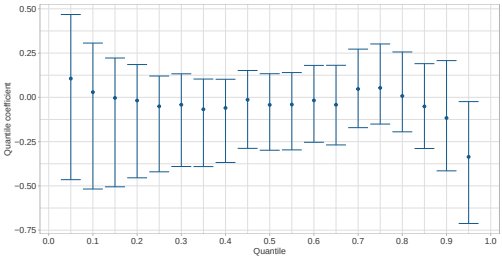


- OLS: minimize the squared errors between future real GDP growth and current financial conditions
- Quantile regression: minimize the absolute errors between future real GDP growth and current financial conditions, with differential weight
- Q25: observations above P25 receive lower weight (red)

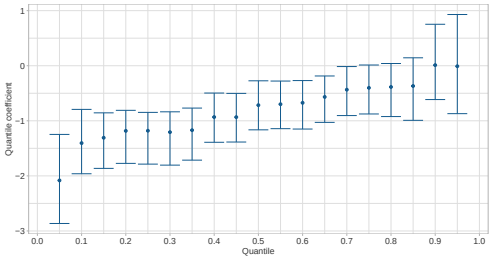
Baseline results for real GDP growth

Fact 1: Financial conditions predict downside risk to growth

Lagged real GDP growth



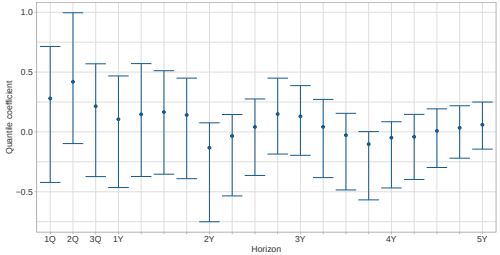
NFCI



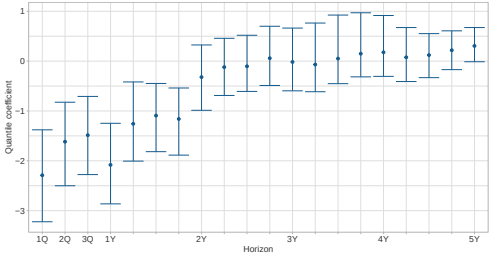
- Outcome: four-quarter-average future real GDP growth
- Financial conditions: Chicago Fed National Financial Conditions Index (NFCI)
  - Broad-based measure of financial conditions, both from a quantity and a price perspective
- Financial conditions predict lower quantiles but not the median/upper quantiles
- Tighter financial conditions (higher NFCI) $\Rightarrow$ more negative Q5

Fact 2: Relationship reverses in the longer run

Lagged real GDP growth

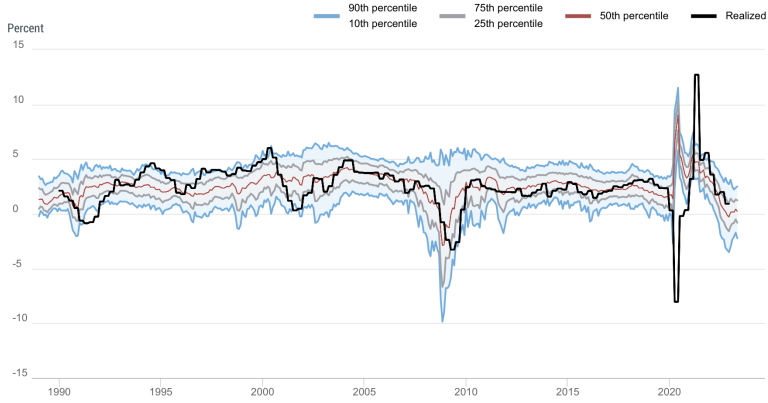


NFCI



- Outcome: annualized H-quarter-average future real GDP growth
- Looser financial conditions (lower NFCI) $\Rightarrow$ more positive Q5 in the short run but more negative Q5 in the longer run

Fact 3: Negative relationship between mean and volatility



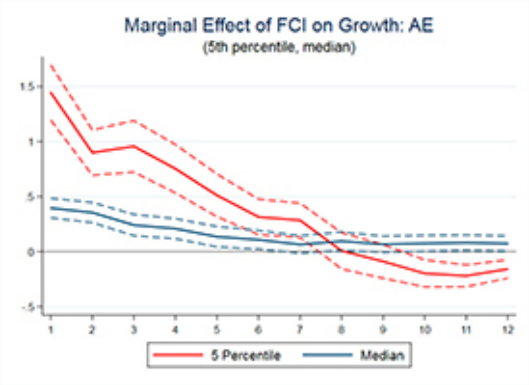
- Outcome: four-quarter-average future real GDP growth
- More variation in downside risk than upside risk $\Rightarrow$ declines in mean and increase in volatility when tight financial conditions

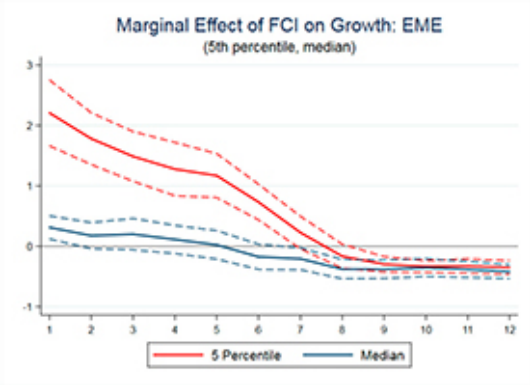
International evidence

Adrian et al. (2022): "The Term Structure of Growth-at-Risk"

- Study downside risks to growth in 11 AEs and 10 EMEs
- As a function of financial conditions (market prices) and credit growth
- Downside risks to medium- term growth higher when:
  - Financial conditions are loose
  - And especially when accompanied by rapid credit growth
  - "R-zone" of Greenwood et al. (2022): high probability of financial crises in 2-3 years time when low price of risk and rapid expansion of risk taking

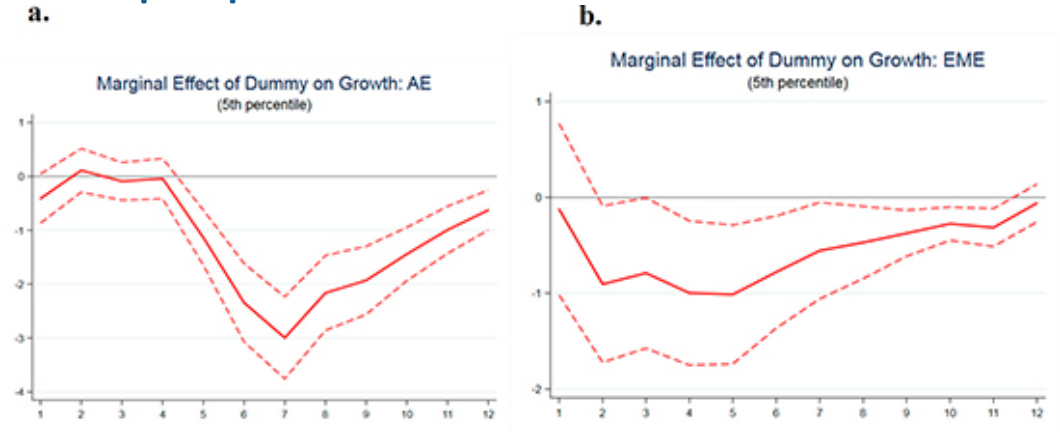
Relationship between financial conditions and growth reverses in the longer run





- Outcome: annualized H-quarter-average future real GDP growth
- Credit boom dummy: credit growth and FCI are each in the top three deciles of their distributions

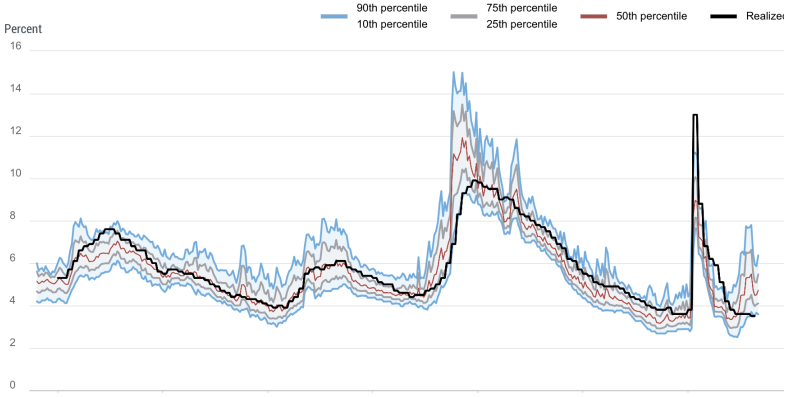
Relationship amplified in credit booms



- Outcome: annualized H-quarter-average future real GDP growth
- Looser financial conditions (higher valuations) $\Rightarrow$ more positive Q5 in the short run but more negative Q5 in the longer run

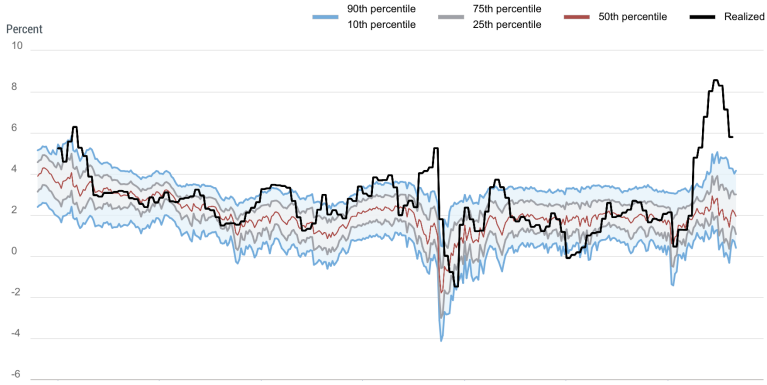
Risks to unemployment and inflation

Financial conditions predict upside risks to unemployment rate...



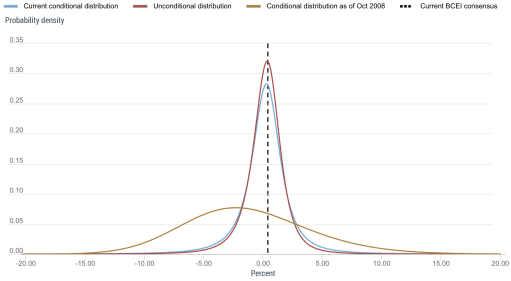
- Outcome: four-quarter-ahead average unemployment rate
- Tighter financial conditions $\Rightarrow$ higher median and larger right tail of unemployment rate in the future

. . . and downside and upside risks to inflation

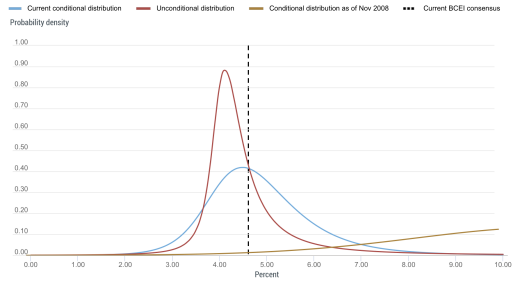


- Outcome: four-quarter-average future CPI inflation
- Tighter financial conditions ⇒ greater two-sided uncertainty about inflation in the future

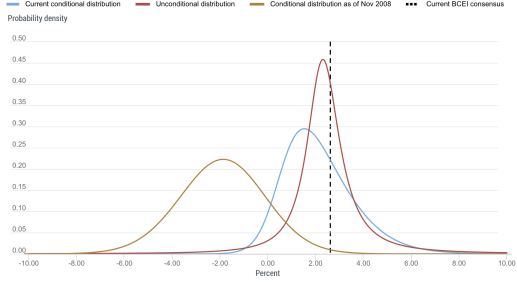
Real GDP growth



Unemployment



Inflation



Conclusion

Conclusion

- Timely characterization of risks to economic outlook important for policy makers and private sector decisions
- Growing evidence that financial conditions predict risks to economic activity
  - Across a range of outcomes: growth, (un)employment, inflation, capital flows, housing valuations,...
  - Across a range of economies
  - With sign of predictive relationship potentially changing over horizon
- Financial conditions can evolve rapidly and directly affect the likely set of economic outcomes

Outlook-at-Risk: monthly updates of conditional distributions of real GDP growth, unemployment, CPI inflation

`https://www.newyorkfed.org/research/policy/outlook-at-risk`