

Fearing the Fed: How wall street reads main street

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Motivation

- Response of stock prices to MNAs is time-varying.
 - Common explanation is revisions to policy expectations embedded in the news.
 - Good economic news is good for cash flows, but sometimes bad for discount rates.
 - eg: Wall Street hopes cool economic data will prompt the Fed to halt rate hikes.
- Evidence of common explanation for time-varying stock sensitivity is lacking.
 - The relationship between cash flow and discount rate channels, and their time variation drivers, remain unclear.
- Idea: Exploit the comovement pattern between stock and bond returns around MNAs, formalize the economic mechanism underlying the time variation.

Question

- Q1: How stock sensitivity to MNAs vary with economy's state?
 - Result: Largest early in an expansion and essentially zero late in an expansion.
 - This pattern is consistent after the Covid pandemic.
- Q2: What is the economic drivers of these time variation?
 - Result: Monetary policy expectations
 - Evidence from stock and bond market prove investors revise expectations about future interest rate changes after MNAs.

Contribution

- Contribute to papers on time variation in stock market' s reaction to MNAs.
 - Prior: Stock prices are more volatile in recessions, which draw focus on risk-based explanations(Andersen et al.,2007;McQueen and Roley,1993).
 - Extension: Sensitivity peaks early in expansion and drops to zero late.
- Contribute to the explanation of time-varying stock sensitivity to MNAs.
 - Shows stock sensitivities variation is consistent with varying expectations of monetary policy responses to macro news.
 - Both output gap and inflation likely affect stock sensitivity to MNAs with low-frequency shifts in their relative importance.

Data

- MNAs: MNAs from BLS,CB,BEA,FRB,CB,ETA and ISM & expectations of these MNAs, tabulated by Bloomberg Financial Services
 - Standardization of MNA surprises: $X_{i,t} = \frac{MNA_{i,t} - E_{t-\Delta}(MNA_{i,t})}{\text{Normalization}}$
 - Normalization: Scales MNA surprise by the cross-sectional SD of the individual forecasters' prediction.
- Financial Data:
 - Stock and Bond market returns: ES for stock; ED, FV and TY for bond (from TickData)
 - Measures of business cycle: VIX index from the CBOE and PD ration from Robert Shiller's webpage.
- Macroeconomic Data: St. Louis Fed & Philadelphia Fed(survey forecast).

Q1:Design

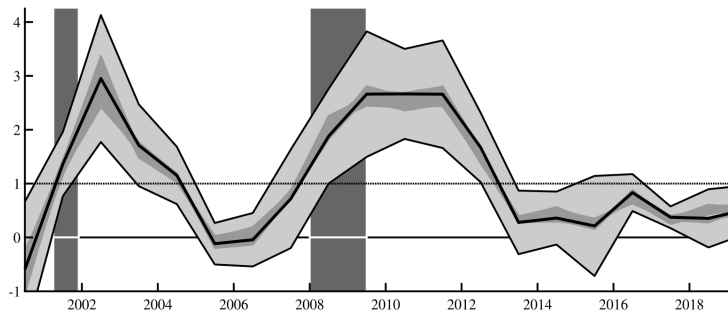
- Estimating the time-varying sensitivity of returns to news
 - Assumption: One factor structure to the time variation in return sensitivities.

$$r_{t-\Delta_l}^{t+\Delta_h} = \alpha^\tau + \beta^\tau \gamma' X_t + \epsilon_t \quad (1)$$

- Vector X_t contains various MNA surprises;
 - γ measures the sample average responses;
 - τ indexes the calendar year;
 - $\Delta = \Delta_l = \Delta_h = 30min$
 - MNAs: CNP,IJC,ISM,CCI
- Advantage: It substantially reduces the small sample problem by including more data in the estimation of β^τ .

Q1:Result

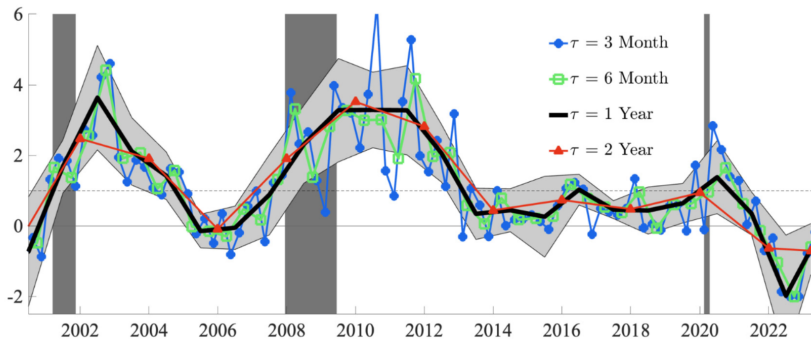
- Time variation in stock sensitivity to macroeconomic news: 1999-2019(β^T).



- Periods of peak stock return sensitivity do not coincide with periods of economic recession.

Q1: Result

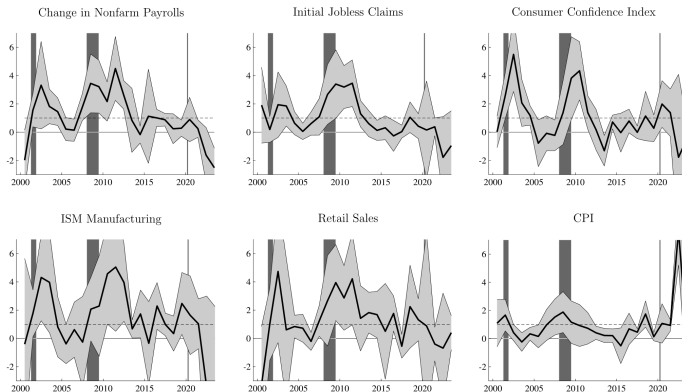
- Time variation in stock sensitivity to macroeconomic news: 1999-2023(β^τ).



- Stock sensitivity to macroeconomic news increased post-Covid.
- Different: Coefficient becomes significantly negative.

Q1:Result

- The recovery from the Covid-19 pandemic exhibited a significant spike in inflation.



- Stock responses to inflation becoming approximately 7-8 times greater in 2022-2023

Q2:Design

- Whether the time variation in stock return sensitivity, β^τ , can be explained by key economic observables $Z_{\tau-1}$?

$$r_{t-\Delta}^{t+\Delta} = \alpha^\tau + \beta^\tau \gamma' X_t + \epsilon_t, \beta^\tau = \beta_0 + \beta_1' Z_{\tau-1} \quad (2)$$

- r : ES contract in stock market, EuroDollar futures Treasury futures in bond market;
- $Z_{\tau-1}$: economic observables to explain time variation in stock return sensitivity;
 - Measures of the business cycle: the demeaned output gap, inflation...
- τ : index a quarter to include more data;
- Δ : equals 30min;

Q2:Result

- Estimation results for stock sensitivity $\hat{\beta}_0$ and $\hat{\beta}_1$ based on sample from 1999 to 2019.

	β_0	Output gap	Δ T-bill	T-bill	Inflation	Term premia	PD ratio	Recession prob.	VIX	R^2
(1)	0.96*** (0.10)	-0.35*** (0.06)								0.13
(2)	0.93*** (0.11)		-2.72*** (0.66)							0.12
(3)	0.96*** (0.10)			-0.31*** (0.06)						0.11
(4)	0.88*** (0.11)				-0.30** (0.12)					0.10
(6)	0.82*** (0.10)					0.62*** (0.10)				0.12
(7)	0.92*** (0.11)						-2.15*** (0.61)			0.11
(8)	0.99*** (0.10)							0.03*** (0.01)		0.12
(9)	0.97*** (0.11)								0.06*** (0.02)	0.11
(10)	0.94*** (0.10)	-0.33*** (0.06)	-2.21*** (0.64)							0.14
(11)	0.95*** (0.10)	-0.34*** (0.06)	-2.27*** (0.65)		0.05 (0.12)					0.14
(12)	0.95*** (0.10)	-0.32** (0.14)	-2.29*** (0.71)	-0.01 (0.13)	0.05 (0.12)					0.14
(13)	0.83*** (0.09)	-0.27*** (0.06)	-2.16*** (0.61)		0.01 (0.12)	0.47*** (0.09)				0.16
(14)	0.94*** (0.10)	-0.29*** (0.08)	-2.42*** (0.74)		0.05 (0.12)		-0.59 (0.79)			0.14
(15)	0.85*** (0.10)	-0.25*** (0.06)	-2.13*** (0.69)		0.03 (0.12)	0.45*** (0.11)		0.01 (0.01)	-0.01 (0.02)	0.16

- Sensitivity peaks when output gap is large and negative, and i aren't expected to increase.

Q2:Result

- Estimation results for stock sensitivity $\hat{\beta}_0$ and $\hat{\beta}_1$ based on sample from 1999-2022.

		Output gap	ΔT-bill	Inflation	Term premium		Value
Specification: $\beta^\tau = \beta_0 + \beta_1' Z_{t-1}$							
(1)	β_1	-0.25*** (0.05)	-2.44*** (0.56)	-0.05 (0.06)	0.45*** (0.08)	β_0	0.82*** (0.09)
						R^2	0.14
(2)	β_1	-0.26*** (0.05)	-2.60*** (0.54)		0.46*** (0.08)	β_0	0.82*** (0.09)
						R^2	0.14
Specification: $\beta^\tau = \beta_0 + \beta_1' \mathbb{I}_{t < 2020} Z_{t-1} + \beta_2' \mathbb{I}_{t \geq 2020} Z_{t-1}$							
(3)	β_1	-0.27*** (0.06)	-2.15*** (0.61)	0.01 (0.12)	0.47*** (0.09)	β_0	0.83*** (0.09)
	β_2	-0.07 (0.10)	-3.43*** (1.33)	-0.17 (0.12)	0.15 (0.26)	R^2	0.14
(4)	β_1	-0.27*** (0.06)	-2.15*** (0.59)		0.47*** (0.09)	β_0	0.82*** (0.08)
	β_2		-3.16*** (1.13)	-0.24*** (0.06)		R^2	0.14
(5)	β_1	-0.27*** (0.06)	-2.17*** (0.60)		0.48*** (0.09)	β_0	0.78*** (0.08)
	β_2		-5.54*** (1.06)			R^2	0.14

- Driver of stock sensitivity shift from the output gap to inflation.
- Fed's response expectations significantly affect stock reactions to macro news.

Q2:Result

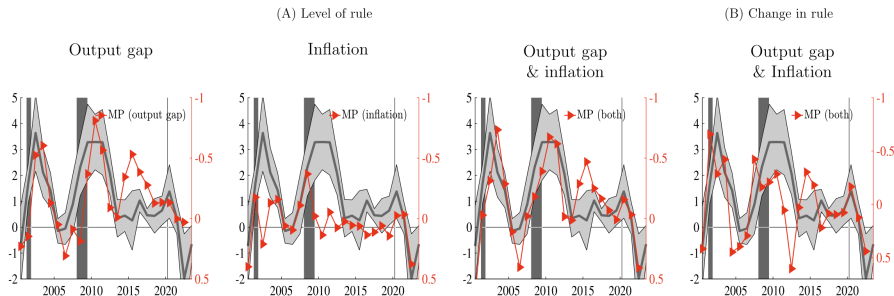
- Estimation on bond market, change r from ES to ED,FV and TY.

	Constant	Output gap	Δ T-bill	Term premium	R^2
Stock	0.82*** (0.09)	-0.26*** (0.05)	-2.60*** (0.54)	0.46*** (0.08)	0.14
EuroDollar 3m	-0.05*** (0.01)	-0.01*** (0.00)	0.06 (0.05)	-0.02*** (0.00)	0.14
EuroDollar 12m	-0.14*** (0.01)	-0.02*** (0.01)	-0.09 (0.08)	-0.07*** (0.01)	0.24
Treasury 5y	-0.61*** (0.04)	-0.03* (0.02)	-0.30 (0.26)	-0.25*** (0.04)	0.25
Treasury 10y	-0.86*** (0.05)	-0.02 (0.02)	-0.49 (0.34)	-0.32*** (0.05)	0.24

- Good news are bad news for bonds, which is true even more so when economy is above trend.

Q2:Result

- Stock return sensitivity and perceived interest rate rule(Bauer et al.,2022).



- Stock return responses are driven by changes in the perceived monetary policy rule that gives rise to interest rate expectations.

Conclusion

- There is countercyclical sensitivity of the stock market to MNAs.
 - The most notable cyclical variation takes place within expansions: largest early in an expansion and essentially zero late in an expansion.
- Monetary policy expectations is a key driver of time-varying stock sensitivities.
 - When the cash flow news component of stock responses is least offset by discount rate news, leading to high sensitivity.

New ideas

- In Chinese market
- How this patter would affect firm managers action?
- More quantitative approach to model this time-varying stock sensitivity
- ...