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Disclaimer

- The views expressed in this talk are my own.
- They may not be shared by others in the Federal Reserve System ...
- Especially my colleagues on the Federal Open Market Committee.

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Monetary Policy and Financial Stability

- Major element of monetary policy conversation:

Easy monetary policy could create risk of financial instability.

- My view: It is preferable to mitigate such risks using supervisory tools.

- But in reality: Supervision may leave residual systemic risk.

How should this residual risk affect monetary policy?

This Talk

- A **framework** to incorporate systemic risk mitigation into monetary policymaking.
  - Theme: Systemic risk creates a **mean-variance trade-off** for policy.

- A **suggestive calculation** based on the framework.

Outline

1. A Mean-Variance Framework
2. Suggestive Calculation
3. Conclusion

A MEAN-VARIANCE FRAMEWORK

Simple Model

- Monetary policymaker (MP)'s goal is to set a gap X equal to zero.
  - X could equal inflation minus target.
  - X could equal **natural** unemployment rate (UR) minus actual UR.
- Note well: X is based on **macroeconomic** outcomes.
- MP can increase X by raising accommodation A.
- After MP chooses A, X is also affected by a number of shocks, including shocks to the financial system.

The Central Banker's Problem

- MP's loss is given by the square of the gap (that is, X^2).
  - Standard: MP wants gap to equal zero.
  - Equally bad to have positive or negative gaps.
- Recall: X depends on shocks realized after A is chosen.
- MP chooses A so as to minimize the mean loss associated with A:

$$Mean(X^2|A)$$

Usual Approach

- Mean loss equals squared mean gap + variance of gap:

$$[Mean(X|A)]^2 + Var(X|A)$$

- Typical assumption: MP can't influence variance of shocks.

- Then, minimizing expected loss is same as minimizing squared mean gap:

$$[Mean(X|A)]^2$$

- Solution is to choose accommodation A^* that eliminates mean gap:

$$Mean(X|A^*) = 0$$

Incorporating Financial Stability Risks

- Suppose higher A increases the risk of financial instability that lowers X.

- Then, higher A increases $Var(X|A)$.

- MP's problem is to choose A so as to minimize:

$$[Mean(X|A)]^2 + Var(X|A)$$

- Now: MP's choice of A trades off mean versus variance.

Mean-Variance Trade-Off

- Trade-off means that MP's appropriate choice A^{**} will result in:

$$Mean(X|A^{**}) < 0$$

- That is, on average, the gap is negative under appropriate policy.

- MP gives up some mean X in order to get less risk in X.

- But exactly *how much* mean X should MP give up?

Comparing Two Monetary Policy Alternatives

- It is appropriate for MP to choose A over A^* if A reduces risk sufficiently relative to A^*:

$$Var(X|A^*) - Var(X|A) > Mean(X|A)^2$$

- Central banks know a lot about assessing the RHS – that is, the mean of X given choice A.
  - In my view: The RHS remains large for current choice of A.

- Key question is about the LHS:

How do we assess the difference in the risk implied by policy choices?

A Possibly Helpful Simplification

- Suppose that a crisis causes the gap X to fall by Δ.
- Suppose that monetary accommodation A implies that the probability of a crisis is $p(A)$.
- Then (assuming statistical independence of the crisis from other shocks):

$$Var(X|A^*) - Var(X|A) \approx [p(A^*) - p(A)]\Delta^2$$

- Then: Given any policy choice A or A^*, we need to assess:

The **implied probability** of a crisis and **its impact** Δ on X.

SUGGESTIVE CALCULATION

Crisis Impact

- Assume: the natural UR is approx. 5% in 2017.
- Assume too that, under current policy A^*, projected 2017 UR is **5%**.
  - That is, $E(X|A^*) = 0$ in 2017.
- Suppose too that a financial crisis would generate 2017 UR of 9%.
- In other words:

The impact Δ of a crisis is 4%.

According to the Survey of Professional Forecasters ...

- How likely is a crisis? As of 2014:Q1, the average SPF prediction is that:

$$\text{Pr}(UR \geq 9\% \text{ in } 2017) = 0.29\%$$

- So, if A^* is current monetary policy:

$$p(A^*) \leq 0.0029$$

  – It's an inequality because there are noncrisis sources of high UR.

(Implausibly) Highly Effective Monetary Policy

- Suppose monetary policy A' eliminates *any* chance of a crisis.

- That is, A' is a policy such that $p(A') = 0$.

- Then:

$$\begin{aligned}[p(A^*) - p(A')]\Delta^2 &= (0.0029)(0.0016) \\ &\approx (0.0022)^2\end{aligned}$$

- Should the FOMC be willing to adopt A' over A^* (when $E(X|A^*) = 0$)?

- Only if the (implausibly effective) policy A' doesn't increase projected gaps too much.

- Simple calculation: Only adopt tighter monetary policy A' if:

A' **raises UR to less than 5.22%(!!)**.

- Main take-away: **Current SPF forecasts imply that**

Little benefit to reducing or eliminating the probability of a crisis.

CONCLUSIONS

Financial Stability Framework: What We Need To Know

- Mean-variance framework implies that policymakers need to assess:

$$Var(X|A) - Var(X|A')$$

- Possibly could simplify this problem to gauging:

$$[p(A) - p(A')]\Delta^2$$

Assessing Crisis Probabilities

- Key measurement questions: what is the **probability** of a crisis?
- Current SPF forecasts suggest that it is very low under current policy.
- Some might argue that professional forecasters tend to underestimate probabilities of tail events.
- It would be useful to develop other approaches:
  - **Model-based** probability assessments of tail events
  - And **market-based** probability assessments of tail events