

Perceived Deflation Risk

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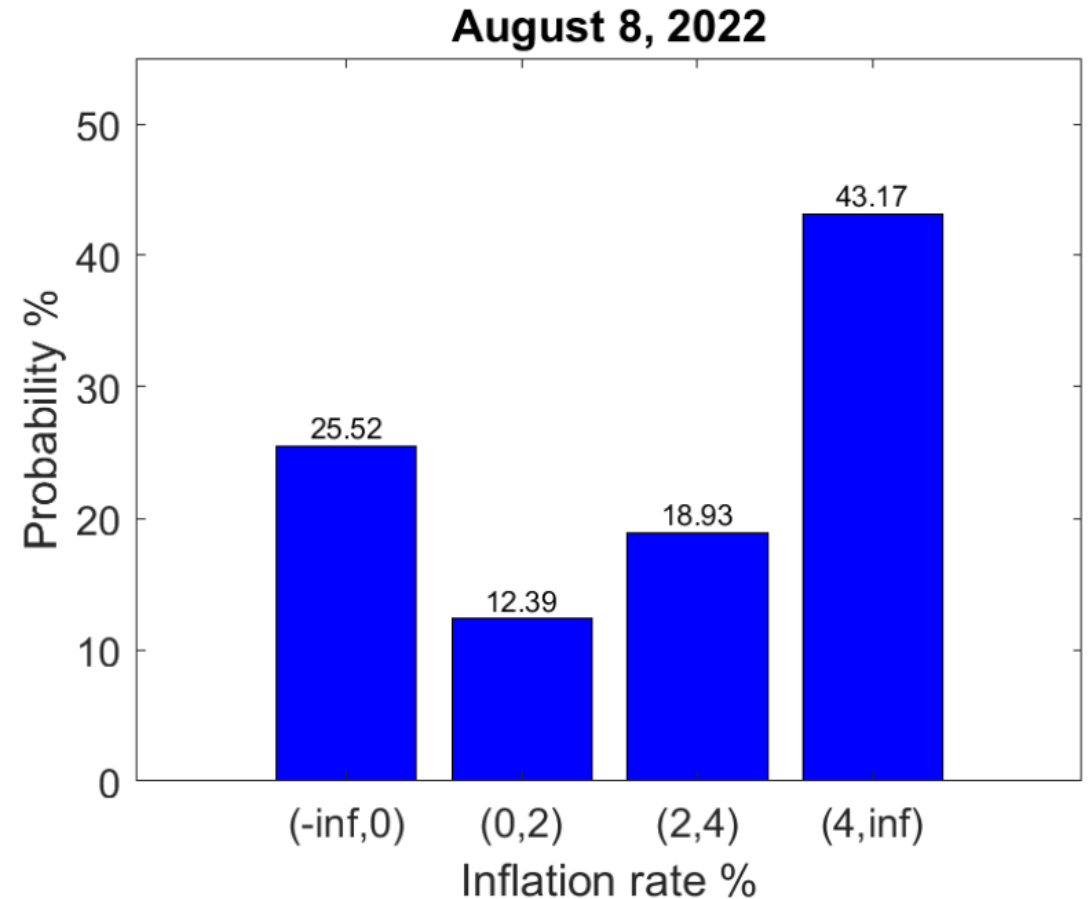


Motivation

- Role of subjective **inflation expectations** for the economy is widely analyzed in recent research (see the survey by Weber et al., 2022)
- Mostly focused on high-inflation scenarios
- Individuals' expectations associated with a **deflation scenario** are not well understood
- Reasons
 - **Almost no deflation internationally** in the last 40 years, no survey data before that
 - Typically very low probability assigned to deflation scenario in survey data

Motivation

- **This changed** during the recent high-inflation period
- Survey of Consumer Expectations respondents assigned an on average **25.52% probability to a deflation scenario** 3 years ahead
- CPI was at 8.5% at that time
- **Unique setting** allows us to characterize expectations associated with deflation



Research Questions

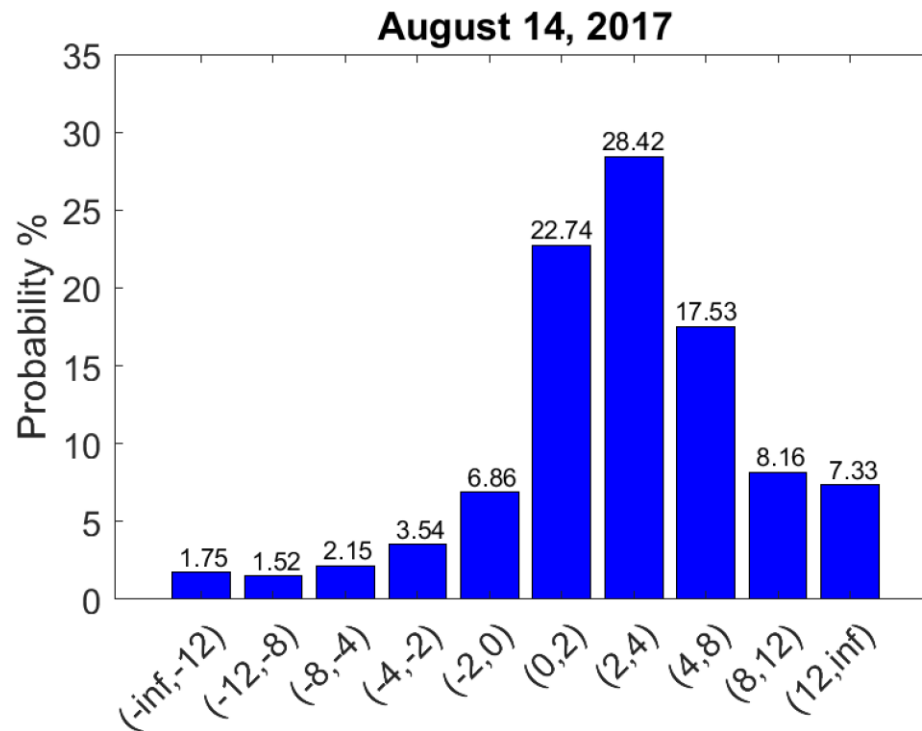
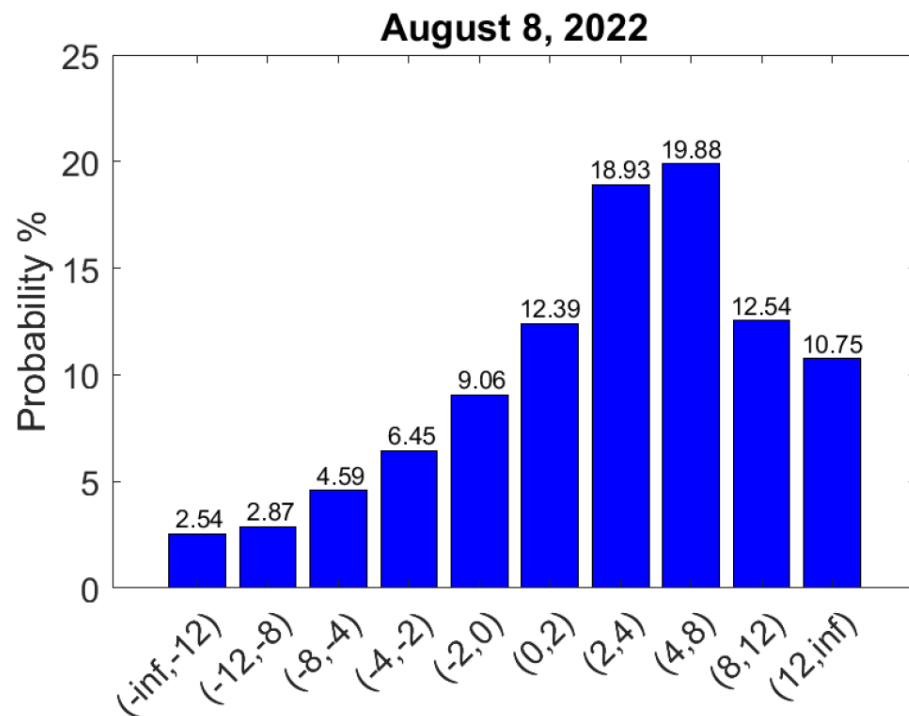
- Is high perceived deflation risk merely a result of high inflation uncertainty?
- Is high deflation risk perceived by consumers **shared by other agents**?
- What are the drivers of perceived deflation risk?
- What expectations do individuals with high perceived deflation risk have **about the economy in general**?
- Are individuals' expectations related to deflation consistent with any of the **leading economic theories**?

Survey of Consumer Expectations

- Launched in 2013 by the **New York Fed**, conducted monthly
 - Rotating panel of about 1,300 households
 - Respondents are asked
 - whether they expect inflation/deflation (0/1)
 - for their inflation/deflation point estimate
 - to **assign probabilities** to the scenarios of inflation or deflation being 12% or higher, between 8 and 12%, between 4 and 8%, between 2 and 4%, or between 0 and 2%
- one year and three years ahead
- Many other questions regarding respondents' **economic expectations**

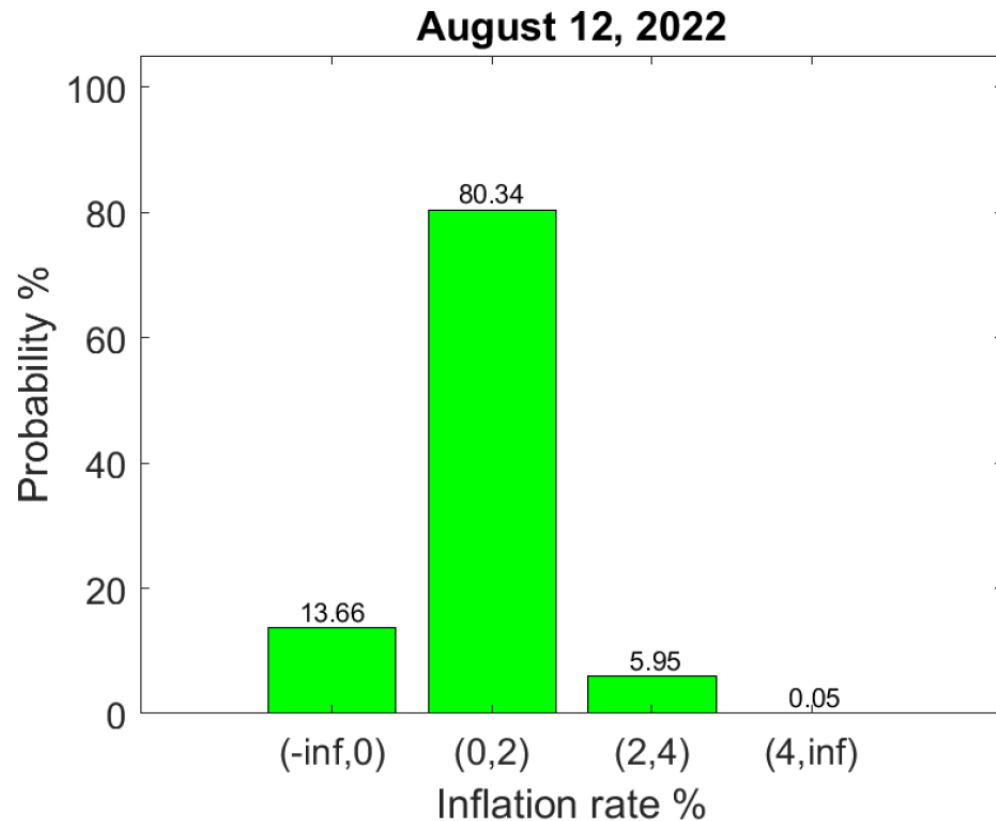
Inflation Uncertainty vs. Deflation Tail

- Is the high perceived deflation risk merely a result of **high inflation uncertainty**?

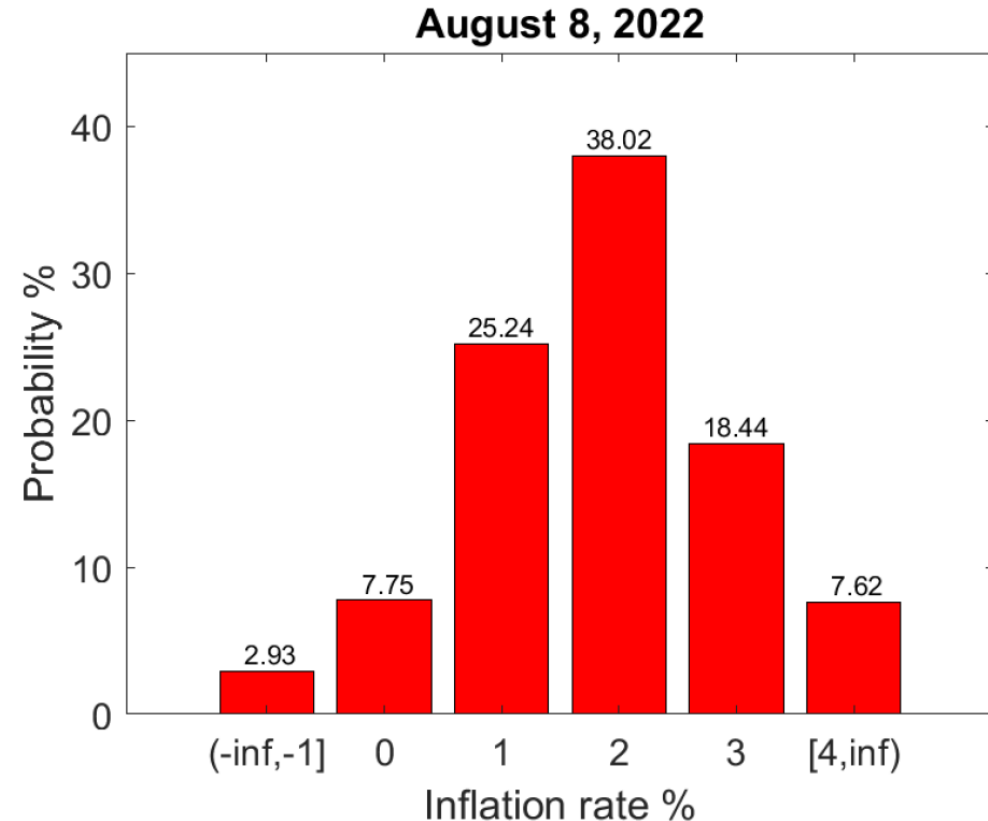


Professional Forecasters and Option Markets

- Is high perceived deflation risk shared by other agents?



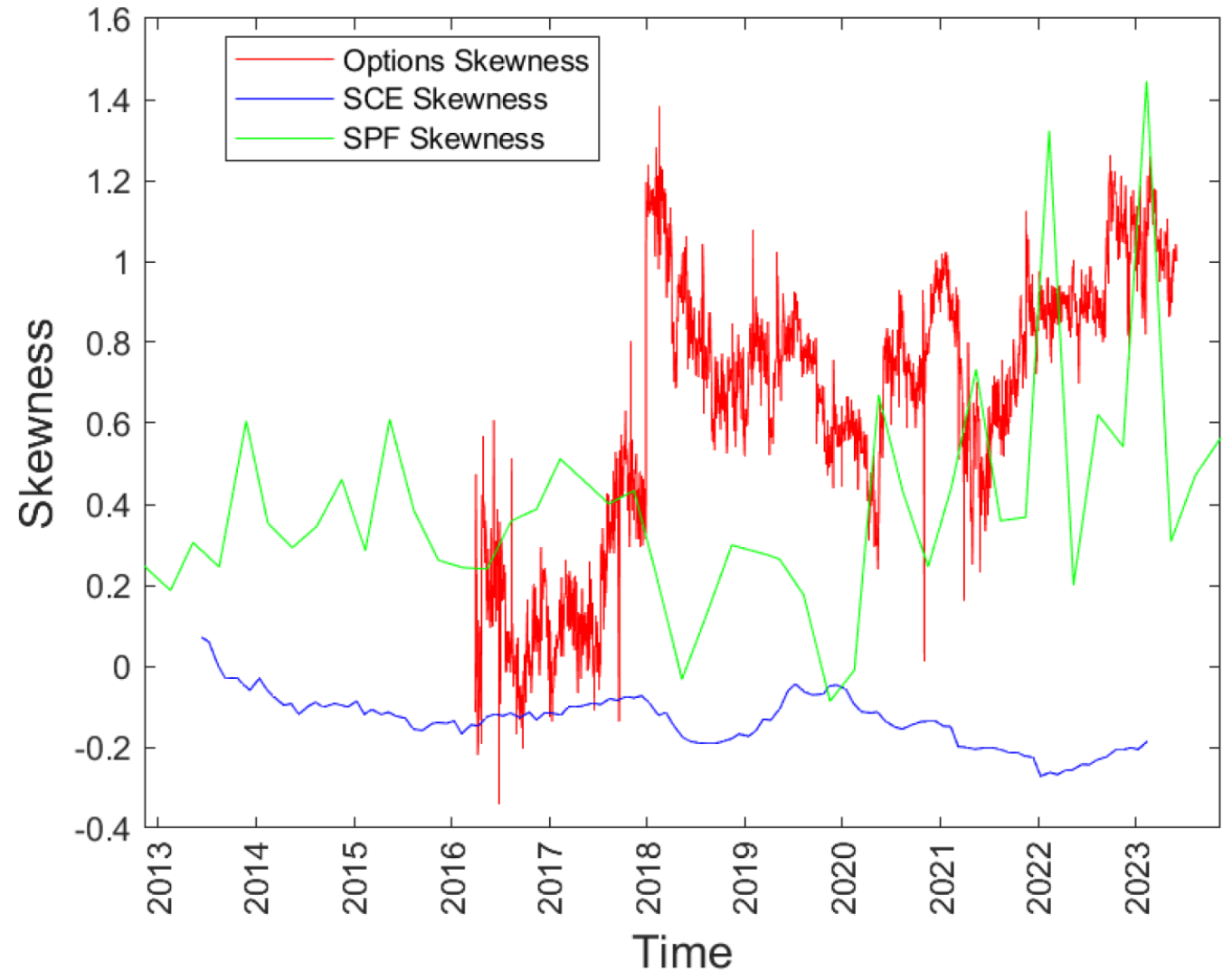
Survey of Professional Forecasters



Option-Market-Implied Density

Skewness of Inflation Distributions

- At each point in time, we compute the **average reported inflation distribution** and compute its skewness
- Skewness of SCE densities has become **negative since 2020**
- SPF and option densities have become more **positively skewed**



Drivers of Perceived Deflation Risk

- Do demographics, **employment status**, or financial situation explain higher perceived deflation risk?
- There is a clear **level effect**; for example, retirees perceive lower deflation probabilities

	(1) Defl. Prob.	(2) Defl. Prob.	(3) Defl. Prob.
Full time	-0.0205*** (0.000)	-0.0107** (0.042)	-0.0107** (0.041)
Part time	-0.00798 (0.111)	-0.00294 (0.548)	-0.00203 (0.678)
Looking for work	0.0188** (0.015)	0.0126* (0.087)	0.0124* (0.092)
Temp laidoff	0.0479*** (0.001)	0.0410*** (0.002)	0.0413*** (0.002)
On leave	0.0509*** (0.003)	0.0385** (0.036)	0.0383** (0.036)
Unable work	0.0479*** (0.000)	0.0230*** (0.009)	0.0236*** (0.008)
Retiree	-0.0438*** (0.000)	-0.0137** (0.015)	-0.0132** (0.018)
Student	0.0269*** (0.002)	0.0127 (0.127)	0.0122 (0.141)
Homemaker	0.0374*** (0.000)	0.0262*** (0.001)	0.0264*** (0.001)
Other	0.0161* (0.084)	0.0192** (0.036)	0.0198** (0.032)

Drivers of Perceived Deflation Risk

- However, there is no significant relation with the **increase** in deflation risk in 2022 and later
- High perceived deflation risk in the recent period is observed **across the board**

After 2022	0.0863*** (0.000)	0.0731*** (0.002)	0.0789*** (0.001)
Full time × After 2022	0.0166 (0.435)	0.0281 (0.197)	0.0225 (0.306)
Part time × After 2022	0.00667 (0.747)	0.0110 (0.602)	0.00580 (0.784)
Looking for work × After 2022	0.0118 (0.660)	0.0184 (0.497)	0.0169 (0.541)
Temp laidoff × After 2022	0.0174 (0.743)	0.0132 (0.809)	0.00767 (0.888)
On leave × After 2022	-0.0149 (0.751)	-0.00424 (0.927)	-0.0112 (0.812)
Retiree × After 2022	0.0348 (0.107)	0.0406* (0.066)	0.0340 (0.126)
Unable to work × After 2022	-0.0123 (0.663)	0.000551 (0.984)	-0.00782 (0.786)
Student × After 2022	0.0113 (0.673)	0.0160 (0.545)	0.00977 (0.708)
Homemaker × After 2022	0.0158 (0.578)	0.0275 (0.332)	0.0249 (0.390)
Other × After 2022	0.0229 (0.597)	0.0328 (0.452)	0.0296 (0.498)
Constant	0.170*** (0.000)	0.160*** (0.000)	0.160*** (0.000)
Demographic FE	N	Y	Y
State FE	N	N	Y
Observations	149324	147400	147071

Unemployment

- Do individuals associate a deflation with **higher unemployment**?

	(1)	(2)	(3)	(4)	(5)	(6)
	Unempl.	Unempl.	Unempl.	Unempl.	Unempl.	Unempl.
After 2022	4.140*** (0.000)	4.077*** (0.000)	4.081*** (0.000)	3.851*** (0.001)	3.800*** (0.001)	3.791*** (0.000)
Defl. Prob.	-1.598*** (0.006)	-1.325** (0.021)	-1.445** (0.012)			
Defl. Prob. × After 2022	-4.184*** (0.002)	-4.134*** (0.002)	-4.162*** (0.001)			
Defl. Ind.				-1.746*** (0.000)	-1.508*** (0.002)	-1.571*** (0.002)
Defl. Ind. × After 2022				-2.161** (0.032)	-2.226** (0.026)	-2.186** (0.026)
Constant	37.52*** (0.000)	37.49*** (0.000)	37.49*** (0.000)	37.46*** (0.000)	37.46*** (0.000)	37.45*** (0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	149029	147108	146779	150966	148989	148657

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Personal Job Insecurity

- Is deflation associated with **higher job insecurity**?

	(1)	(2)	(3)	(4)	(5)	(6)
	Prob. Los.	Prob. Los.	Prob. Los.	Prob. Los.	Prob. Los.	Prob. Los.
After 2022	-2.736*** (0.000)	-2.502*** (0.000)	-2.354*** (0.000)	-2.588*** (0.000)	-2.366*** (0.000)	-2.278*** (0.000)
Defl. Prob.	1.675*** (0.001)	1.354*** (0.005)	1.087** (0.018)			
Defl. Prob. × After 2022	-2.532*** (0.008)	-2.311** (0.015)	-2.513*** (0.006)			
Defl. Ind.				0.311 (0.454)	0.0880 (0.828)	-0.156 (0.689)
Defl. Ind. × After 2022				-2.151*** (0.002)	-1.874*** (0.006)	-1.778*** (0.007)
Constant	14.27*** (0.000)	14.28*** (0.000)	14.31*** (0.000)	14.50*** (0.000)	14.48*** (0.000)	14.49*** (0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	87905	87105	86887	88633	87817	87598

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Earnings

- Do individuals associate a deflation with **lower earnings**?

	(1)	(2)	(3)	(4)	(5)	(6)
	Earnings	Earnings	Earnings	Earnings	Earnings	Earnings
After 2022	-15.36 (0.318)	-14.93 (0.323)	-13.22 (0.327)	-12.72 (0.310)	-12.36 (0.314)	-10.54 (0.319)
Defl. Prob.	-24.51 (0.358)	-28.53 (0.352)	-30.19 (0.352)			
Defl. Prob. × After 2022	24.67 (0.355)	26.63 (0.352)	27.70 (0.353)			
Defl. Ind.				-11.40 (0.359)	-13.21 (0.354)	-14.55 (0.352)
Defl. Ind. × After 2022				11.50 (0.355)	13.12 (0.348)	14.11 (0.349)
Constant	19.60 (0.203)	20.06 (0.212)	20.12 (0.213)	16.95 (0.176)	16.99 (0.184)	16.93 (0.183)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	100508	99519	99290	101335	100328	100098

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Stock Prices

- Do individuals associate a deflation with **lower stock prices**?

	(1)	(2)	(3)	(4)	(5)	(6)
	Stocks	Stocks	Stocks	Stocks	Stocks	Stocks
After 2022	-4.023*** (0.000)	-4.072*** (0.000)	-3.960*** (0.000)	-4.093*** (0.000)	-4.225*** (0.000)	-4.106*** (0.000)
Defl. Prob.	-2.856*** (0.000)	0.00509 (0.991)	0.0675 (0.883)			
Defl. Prob. × After 2022	0.345 (0.718)	-0.946 (0.324)	-1.060 (0.271)			
Defl. Ind.				-2.742*** (0.000)	-0.941** (0.016)	-0.894** (0.021)
Defl. Ind. × After 2022				1.382* (0.061)	0.294 (0.681)	0.157 (0.825)
Constant	43.38*** (0.000)	42.96*** (0.000)	42.95*** (0.000)	43.17*** (0.000)	43.02*** (0.000)	43.01*** (0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	148455	146557	146229	150369	148419	148088

Spending

- Is a deflation associated with **lower spending**?

	(1)	(2)	(3)	(4)	(5)	(6)
	Spending	Spending	Spending	Spending	Spending	Spending
After 2022	3.329*** (0.000)	3.460*** (0.000)	3.517*** (0.000)	3.399*** (0.000)	3.516*** (0.000)	3.599*** (0.000)
Prob. Defl.	-0.913** (0.047)	-1.395** (0.032)	-1.556* (0.055)			
Prob. Defl. × After 2022	-0.116 (0.878)	0.0880 (0.914)	0.283 (0.767)			
Prob. Ind.				-0.836*** (0.009)	-1.119*** (0.008)	-1.254** (0.020)
Prob. Ind. × After 2022				-0.145 (0.781)	0.102 (0.855)	0.212 (0.749)
Constant	4.753*** (0.000)	4.711*** (0.000)	4.723*** (0.000)	4.709*** (0.000)	4.624*** (0.000)	4.625*** (0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	149208	147293	146964	151089	149133	148801

Home Price Changes

- Is a deflation associated with **reduced home price changes?**

	(1)	(2)	(3)	(4)	(5)	(6)
	Home 3Y	Home 3Y	Home 3Y	Home 3Y	Home 3Y	Home 3Y
After 2022	0.112 (0.754)	0.118 (0.737)	0.153 (0.662)	0.273 (0.427)	0.293 (0.382)	0.324 (0.330)
Defl. Prob.	-1.041*** (0.000)	-2.109*** (0.000)	-2.202*** (0.000)			
Defl. Prob. × After 2022	-6.006*** (0.000)	-5.546*** (0.000)	-5.531*** (0.000)			
Defl. Ind.				-2.166*** (0.000)	-2.867*** (0.000)	-2.923*** (0.000)
Defl. Ind. × After 2022				-4.664*** (0.000)	-4.224*** (0.000)	-4.200*** (0.000)
Constant	5.559*** (0.000)	5.702*** (0.000)	5.718*** (0.000)	5.652*** (0.000)	5.707*** (0.000)	5.715*** (0.000)
Demographic FE	N	Y	Y	N	Y	Y
State FE	N	N	Y	N	N	Y
Employment FE	N	N	Y	N	N	Y
Observations	130468	128789	128499	131816	130111	129818

(In)Consistency with Economic Theory

- Are individuals' expectations consistent with any of the **leading economic theories** on deflation?

	Unemployment	Income	Spending	Home Prices	Stock Prices
Deflation spiral	Up	Down	Down	Down	Down
Debt deflation	Up	Down	Down	Down	Down
Supply-driven deflation	Down	Up	Neutral/Down	Down	Ambiguous
Reversal of profit-led inflation	Neutral	Neutral	Down	Neutral	Down

Additional Results

- No evidence for confusion with “disinflation”
 - Results hold when considering only individuals who answer a related “numerary question” correctly
 - Results hold when considering only individuals whose reported inflation/deflation indicator is consistent with the reported density
 - Reported deflation probabilities are strongly negatively related with expected gas and food price changes
- Results are supported by similar survey data from Canada
 - Canadian Survey of Consumer Expectations (CSCE) resembles the United States SCE
 - Not as detailed in terms of questions on economic expectations

Conclusion

- Pronounced **deflation tail** developed during the recent high-inflation period
- Allows us to study the economic expectations that individuals associate with a deflation scenario
- Individuals associate a deflation scenario with
 - **Lower unemployment** and higher personal job security
 - Lower spending, neutral effect on income
 - **Lower house prices**, tendentially lower stock prices
- Suggests that respondents do not think along the lines of deflation spiral or debt deflation theories
- Individuals likely think along the lines of **supply-driven deflation** (or reversal of profit-led inflation), potentially neglecting negative effects