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GREEN TRANSMISSION: MONETARY POLICY IN THE AGE OF ESG

EUROPEAN CENTRAL BANK

EUROSYSTEM

Green Transmission: Monetary Policy in the Age of ESG

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Motivation

- Env. objectives are increasingly becoming a key priority for business leaders and boards of directors.
- As of 2020, $35trn of institutional assets track firms' environmental, social and governance (ESG) ratings.
- Speech by Isabel Schnabel (2023): In light of the current monetary policy tightening green investments were relatively shielded from the impact of higher borrowing costs.

Research Questions:

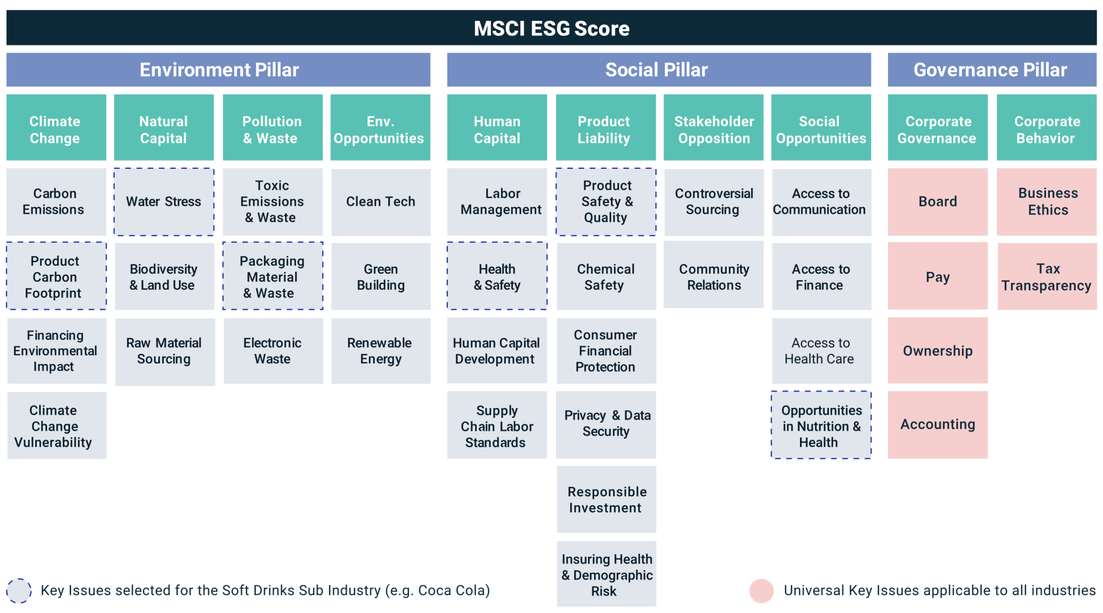
- Are *green firms* more (or less) responsive to monetary policy shocks?
- If so, what explains their sensitivity (or lack thereof) to monetary policy shocks?

This Paper:

1. **combines** firm-level (financial) data, with ESG indicators and monetary policy shocks
2. **exploits** the high-frequency nature of market-based data
3. **provides** evidence of heterogeneous responses to monetary policy based on firm-level greenness
4. **considers** a stylized theoretical model to explain the transmission mechanism

What constitutes a 'green' firm?

- The 'E' in ESG measures a company's resilience to long-term environmental risks
- 'E' is a weighted av. score across 13 environmental issues



Data

- **Environmental Scores:** MSCI ESG IVA Ratings
- **Monetary Policy Surprises:** Bu, Rogers & Wu (2021)
- **Firm-level Data:** Compustat, CRSP, I/B/E/S, IHS Markit

- The final dataset:
- Covers 102 FOMC announcements
- Spans the 2008 - 2020 period
- Has information on 1,361 US publicly listed firms

Empirical Specification

$$\Delta p_{i,t} = \alpha_i + \alpha_t + \beta(\varepsilon_t^m \times g_{i,t-1}) + \delta g_{i,t-1} + \Gamma' Z_{i,t-1} + e_{i,t}$$

- $\Delta p_{i,t}$ is the difference in (log) stock price of firm i at date $t+1$ relative to date $t-1$
- ε_t^m is the BRW monetary policy surprise at FOMC date t
- $g_{i,t-1}$ is the environmental performance score of firm i in year $t-1$
- $Z_{i,t}$ is a vector of firm-level controls

Stock Price Semi-Elasticities

	(1) $\Delta p_{i,t}$	(2) $\Delta p_{i,t}$	(3) $\Delta p_{i,t}$	(4) $\Delta p_{i,t}$
MP shock (ε_t^m)	-16.04***	-14.66***		
	(3.950)	(3.878)		
MP shock × Env. score ($\varepsilon_t^m \times g_{i,t-1}$)		2.411***	2.587***	2.209***
		(0.604)	(0.550)	(0.506)
Env. score ($g_{i,t-1}$)		0.0217	0.0199	0.0471
		(0.0506)	(0.0380)	(0.0320)
Firm FE	Yes	Yes	Yes	Yes
Time FE	No	No	Yes	Yes
Industry_time FE	No	No	No	Yes
Controls	Yes	Yes	Yes	Yes
R-squared	0.0775	0.0790	0.314	0.359
Observations	38037	38037	38037	37928

Notes: The numbers in parenthesis are standard errors, which are clustered at the event-level. The asterisks denote statistical significance (*** for p < 0.01, ** for p < 0.05, * for p < 0.1).

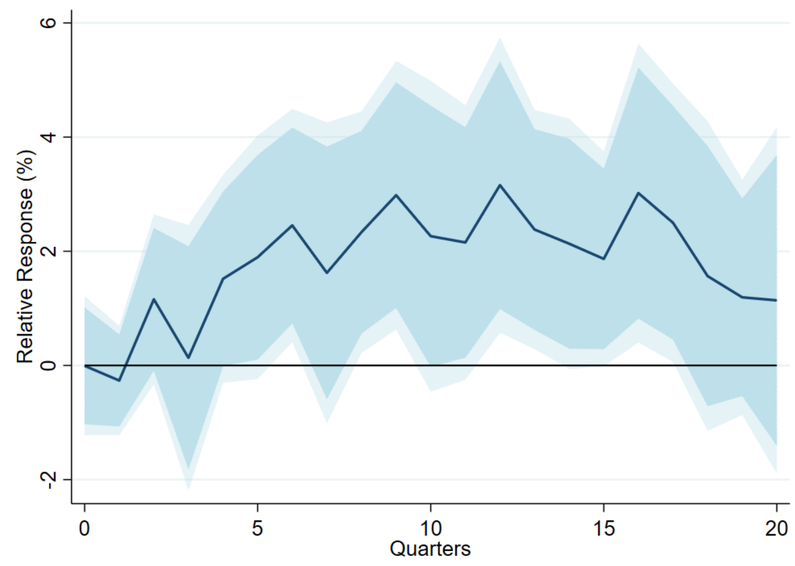
Interpretation: Following a 1pp surprise in monetary policy, stock prices of green firms (quintile 5 firms) fall by around 10%, whereas the stock prices of their brown counterparts (quintile 1 firms) fall by around 21%.

Robustness: These results are robust to (i) alternative monetary policy shock measures, (ii) alternative environmental performance scores, (iii) sample-splitting, (iv) longer horizons, (v) quintile classification, and (vi) in line with evidence from CDS spreads.

Relative Response of Green Firms' Investment to MP shocks

- In spirit of Ottonello & Winberry (2020) and given potential dynamic effects:

$$\Delta_h log k_{i,t} = \alpha_i^h + \alpha_{s,t}^h + \beta^h(\varepsilon_t^m \times g_{i,t-1}) + \delta^h g_{i,t-1} + \Gamma'^h Z_{i,t-1} + e_{i,t,h}$$



Notes: In line with local projection methods, each horizon is estimated separately. The dependent variable is $\Delta log k_{i,t+h}$, over the horizons considered. The independent variable is $\varepsilon_t^m \times g_{i,t-1}$. The light blue shaded areas denote the 95% and 90% confidence intervals around point estimates constructed with standard errors clustered at the time level.

Differences in Financial Characteristics

	Green	Brown	Difference
Env. performance	-0.291	-4.089	3.798***
Size	8.074	8.170	-0.096***
Leverage	0.454	0.485	-0.031*
Short term finance	0.029	0.030	-0.001
Long debt share	0.871	0.888	-0.017***
Profitability	0.028	0.027	0.002**
Retained earnings to assets	-0.028	0.055	-0.083***
Dividends per share	0.134	0.227	-0.093***
Liquidity	0.171	0.073	0.098***
Market to book ratio	2.175	1.316	0.859***
Age (since CRSP incorp)	25.262	33.397	-8.135***
D2default	9.067	7.161	1.905***
Transparency	49.251	28.766	20.486***
Observations	11,388	11,368	

- Double sorting firms based on their environmental performance and financial characteristics does not explain the dampened sensitivity of green firms to monetary policy

Preferences for Sustainable Investing in a Stylized Theoretical Framework

- When investors derive a non-pecuniary benefit from holding 'green' assets, the semi-elasticity of green asset prices to monetary policy can be decomposed into:

$$\frac{dln(q_{B,1}^*)}{dr} = \underbrace{-\frac{1}{1+r}}_{\text{Pecuniary Effect}}, \frac{dln(q_{G,1}^*)}{dr} = -\frac{1}{1+r} \underbrace{+\frac{\frac{\alpha}{1+\alpha}y}{\frac{\pi_G}{1+r} + \frac{\alpha}{1+\alpha}y}\frac{1}{1+r}}_{\text{Green Preferences Effect}}$$

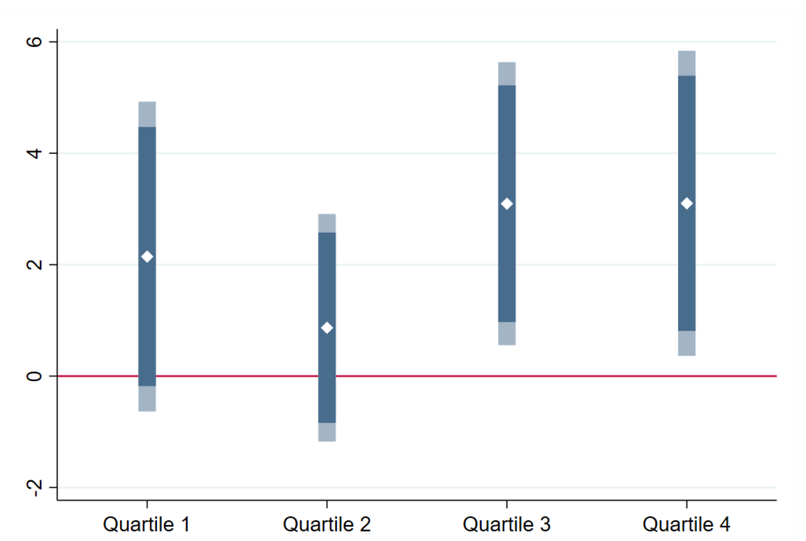
- **Testable Prediction:** The differential response of green asset prices (compared to brown) with respect to monetary policy gets amplified in states of the world with stronger preferences for sustainable investing, given $\alpha > 0$.

Evidence from index funds with ESG Mandates

- Augment baseline specification with a triple interaction term:

$$\Delta p_{i,t} = \alpha_i + \alpha_t + \beta(\varepsilon_t^m \times g_{i,t-1}) + \delta g_{i,t-1} + \gamma(\varepsilon_t^m \times g_{i,t-1} \times s_{i,t}) + \Gamma' Z_{i,t-1} + e_{i,t}$$

- $s_{i,t}$ is the percentage of firm i that is held by index funds with ESG mandates



Notes: This graph plots the beta coefficients (before the interaction of monetary policy with firm-level greenness) for the four different quartiles of the Investor-based ESG mandate distribution. Quartile 1 (Quartile 4) refers to securities that are held by a small (large) proportion of index funds with ESG mandates as of a quarter before the monetary policy shock. Confidence intervals are reported at the 90% and 95% level.

Conclusions

- Preferences for sustainable investing play an essential role in the transmission of shocks in financial markets.
- All else equal, monetary policy may be less powerful when the share of greener firms increases, or when preferences for sustainable investing gain traction.