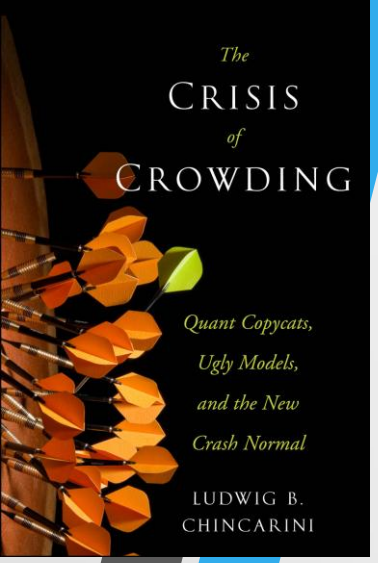
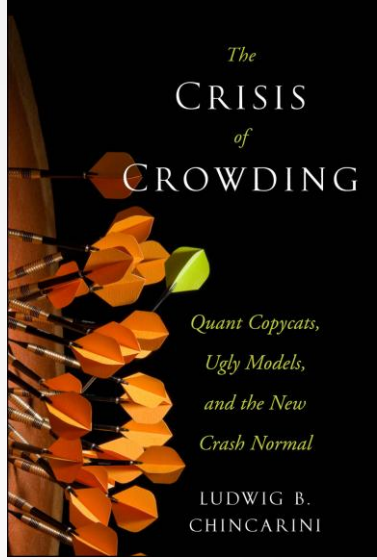


DISCUSSANT PRESENTATION
Characteristics-Driven Carbon Beta: What Do Investors Really Price?



Authors: Stefano Grillini and Tristan Jourde

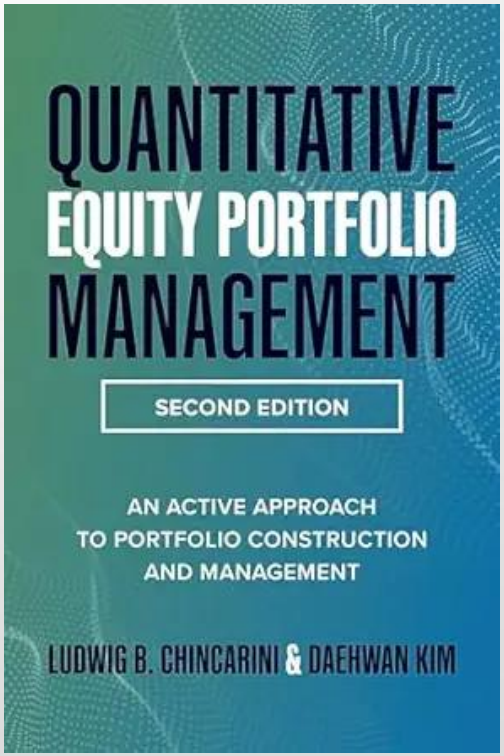
June 26, 2026

Discussant: Ludwig B. Chincarini, Ph.D., CFA
University of San Francisco

EFMA ANNUAL CONFERENCE
JUNE 26, 2026

Thank you for coming.

New Edition of QEPM is available!



Good for teaching students in quant finance.

1. Summary of Research

The Core Question: Do stock markets penalize polluting firms and reward clean ones? (p. 2)
The Traditional Blindspot: Previous studies looking only at raw emissions data found mixed or weak results (pp. 1-2).
The Paper's Solution: Investors don't just look at a company's past carbon footprint; they track a moving target of news, laws, and public reputation (pp. 1, 4).
The Big Discovery: By bundling these shifting pieces into a single dynamic "Carbon Beta," the authors expose a hidden (4.8\%) annual return premium paid to investors holding transition-vulnerable stocks (pp. 1, 36).

1. Summary of Research

EMPIRICAL FRAMEWORK (SIMPLIFIED)
Step 1: Construct Brown-minus-Green Climate Factor
Step 2: Remove traditional risk exposures
(Market, Size, Value, Profitability, Investment, Momentum)
Step 3: Estimate Carbon Beta as a function of observable characteristics
Step 4: Test whether this enhanced carbon beta is priced

- The innovation is replacing a noisy estimated carbon beta with a characteristics-driven carbon beta that is linked to observable firm attributes and climate-related information.

1. Summary of Research

$$CI_{i,t} = \frac{\text{Emissions}_{i,t}^{(\text{Scope 1 + Scope 2})}}{\text{Total Sales}_{i,t}}$$

$$F_t^{\text{Climate}} = \frac{1}{2}(SB_t + BB_t) - \frac{1}{2}(SG_t + BG_t)$$

$$\varepsilon_{i,t} = \alpha_i + \delta_t + \beta_{i,t}^{\text{Climate}} F_t^{\text{Climate}} + \epsilon_{i,t}$$

$$\beta_{i,t}^{\text{Climate}} = \gamma_0 + \sum_{k=1}^{K} \gamma_k Z_{i,t-1,k}$$

$$\varepsilon_{i,t} = \alpha_i + \delta_t + \gamma_0 F_t^{\text{Climate}} + \sum_{k=1}^{K} \gamma_k (F_t^{\text{Climate}} \times Z_{i,t-1,k}) + \epsilon_{i,t}.$$

2. General Comments

Methodological Process

- You run many regressions and find various items that are significant, but then they are removed. Does this create problems in interpretation?
- Do we need to worry about the sequential steps. That is, estimations are created with error, but then we use them in further regressions?
- Is the DCC-GARCH overkill or necessary? Would results survive with simpler estimation?
- Is multicollinearity a problem in Table 2? That is, these measures may be related and significance difficult to interpret?
- Are the results preference pricing or risk pricing? How can you distinguish?

2. General Comments

Empirical Robustness Checks
Portfolio Triple-Sort Matrices:

Could you divide by CI into 3rds, then divide according to a particular Z(1), then divide by a further Z(2). Maybe show a 3D graph of expected versus actual for different methods (statistical beta and fundamental beta)?

2. General Comments

Maintain Audience Focus:

Critique: The paper delivers a massive volume of secondary tests (macro conditions, physical risks, financial distress) that muddy the waters (pp. 20, 27, 30).

Suggestion: Continually anchor the text back to the primary mission: proving that investors price a sophisticated, multi-layered information set rather than static carbon footprints (pp. 1, 4).

The 24-Month Carbon Intensity Lag:

Question: Why use a rigid 24-month lag for emissions reporting (p. 7)? While data publication delays exist, a 2-year window seems excessively long for highly liquid equity markets.

Suggestion: Show a robustness check comparing results at 12-month or 18-month reporting lags to confirm the asset pricing signal remains stable.

2. General Comments

Exploiting Political & Structural Shocks:

Suggestion: The paper notes a long-term erosion in the premium (p. 8). To prove this is sentiment-driven, explicitly test major anti-ESG political milestones (e.g., Donald Trump's 2016 election victory) via targeted event-study windows to map immediate capital reallocations (pp. 6, 8).

2. General Comments

The Table 3 Coefficient Problem ((0.001)): Is it Economically Meaningful? (p. 21)

The Question: Table 3 lists a coefficient of (0.001) for the triple interaction term (*Climate Factor* × *Carbon Pricing* × *Log CI*) (p. 21). Is this value too microscopic to matter in the real world?

2. General Comments

It would be nice for you to put some of your estimates into everyday language. For example, $\Delta\beta^{\text{Climate}} = 0.001 \times \$50 \times 10.0 = 0.50$

Suppose the baseline regional Carbon Pricing Index jumps by **$50** per ton due to strict new legislation (p. 15).
The Math: We track a heavy-emitting utility firm with a high log carbon intensity score of **10.0** (p. 15).
The Shift in Carbon Beta:
\(\Delta \beta ^{\text{Climate}}=0.001\times \$50\times 10.0=0.50\)
The Impact on Expected Returns:

A Carbon Beta increase of **0.50** means the stock's sensitivity to systemic climate shocks has spiked significantly (pp. 11, 34).
Given the paper's annualized premium of **\(4.8\%\)**, this structural shift translates to an expected return premium change of:
\(0.50\times 4.8\%=**2.4\%**\text{\ per\ year}\)

If this is close to reality: The coefficient looks tiny because it interacts with unstandardized carbon prices (p. 15). When scaled to real-world policy shifts, it is highly significant economically. The paper should explicitly include this type of narrative example to stop the audience from misinterpreting the small decimal value (p. 21).
If not, you should also state this.

3. Specific Comments

- Since you use so many interactive terms for the fundamental beta, maybe try to sort through them.
- Or perhaps, create a weighted average for every category and run a regression with that showing an overall dissection.
- So many results, so try to focus on main contribution and leave all other results to a robustness section.

Summary

- Interesting paper, conclusion reminds us that the goal is to "…deliver a robust and economically interpretable measure of carbon beta."
- Focus on this more throughout.
- What's the right model? You present many. If we are to use it, we need "the model". Have you thought about what is that?

Thank you

- Dr. Ludwig Chincarini, CFA — www.ludwigbc.com
- University of San Francisco — chincarinil@hotmail.com