Global Currency Risk and Corporate Carbon Emissions

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The Firm, FX, and the Environment

- One of the most pressing issues of our time: the environment.
- Key actor: firms.
- Reality: firms have increasingly international footprint, from upstream suppliers to downstream customers.
- Natural and important: how does a firm's FX risk exposure affect its carbon emissions?

This paper

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- Key relationship studied: $Emissions_{f,t} = \alpha + \beta FXvol_{f,t} + \varepsilon_{f,t}$.
  - Firm-specific FX risk exposure: $FXvol_{f,t} = \sqrt{\mathbf{w_{f,t}} \cdot \Sigma_{i,t} \cdot \mathbf{w'_{f,t}}}$.
  - $\Sigma_{i,t}$ reflects variance and covariance of FX returns in all currencies.
  - $\mathbf{w_{f,t}} = (w_{f,i,1}, w_{f,i,2}...w_{f,i,n})^{\top}$: firm's revenue exposure across currencies.

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- Central identification challenge: "[A]s both foreign revenue and carbon intensity are outcomes of endogenous decisions made by firms, there could exist omitted variables that influence both outcomes."
- Solution: two thoughtful instruments.
- Discussion: thoughts on further strengthening the causal link between FX risk exposure and firm's emission decisions.

IV and the identification challenge

- Instruments:
  1. Exchange rate regime transitions (fixed $\leftrightarrow$ floating):
     $\Sigma_{j,j\neq i} w_{f,i,jt} \cdot \mathbf{1}_{\text{fixed},i,j,t-1} \cdot \mathbf{1}_{\text{floating},i,j,t}$.
  2. Expansion of FX derivative markets (CME product inclusion):
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- Food for thought: can one instrument for $FXvol_{f,t}$ without using $w_{f,i,jt}$?

Another way to allay endogeneity concern

- Articulate the mechanism behind why firm's emissions would react to FX risk.
- Proposed mechanism 1: lower FX risk reduces need for operational hedging.
  - Operational hedging in Hoberg and Moon (2017): firms coordinate the currency of input purchase and sales revenue to offset FX exposure.
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  - If so, should generate testable time-series implications.
- Proposed mechanism 2: higher FX risk increases financial distress.
  - Emission abatement is costly, financially distressed firms therefore do less.
  - This implies that abatement must also bring *benefits*, otherwise why don't all firms forego abatement?
  - What are these benefits? Are magnitudes less than FX risk-induced distress?

Conclusion

- Important topic and careful execution.
- Message that FX risk exposure drives firm's emissions decision is sensible.
- Message can potentially be strengthened:
  - Clarifying how the instruments solve the endogeneity problem.
  - Articulating the economic mechanism that links FX to emissions.
- Looking forward to the next version!

Hoberg, G., and S. K. Moon. 2017. Offshore activities and financial vs operational hedging. Journal of Financial Economics 125:217–44.