Monetary policy and its distributive implications on wealth inequality in Canada

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Literature

- Hand-to-Mouth (HtM) households drive the aggregate response and changes in consumption to monetary policy changes (Kaplan, Moll, & Violante, 2018).
- A sizable share of Canadian households are HtM households (Alves et al., 2022).
- Households with mortgages drive the aggregate response for the US and UK (Cloyne et al., 2020).
- However, Albert and Gomez (2021) find that the portfolio channel plays a more significant role in the long run than housing in the US.

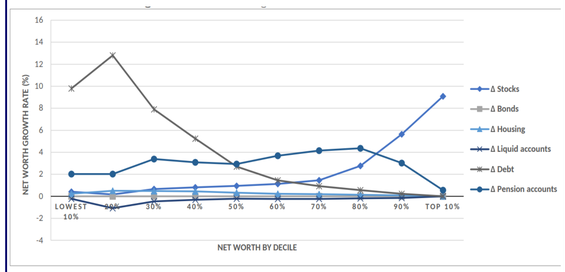


Figure 1. Net worth Growth Rate 6 months after the shock, Albert and Gomez (2021)

Underlying Economic theory & Accounting framework

Different Transmission Channels of Monetary Policy

Earnings Heterogeneity	Government Transfers
Portfolio	Debt
Housing	Fisher effect
Savings	Other subtler channels

Equation 1: Net Worth Growth Rate

$$w_{it} = s_i \left[\frac{E_i}{W_i} + \left(\left(r_t^{St} \frac{St_i}{W_i} \right) + \left(r_t^{B} \frac{B_i}{W_i} \right) + \left(r_t^{H} \frac{H_i}{W_i} \right) - \left(i_t \frac{L_i}{W_i} \right) \right) + \frac{I_i}{W_i} + \frac{\tau_i}{W_i} \right]$$

Equation 2: Average household net worth in real terms

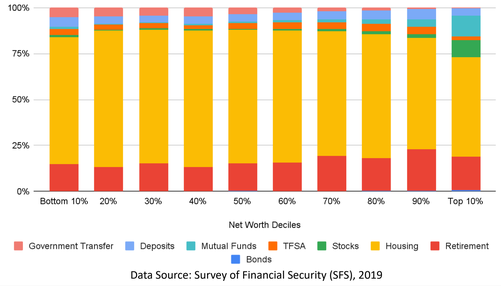
$$\frac{W_{it}}{P_t} = \frac{(1 + w_{it}) W_{it_1}}{(1 + \pi_t) P_{t-1}}$$

where subscript i represents different households.

- W: net worth
- w : growth rate of net worth (W)
- s: the average savings rate
- E: Earned/labor income
- I: Inheritance income
- τ: government transfers
- r_i^{St}: nominal return of stocks (St)
- r_i^{B}: nominal return of bonds (B)
- r_i^{H}: nominal return of housing (H)
- i_i: average interest rate paid by households for their liabilities (L)
- π_t: Inflation rate
- P_t: Price level

Figure 2

Composition of Household Assets by Net Worth Deciles



Data Source: Survey of Financial Security (SFS), 2019

Research Questions

- What are the distributive impacts of monetary policy changes in terms of wealth inequality on different deciles of the wealth distribution?
- Which transmission channels are most relevant as drivers of wealth inequality induced by monetary policy changes?
- Hypothesis: The housing channel will play a relatively significant role for Canada, as compared to the United States.

Key Findings

Following a 100 basis point contractionary monetary policy shock:

- Net worth decreases for all deciles.
- 10th, 20th and 30th percentiles experience the sharpest decrease in net worth (6.27%, 8.49%, and 7.72% respectively for the one year horizon).
- Key Factors: Housing price decline and increased debt liabilities.
- Stock and bond price changes have minimal impact.

Estimation Strategy

Step 1: Create a monetary policy shock series

- Use Instrumental Variable (IV) regression to extract the unanticipated component of monetary policy from the actual policy rate.
- IV: 3 month ahead Canadian Bankers' Futures Acceptance Rate (BAX).
- Regress the 3 month treasury bills rate on the Policy Rate with BAX as the IV.

Step 2: Macro-Analysis

- Estimate a 8 by 8 Proxy (SVAR) model and construct impulse response functions for our interest variables.
- Baseline model: CPI, IP, 3 months Treasury bills rate (Policy indicator) and the Yield spread (control variable).
- Additional variables: S&P Canada Aggregate Bond Index Total Return, S&P TSX Composite Total Return Index, New Housing Price Index, and the 5-year conventional mortgage lending rate.

Equation 3: Structural Form of the VAR

$$AY_t = C + \sum_{j=1}^{p} B_j Y_{t-j} + \varepsilon_t$$

Step 3: Micro empirical simulations

- Use the IRFs from the macro-analysis to simulate the effect of these changes on wealth inequality using household-level microdata from the Canadian Survey of Financial Security (SFS).
- Use accounting equation 1 to estimate the average net worth nominal return for each household.
  - Obtain ratios for the weight of these variables.
  - Multiple these ratios by the elasticities of each of these variables.
- Use accounting equation 2 to convert everything into real terms to get

Table 2. Macroanalysis: Means for Economic and Financial Variables of Interest

Variable	Mean	Standard Deviation	Source
Industrial Production (base year=1961)	100.95	10.66	Stats Canada
Consumer Price Index (base year=2002)	133.08	8.12	Bank of Canada
3-month treasury bills rate	0.95	0.81	Bank of Canada
S&P/TSX Composite index	54,044.48	12,499.95	Refinitiv
S&P Canada Aggregate Bond Index	454.54	38.91	Refinitiv
New housing price index (base= 2016/12)	103.66	0.54	Stats Canada
5-year conventional mortgage lending rate	4.00	0.54	Bank of Canada

The data has been used in monthly frequency from Jan, 2013 - Dec, 2022.

Monetary Policy Surprise

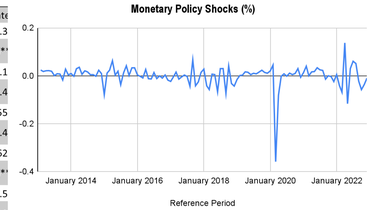
Table 1. IV Regression Results for the creation of monetary policy shocks

	dt_bills (change in t bills rate
bax	-0.3
	(5.51)**
bankrate	0.1
	-0.4
oir	-0.55
	-1.4
_cons	37.62
	(5.47)**
R2	0.5
N	11

* p<0.05; ** p<0.01

Figure 3

Monetary Policy Shocks (%)



Impulse Response Functions

Figure 4: Responses to a 100 basis point Contractionary Monetary Policy Shock

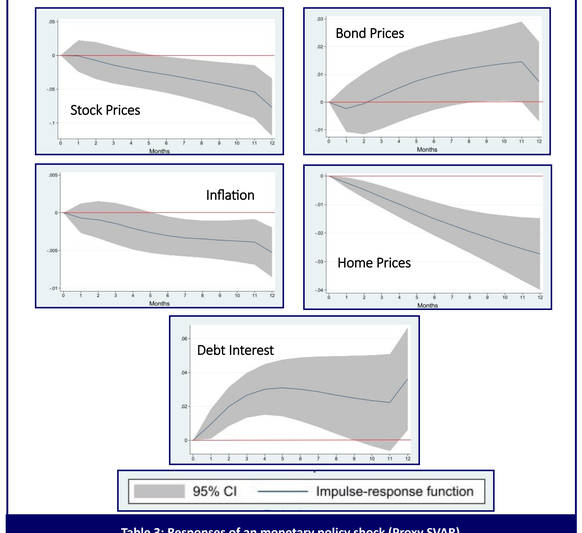


Table 3: Responses of an monetary policy shock (Proxy SVAR)

Months	Stock Prices	Bond Prices	Housing Prices	Debt Interest	Inflation Rate
1	-0.08%	-0.24%	-0.23%	0.96%	-0.07%
6	-2.86%	0.95%	-1.5%	3.02%	-0.3%
12	-7.65%	0.74%	-2.73%	3.62%	-0.52%

* Figures marked in red are significant given zero is not included in their confidence bands.

Contribution to Literature

This study shows that some of the conclusions of Albert and Gomez (2021) don't apply to Canada because of the relative significance of the housing channel.

Micro Empirical Simulations

Figure 5

Net Worth growth rate 6 months after the shock

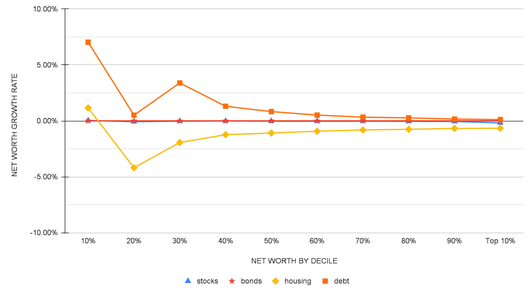


Figure 6

Net Worth growth rate 1 year after the shock

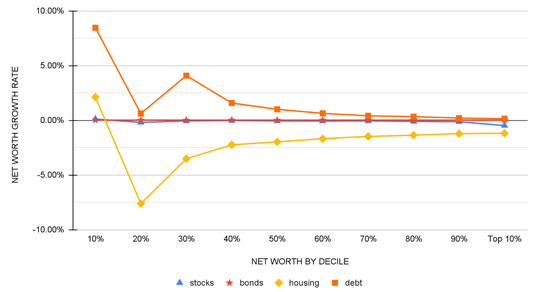
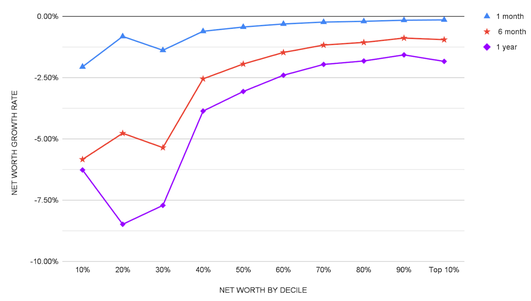


Figure 7

Net worth Growth rate over time



Conclusions & Future Implications

- A contractionary monetary policy shock increases wealth inequality.
- In Canada, housing prices are a key driver of these effects due to high housing-to-net-worth ratios.
- Household balance sheet composition plays a crucial role in transmitting monetary policy shocks across the wealth distribution.
- Policymakers must consider these distributional impacts when developing monetary policy to avoid exacerbating wealth inequality.

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