The Limited Power of Monetary Policy in a Pandemic

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Introduction

- COVID-19 was a shock of unprecedented size and **nature**.
- One key aspect: the interdependency between virus dynamics and economic outcomes.
- Central banks around the world responded swiftly and forcefully:
  - Interest-rate cuts.
  - Forward guidance.
  - Asset purchases.
  - New programs aimed at stabilizing financial markets and avoiding the disruption of the flow of credit.

What we do

- We develop a model where economic decisions and virus dynamics are interlinked: integrated New Keynesian (for macro and monetary policy) and SIR (for epidemiology) model.
- We ask two interrelated questions:
  - Should we expect monetary policy to transmit in the same way in a pandemic as in normal times?
  - Is easy monetary policy desirable in a pandemic?
- We focus on the roles of interest rate policy and forward guidance.

What we find

- A **"consumption vs health risk"** motive renders consumption less sensitive to real interest rate changes in a pandemic:
  - Less incentives to substitute intertemporally if risk of getting sick.
  - Strength of this effect depends on the state of the virus: weaker monetary policy at the height of the pandemic.
  - Persistence in the effects of MP: through infection dynamics, higher demand today means lower demand tomorrow.
- An easing of monetary policy conditions is **not desirable** from a welfare standpoint since the level of economic activity in the decentralized equilibrium is **too high**.

Model Summary

- Households (SIR dynamics)
  - Susceptibles
  - Infected: lower productivity
  - Recovered: long-lasting immunity
- Firms
  - Final good producers
  - Monopolistically competitive intermediate good producers
- Monetary authority subject to ELB

$$1 + R_t^{MP} = max \left\{ \left(1 + R^{MP}\right) \left(\frac{\Pi_t}{\Pi^*} \right)^{\delta_\pi} \left(\frac{Y_t}{Y} \right)^{\delta_y}, 1 + R_{min}^{MP} \right\}$$

Susceptible individuals

- The labor supply condition features an endogenous labor supply shock

$$w_t = \frac{\chi n_{s,t}^{1/\varphi} - \beta \frac{\partial \tau_t}{\partial n_{s,t}} \left[V_{i,t+1} - V_{s,t+1} \right]}{c_{s,t}^{-\sigma} + \beta \frac{\partial \tau_t}{\partial c_{s,t}} \left[V_{i,t+1} - V_{s,t+1} \right]}$$

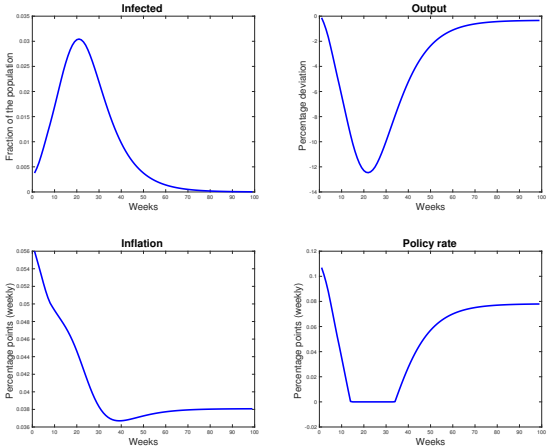
- A new consumption vs health risk motive appears in the Euler equation

$$c_{s,t}^{-\sigma} + \beta \frac{\partial \tau_t}{\partial c_{s,t}} \left[V_{i,t+1} - V_{s,t+1} \right] = \beta \frac{1 + R_t^{MP}}{\Pi_{t+1}} \left(c_{s,t+1}^{-\sigma} + \beta \frac{\partial \tau_{t+1}}{\partial c_{s,t+1}} \left[V_{i,t+2} - V_{s,t+2} \right] \right)$$

- Households prefer to consume when it is less risky to do so:
  - The probability of infection is increasing in one's consumption: $\partial \tau_t / \partial c_{s,t} > 0$.
  - Individuals would rather remain healthy than being sick: $V_{i,t+1} - V_{s,t+1} < 0$.

The baseline economy

- Pandemic of moderate size: shocks to π_{s3} capture social distancing in random interactions.
- No lockdowns. Perfect foresight.



Understanding the effects of MP

- Monetary policy affects real activity by changing the (expected) path of real interest rates.
- To build intuition, useful to conduct the following experiments. Assume

$$1 + rr_t = cste + \varepsilon^{rr}_{t,t-j}$$

- And...
  - Simulate a shock to $\varepsilon^{rr}_{t,t-j}$ for $t - j = 1, ..., 80$ and $t = 1, ..., 80$.
  - Simulate a shock to $\varepsilon^{rr}_{t,t-j}$ for $t - j = 1$ fixed and $t = 1, ..., 80$.
  - Simulate a shock to $\varepsilon^{rr}_{t,t-j}$ for $t - j = 1, ..., 80$ and $t = 50, ..., 130$.

Experiment 1

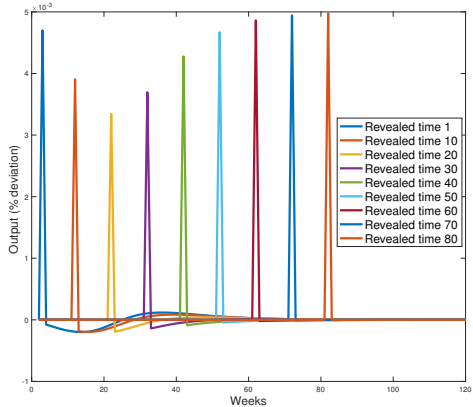


Figure: IRFs to unanticipated shocks at different dates (week 1 to week 80)

Experiment 2

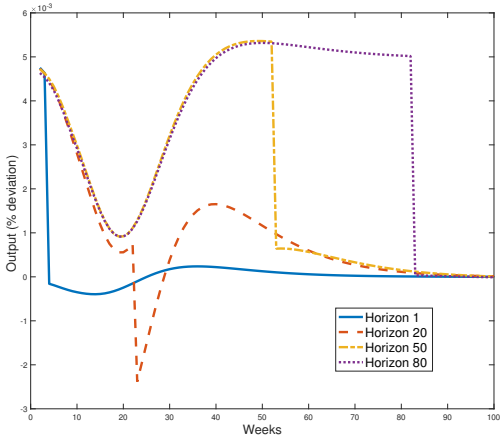
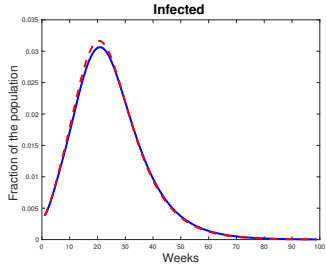
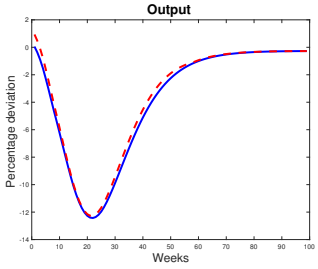
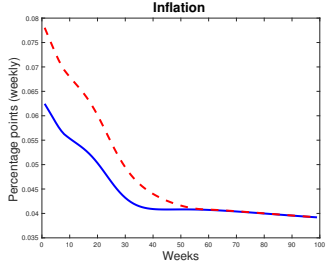


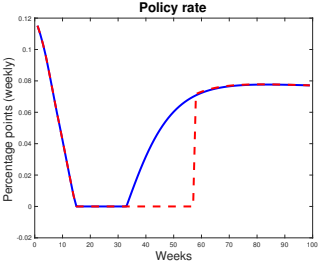
Figure: IRFs to anticipated shocks. Anticipated at date 1, horizon 1, 20, 50, 80.

Full experiment: Lift-off delayed by two quarters









Is an easing of monetary policy desirable?

- Trade-off between the limited gains in economic activity and the human costs of additional infections.
- Which inefficiencies arise in the decentralized equilibrium?
  - Price adjustment costs drive a wedge between C and Y.
  - Monopolistic competition drives a wedge between MRS and MPL.
  - **Infection externality:** infected individuals work and consume too much.
- Ideal policy: target infected individuals directly. If not possible, then the planner would rather engineer a fall in consumption and hours for *all* individuals.
- Since the level of economic activity is too high and inflation is above target, an easing of MP is not desirable: the delayed lift-off policy *reduces* welfare.

Our results in perspective

- James Bullard (March 2020): **the goal of macroeconomic policy is not to stimulate the economy** but rather strive to “keep everybody whole”.
- Levin and Sinha (2020): myopia of economic agents and limited commitment by CB especially relevant in COVID-19 environment -> **limits the effectiveness of forward guidance**.
- Woodford (2020): MP fails to stimulate demand of the right sorts when the effects of a shock are sectorally concentrated -> **interest rate cuts are not desirable**.