The Effects of Monetary Policy Shocks on Inequality

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The views expressed in this paper are those of the authors and do not necessarily represent those of the IMF or IMF policy.
Extensive literature on inequality drivers

But mostly focusing on structural drivers:

• Technological progress (Bound and Johnson 1992; Acemoglu 2002);
• Demographics (Karahan and Ozkan 2013);
• Trade and Financial Openness (Feenstra and Hanson 2008)
• Labor market structure (Card 2001; Jaumotte and Osorio-Buitron 2015)

Recently, concerns about the impact of monetary policy:

• Accommodative monetary policy stance (Acemoglu and Johnson 2012; Stiglitz 2015)
Ambiguous effects

In theory, expansionary monetary policy may:

- Increase inequality
  - Boosting asset prices—top-income households hold larger shares
  - Increasing inflation—low-income households hold more liquid asset
- Reduce inequality
  - Benefiting borrower and hurting savers
  - Economic activity affects more labor earnings at the bottom of distribution

Empirical evidence

- Coibion et al. (2012) for the US: expansionary monetary policy reduces inequality
- O’Farrell et al. (2016): effect varies across 8 OECD countries
- Saiki and Frost (2014) for Japan: expansionary monetary policy increases inequality
Contribution

1. Effect of monetary policy on inequality constructing unexpected, and orthogonal to innovations in economic activity, changes in policy rates.

2. Examining the impact of monetary policy on inequality for a large sample of advanced and emerging market economies.

3. Assessing whether the effects of monetary policy shocks:
   - vary over time,
   - depend on the type of monetary shocks (tightening vs. expansionary),
   - the state of the business cycle,
   - the share of labor income to total income
   - the size of redistribution policies.

What we don’t do: assess the effects of unconventional monetary policy.
Key findings

• Contractionary (expansionary) monetary actions increase (reduce) inequality.

• The effect is larger for positive monetary policy shocks—especially during expansions,...

• …and in countries with higher labor share of income and lower redistribution.

• Changes in policy rates driven by an increase in growth are associated with lower inequality.
Orthogonal Monetary Policy Shocks (MP)

\[ FE_{i,t} = \alpha + \beta FE_{i,t}^{inf} + \gamma FE_{i,t}^{g} + MP_{i,t} \]

- \( FE^{i} \) is the difference between the actual policy rates and the rate expected in October of the same year (Consensus forecasts);
- \( FE^{inf} \) is the forecast error of inflation;
- \( FE^{g} \) is the forecast error of growth.

Advantage of this approach (Auerbach and Gorodnichenko 2013):
- eliminates the problem of “policy foresight” (Forni and Gambetti 2010; Leeper et al. 2012);
- reduces the likelihood of capturing the potentially endogenous response of monetary policy to the state of the economy.
Monetary Policy Shocks (MP)

Panel 1. Advanced Economies

Panel 2. Emerging market economies
Monetary Policy Shocks (MP)

Ours vs. R &R

Correlation=0.8
Effect on output and unemployment

Effect of a 100 bps exogenous increase in policy rates

Panel 1. Output (percent)

Panel 2. Unemployment (percentage points)

Note: t=0 is the year of the shock. Solid blue lines denote the response to an unexpected increase (or decrease) in monetary policy rates of 100 basis points, and dashed lines denote 90 percent confidence bands. Estimates based on equation (1).
Empirical framework

• Local projection method to assess the response of inequality (Gini) to monetary policy shocks:

\[ y_{i,t+k} - y_{i,t} = \alpha_i^k + \theta_t^k + \beta^k M_{P,i,t} + \pi^k X_{i,t} + \varepsilon_{i,t}^k \] (1)

• \( y \) is the log of market (net) inequality; \( X \) a set of control including lagged change in inequality and monetary policy shocks.

• Sample: unbalanced panel of 32 advanced and emerging market economies from 1990 to 2013.
Contractionary MP increases inequality

Effect of a 100 bps exogenous increase in policy rates

Note: \( t=0 \) is the year of the shock. Solid lines denote the response to an unanticipated increase in monetary policy rates of 100 basis points, and dashed lines denote 90 percent confidence bands. Estimates based on equation (1).
Robustness checks
Effect of a 100 bps exogenous increase in policy rates

Panel 1. Gross inequality
Panel 2. Pre-2008
Panel 3. Additional controls (fiscal shocks and recessions)

Note: t=0 is the year of the shock. Solid lines denote the response to an unanticipated increase in monetary policy rates of 100 basis points, and dashed lines denote 90 percent confidence bands. Estimates based on equation (1).
Effect on top income shares
Effect of a 100 bps exogenous increase in policy rates

Panel 1. Top 10 percent
Panel 2. Top 5 percent
Panel 3. Top 1 percent

Note: t=0 is the year of the shock. Solid lines denote the response to an unanticipated increase in monetary policy rates of 100 basis points, and dashed lines denote 90 percent confidence bands. Estimates based on equation (1).
Positive vs. negative shocks
Effect of a 100 bps exogenous increase in policy rates

Panel 1. Negative shocks
Panel 2. Positive shocks

Note: t=0 is the year of the shock. Solid lines denote the response to an unanticipated increase in monetary policy rates of 100 basis points, and dashed lines denote 90 percent confidence bands. Estimates based on the following equation:

$$y_{i,t+k} - y_{i,t} = \alpha_i^k + \theta_i^k + \beta_i^k D_{i,t} MP_{i,t} + \beta_i^k (1 - D_{i,t}) MP_{i,t} + \pi^k X_{i,t} + \varepsilon_i^{k,t},$$

where $D=1$ if the monetary policy shock is positive.
Growth driven vs. unanticipated shocks

Effect of a 100 bps exogenous increase in policy rates

Panel 1. Growth-driven shocks

Panel 2. Innovations in policy rates

Note: $t=0$ is the year of the shock. Solid blue lines denote the response to a growth-driven increase (innovation) of monetary policy rates of 100 basis points, and dashed lines denote 90 percent confidence bands. Solid yellow lines denote the unconditional (baseline) response. Growth-driven monetary policy shocks are identified as the forecast error in policy rates explained by news in growth and inflation—that is, the fitted value of equation (1). Innovations in policy rates are the forecast error in policy rates.
Recession vs. expansions
Effect of a 100 bps exogenous increase in policy rates

Panel 1. Recessions
Panel 2. Expansions

Note: t=0 is the year of the shock. Solid blue lines denote the response to an unexpected increase (or decrease) in monetary policy rates of 100 basis points, and dashed lines denote 90 percent confidence bands. Solid yellow lines denote the unconditional (baseline) response. Estimates based on equation:

\[ y_{i,t+k} - y_{i,t} = \alpha_i^k + \delta_t^k + \beta_1^k G(z_{it}) MP_{i,t} + \beta_2^k (1 - G(z_{it})) MP_{i,t} + \varepsilon_{i,t}^k \]

where \( G(z) \) is the smooth transition function. \( z \) is a (standardized) variable for the state of the economy.
Recession vs. expansions—positive shocks

Effect of a 100 bps exogenous increase in policy rates

Note: \( t=0 \) is the year of the shock. Solid blue lines denote the response to an unexpected increase (or decrease) in monetary policy rates of 100 basis points, and dashed lines denote 90 percent confidence bands. Solid yellow lines denote the unconditional (baseline) response. Estimates based on equation:

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\]

where \( G(z) \) is the smooth transition function. \( z \) is a (standardized) variable for the state of the economy.
Recession vs. expansions—negative shocks

Effect of a 100 bps exogenous increase in policy rates

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where \( G(z) \) is the smooth transition function. \( z \) is a (standardized) variable for the state of the economy.
Role of labor share
Effect of a 100 bps exogenous increase in policy rates

Panel 1. Very low labor share

Panel 2. Very high labor share

Note: t=0 is the year of the shock. Solid blue lines denote the response to an unexpected increase (or decrease) in monetary policy rates of 100 basis points, and dashed lines denote 90 percent confidence bands. Solid yellow lines denote the unconditional (baseline) response. Estimates based on equation:

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where \( G(z) \) is the smooth transition function of the labor share. \( z \) is a (standardized) variable for the labor share.
Role of redistribution
Effect of a 100 bps exogenous increase in policy rates

Note: t=0 is the year of the shock. Solid blue lines denote the response to an unexpected increase (or decrease) in monetary policy rates of 100 basis points, and dashed lines denote 90 percent confidence bands. Solid yellow lines denote the unconditional (baseline) response. Estimates based on equation: $y_{i,t+k} - y_{i,t} = \alpha_i^k + \delta_t^k + \beta_1^k G(z_{it}) MP_{i,t} + \beta_2^k (1 - G(z_{it})) MP_{i,t} + \epsilon_i^k$, where $G(z)$ is the smooth transition function of redistribution. $z$ is a (standardized) variable for redistribution.
Conclusions

- Monetary policy easing reduces inequality, but the effects vary over time, across the business cycles, and depend on the types of monetary shocks.

- Effects also depend on the share of labor income and redistribution policies.

- Recent accommodative monetary policy stance in many advanced economies may not only have helped boost demand but also contributed mitigating the increase in inequality driven by structural trends.
Thank you!
List of countries in the sample

<table>
<thead>
<tr>
<th>Advanced Economies</th>
<th>Emerging Market Countries</th>
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<td>Australia</td>
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Contractionary MP increases inequality

Effect of a 100 bps increase in policy rates

Note: $t=0$ is the year of the shock. Solid lines denote the response to increase in monetary policy rates of 100 basis points, and dashed lines denote 90 percent confidence bands. Solid yellow line denotes the unconditional (baseline) response. Estimates based on equation (1).
Role of initial inequality conditions
Effect of 100 bps exogenous increase in policy rates

Panel 1. Very high initial inequality
Panel 2. Very low initial inequality

Note: t=0 is the year of the shock. Solid blue lines denote the response to an unexpected increase (or decrease) in monetary policy rates of 100 basis points, and dashed lines denote 90 percent confidence bands. Solid yellow lines denote the unconditional (baseline) response. Estimates based on equation:

\[ y_{i,t+k} - y_{i,t} = \alpha_i^k + \delta_t^k + \beta_1^k G(z_{it})MP_{i,t} + \beta_2^k (1 - G(z_{it}))MP_{i,t} + \epsilon_{i,t}^k \]

where \( G(z) \) is the smooth transition function of the initial level of inequality.