

Determinants of Household and Professional Forecasters' Inflation Expectations in India

Irfan Ali K C¹ and Masudul Hasan Adil²

¹Dr. BR Ambedkar School of Economics University, Bengaluru, India, School of Management, ²Indian Institute of Technology Mandi, Himachal Pradesh, India

INTRODUCTION

- Inflation Expectation as a policy tool

Transmission mechanism of the monetary policy in a forward-looking framework

"... our ability to forecast inflation and predict how inflation will respond to policy actions depends very much on our capacity to measure and to understand what determines the public's expectations of inflation." - Bernanke (2007)

- India adopted Inflation Targeting (IT) in May 2016

- We utilize quarterly survey data from the Reserve Bank of India (RBI), specifically the IESH and SPF to compare the determinants of inflation expectations among households and professional forecasters.

PRIMARY ANALYSIS

Variable	Abbreviation	Mean	Median	Maximum	Minimum	Std. Dev.
Survey of Professional Forecasters	SPF	6.7	5.9	8.9	3.4	1.7
Inflation Expectations Survey of Households	IESH	10.81	11	13.5	6.2	2
CPI Food Inflation	CPIF	7.86	7.82	18.83	-1.16	5.01
CPI Core Inflation	CPIC	7.08	6.15	14.41	3.37	2.78
Weighted Average of Call Money Rate	CMR	6.62	6.72	9.47	3.23	1.61
Output Gap	OG	4.87	4.98	5.6	0	0.78
Crude Oil Price	COIL	4.28	4.29	4.76	3.46	0.35
Volatility Index	VIX	2.96	2.86	4.03	2.44	0.35

- Average professional forecaster's expectations are much lower than households
- Higher household forecast error
- Lower volatility in the SPF

Correlation Analysis:

Variables	SPF	IESH	CPIC	CPIF	COIL	CMR	OG	VIX
SPF	1							
IESH	0.76	1						
CPIC	0.74	0.57	1					
CPIF	0.57	0.38	0.63	1				
COIL	0.54	0.63	0.24	0.03	1			
CMR	0.31	0.59	-0.07	-0.16	0.6	1		
OG	-0.31	-0.31	-0.3	-0.34	0.27	-0.15	1	
VIX	0.06	-0.15	0.21	0.55	-0.29	-0.15	-0.22	1

METHODOLOGY

Non- recursive Structural VAR

$$A_0 X_t = A(L) X_{t-1} + e_t$$

- The identification assumptions of the SVAR depends on economic theory to sort out the contemporaneous link between variables. The short-run identification matrix is given by the following:

$$\begin{pmatrix} u_t^{oil} \\ u_t^{ff} \\ u_t^{og} \\ u_t^{ic} \\ u_t^{ix} \\ u_t^{te} \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 & 0 \\ b_{12} & 1 & 0 & 0 & 0 & b_{72} \\ b_{13} & 0 & 1 & 0 & 0 & 0 \\ b_{14} & 0 & 0 & 1 & 0 & b_{74} \\ b_{15} & 0 & b_{35} & 0 & 1 & b_{75} \\ b_{16} & 0 & 0 & 0 & 1 & 0 \\ b_{17} & b_{27} & b_{37} & b_{47} & b_{57} & b_{67} & 1 \end{pmatrix} \begin{pmatrix} e_t^{oil} \\ e_t^{ff} \\ e_t^{og} \\ e_t^{ic} \\ e_t^{ix} \\ e_t^{te} \end{pmatrix}$$

Contemporaneous Relationships:

- Oil prices are the most exogenous in the system
- Oil price and IE affects food inflation
- Output gap can have contemporaneous effects from oil price
- IE and oil prices will affect CMR
- Core inflation has effects from the oil price, output gap & IE
- Oil price has a contemporaneous effect on VIX
- Finally, we impose zero restrictions on IE

Over-identified SVAR

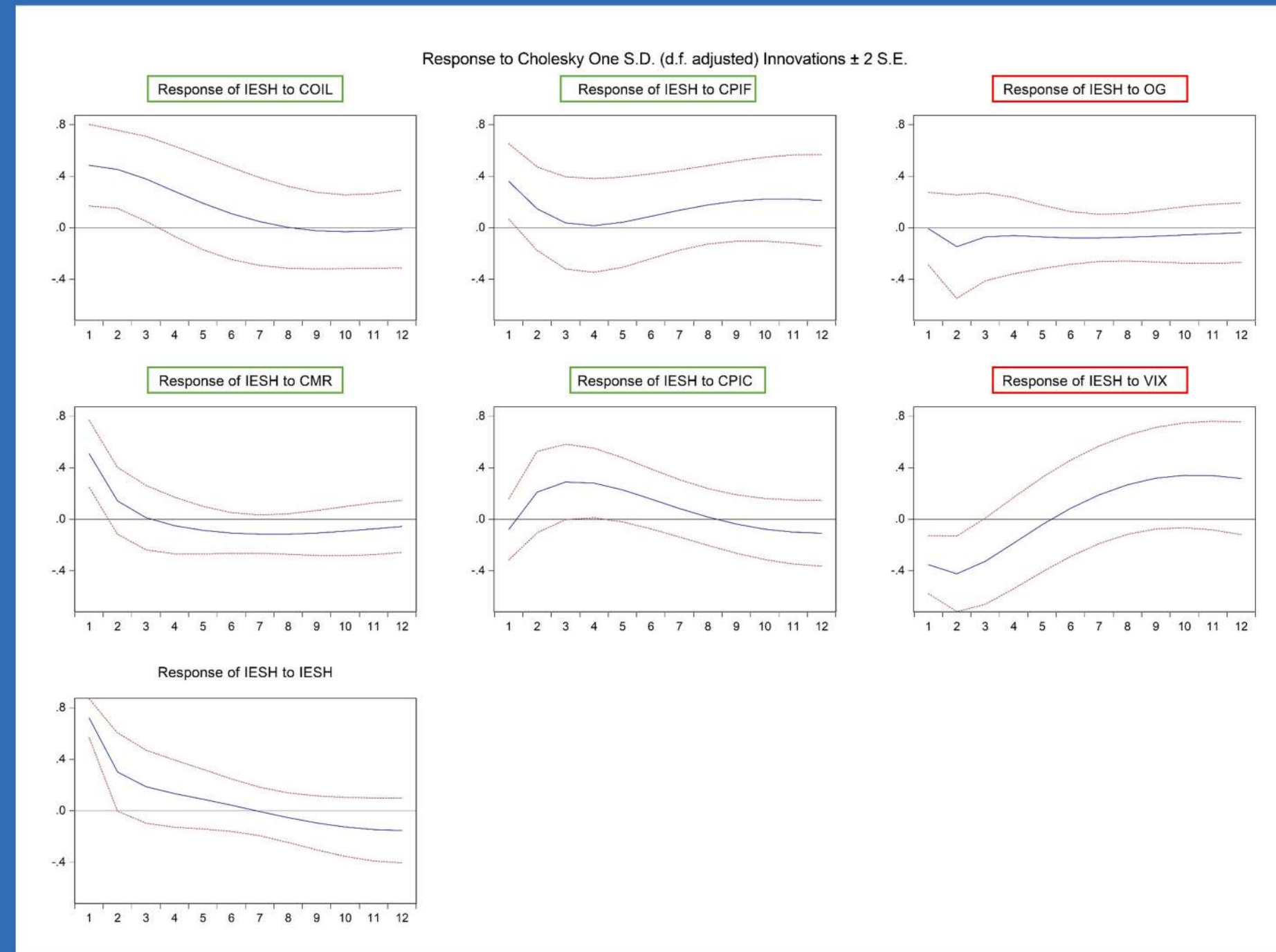


EMPIRICAL RESULTS

Impulse Responses: Each figures depicting the IRF represents a structural shock with one standard deviation magnitude with 2 standard error bands

Variance decomposition: VD separates the total variance in an outcome variable (Zaefarian et al., 2022).

RESULTS (IESH)



- Expectations are positively affected by shocks in oil prices, food inflation, core inflation, and interest rate.

- Higher sensitivity of household expectations to shocks in food prices

- A positive shock in the OG denotes excess supply, expected to increase the pressure on inflation expectations

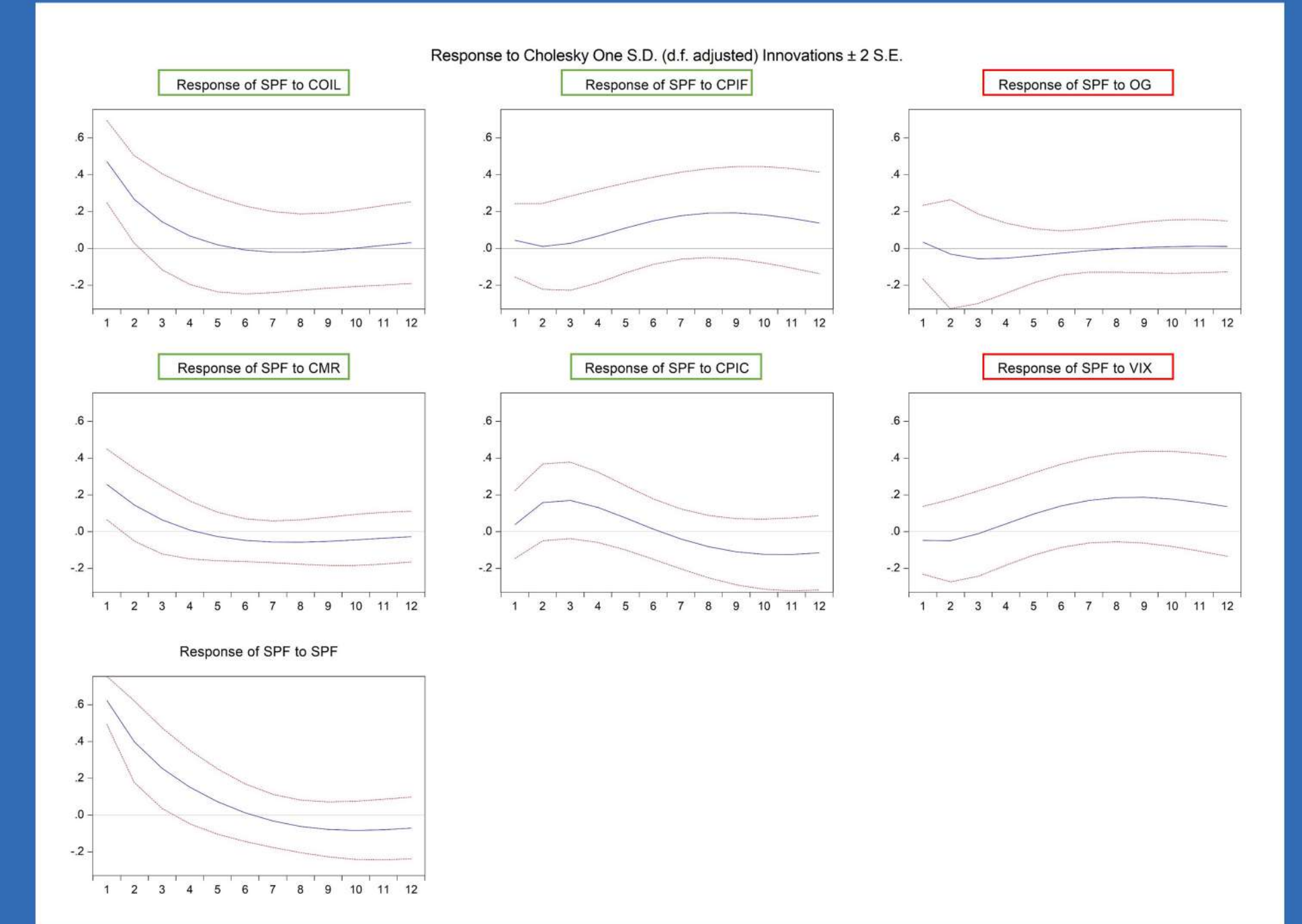
- Policy uncertainty significantly decreases inflation expectations on impact

Period	COIL	CPIF	OG	CMR	CPIC	VIX	IESH
1	14.54	19.13	0.51	1.57	6.19	4.64	53.41
2	17.84	15.33	4.08	1.12	4.46	13.18	43.98
3	19.3	12.92	4.5	0.98	5.32	17.42	39.55
4	19.67	11.82	4.54	1.18	6.68	18.67	37.43
8	18.65	11.19	4.35	3.16	8.46	19.36	34.83
12	16.14	11.31	3.96	3.09	7.32	24.93	33.25

- The most exogenous variable, oil prices, has a growing influence on the forecast error variances of inflation expectations and interest rates.

- Food inflation shows a higher impact on shocks to inflation expectations than core inflation.

RESULTS (SPF)



- Expectations are positively affected by shocks in oil prices, food inflation, core inflation, and interest rate.

Period	COIL	CPIF	OG	CMR	CPIC	VIX	SPF
1	32.32	0.05	0.38	2.23	14.88	0.01	50.15
2	30.23	0.03	0.35	2.04	11.42	0.06	55.86
3	28.72	0.06	0.6	1.82	10.13	0.06	58.61
4	27.78	0.32	0.79	1.84	9.76	0.17	59.33
8	23.58	5.94	0.79	3.52	8.4	5.92	51.84
12	19.51	10.18	0.98	3.93	7.38	11.17	46.85

- Oil prices and core inflation significantly contribute 47% of the variances in shocks toward inflation expectations

- It once again establishes food inflation's lesser contribution towards the professional forecast.

- The policy uncertainty turns out to be slightly less critical (11%) compared to the IESH model (25%).

DISCUSSION

Comparative Analysis

- CPIF and CPIC show a negative response to interest rate shocks in the IESH model
- In the SPF model, the response of CPIF to interest rate shocks is close to zero, while core inflation remains significantly negative
- VD analysis reveals that while food inflation significantly explains the variation in IESH, its impact on the variation of SPF is notably smaller
- The role of supply-side factors like food inflation, differ markedly between household and professional forecasts
- The OG's influence on both IESH and SPF is minimal, which is in line with the observed absence of excess demand during the study period
- IESH shows a more delayed and subdued response, which could indicate households' slower adjustment to economic uncertainty – depicts rational inattention (Sims, 2009)
- These differences underscore the varying sensitivities of households and professional forecasters to macroeconomic conditions, reflecting potentially divergent perceptions and reactions to similar economic signals.

Price Puzzle:

- Decline in food and core inflation associated with a positive shock in monetary policy

Self-Fulfilling Prophecy:

- A positive shock to inflation expectations significantly reduces inflation, however with a lag, hence we find absence of self-fulfilling prophecy.

Reaction to monetary policy shocks:

- Monetary policy can play an essential role in the formation of inflation expectations, as it reacts quicker than actual inflation

CONCLUSION

- Shocks from food and core inflations, the oil prices, and the interest rate raise inflation expectations of both household and professional forecasters in impact
- Oil prices hold most of the variances in inflation expectations in short and long horizons
- Households' expectations were found to be highly sensitive to shocks in food prices
- We found no supporting evidence for the presence of a price puzzle
- Self-fulfilling prophecy was observed
- Inflation expectations respond more promptly to monetary policy shocks than to realized inflation.

Presented at:

CNB Workshop on Households' Inflation Expectations: "Measuring Households' Inflation Expectations: Theory, Practice, Implications"
Prague, November 28, 2024