The Limited Power of Monetary Policy in a Pandemic

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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

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

- The labor supply condition features an endogenous labor supply shock

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

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

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

- 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 $\pi_{s3}$ 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

\[ 1 + rr_t = cste + \varepsilon_{t,t-j}^{rr} \]

- And...
  - Simulate a shock to \( \varepsilon_{t,t-j}^{rr} \) for \( t - j = 1, \ldots, 80 \) and \( t = 1, \ldots, 80 \).
  - Simulate a shock to \( \varepsilon_{t,t-j}^{rr} \) for \( t - j = 1 \) fixed and \( t = 1, \ldots, 80 \).
  - Simulate a shock to \( \varepsilon_{t,t-j}^{rr} \) for \( t - j = 1, \ldots, 80 \) and \( t = 50, \ldots, 130 \).
Figure: IRFs to unanticipated shocks at different dates (week 1 to week 80)
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”.


- 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.