Does environmental policy uncertainty deter clean-tech (F)DI inflows to the US?

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Sustainable Economy
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Motivation

Massive investment efforts and technological advances necessary to facilitate transition to a low-carbon economy.

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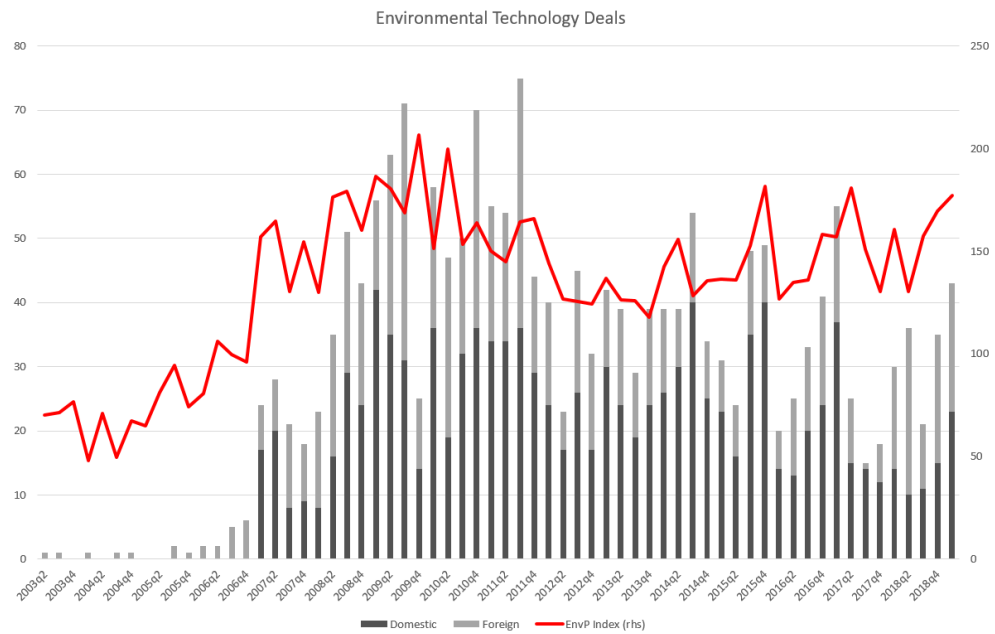
$\Longrightarrow$ **This paper**: How policy-sensitive are these?

- Correlation between # greenfield investment deals in 'environmental technology' (ET) and environmental policy (EnvP) in the US.
  - Domestic: 0.71
  - Foreign: 0.66



▸ Same for intensive margin (capex)

Motivation cont'd

Strong EnvP-(F)DI nexus $\Longrightarrow$ likely important role of EnvP uncertainty because

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- of strong policy reliance for competitiveness of ETs.
- EnvP especially riddled with uncertainties due to polarizing nature.
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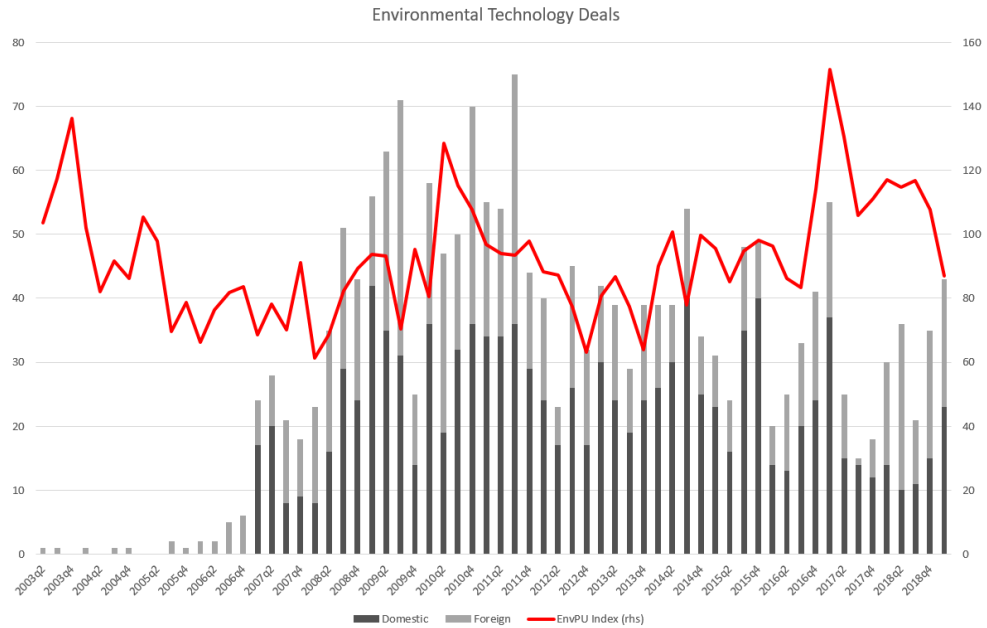

What we do

Testable Hypotheses:

1. **Clean-tech greenfield investment stalls amid elevated levels of environmental policy uncertainty.**

   Channel: real options $\Longrightarrow$ firms prefer to 'wait-and-see' and/or lower capex until uncertainty resolved.

2. **Foreign firms react more (less) strongly to US EnvP uncertainty.**

   Channel a: information asymmetry $\Longrightarrow$ foreign firms less sure how to navigate US policy landscape.

   Channel b: productivity $\Longrightarrow$ foreign firms better able to absorb the cost of US EnvPU as they are multinationals who tend to be larger and more productive.

Outline

Literature

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- **Porter Hypothesis** (PH): EnvP can stimulate innovation so polluting firms gain competitiveness (Porter and van der Linde, 1995).

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  - **Size of effect is small compared to other factors** (Dechezleprêtre and Sato, 2017)
    - Proximity to demand/transport costs
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$\Longrightarrow$ **PHH-consistent effects concentrated in polluting + footlose sectors.**

Literature - Policy Uncertainty and FDI

- US FDI inflows drop one quarter after an increase in Partisan conflict about US trade policy (Azzimonti, 2019).
- US FDI outflows drop during pre-election times (Julio and Yook, 2016).
- FDI outflows from source country drop two quarters after a shock in destination country's EPU (Hsieh et al., 2019).

Data

Data

(F)DI: quarter of deals at firm level (source: fDi Markets[1])

- **Sample period**: 2003Q1 - 2019Q1 (64 quarters).
- **Number of firms**: 23,374 firms (46% foreign).
- **Number of projects**: 34,833 projects (40% foreign).
- **Number of environmental technology (ET) projects**: 1,619 (43% foreign), meaning that 5% of all projects in the dataset are in the ET cluster.

Note: Firms are in the dataset if some greenfield project was recorded within the sample period with most firms only appearing once.

[1] Proprietary database by the Financial Times, which tracks global greenfield investments sourced from publicly available sources in 25 languages by cluster, activity and sector.

Data cont'd

1. ET deals are more capital intensive and tend to create fewer jobs, regardless of the source country.

	Overall			Domestic			Foreign		
	Env Tech	Non Env Tech	Difference	Env Tech	Non Env Tech	Difference	Env Tech	Non Env Tech	Difference
Capital investment (mln USD)	99.782	33.693		98.365	32.137		101.837	36.538	
	169.095	199.370		181.047	172.065		150.170	241.402	
			66.089***			66.228***			65.299***
			(16.667)			(12.154)			(11.449)
Jobs created (#)	64.338	79.859		62.286	77.645		67.314	83.906	
	111.415	217.563		124.316	230.346		89.455	191.954	
			-15.521***			-15.359***			-16.593***
			(-5.645)			(-3.904)			(-4.664)
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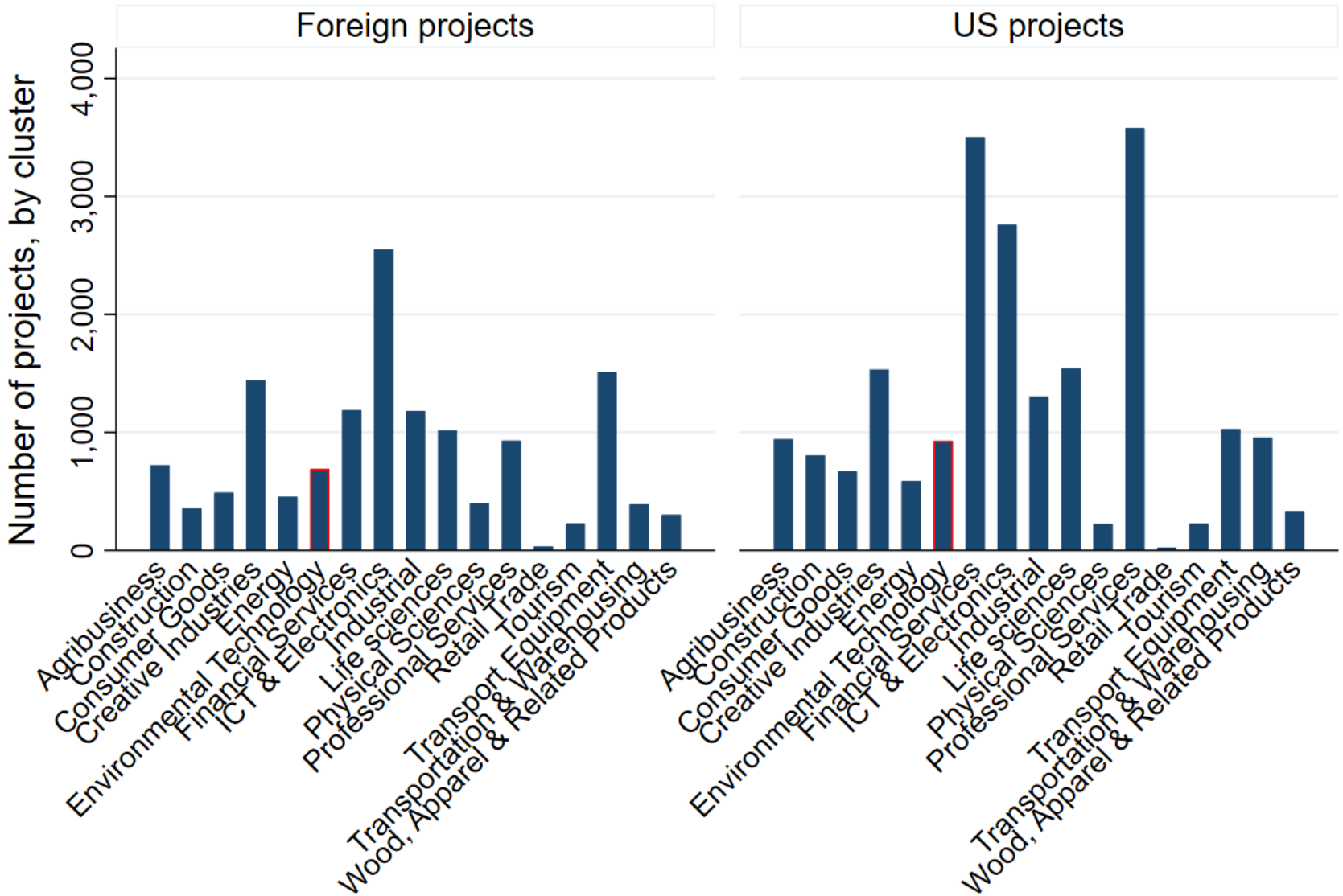
2. The ET cluster is not much correlated with other clusters.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Agribusiness	1.00	0.35	0.40	0.38	0.04	0.13	0.54	0.40	0.32	0.40	0.17	0.54	0.06	-0.12	0.45	0.34	0.35
2 Construction	0.35	1.00	0.43	0.37	0.03	0.05	0.56	0.34	0.28	0.46	0.23	0.44	0.03	-0.09	0.45	0.23	0.20
3 Consumer Goods	0.40	0.43	1.00	0.31	-0.08	0.31	0.53	0.40	0.16	0.48	0.17	0.56	0.02	0.08	0.29	0.39	0.23
4 Creative Industries	0.38	0.37	0.31	1.00	0.02	0.26	0.65	0.38	0.24	0.44	0.19	0.73	0.03	-0.16	0.41	0.35	0.24
5 Energy	0.04	0.03	-0.08	0.02	1.00	0.53	0.26	0.32	0.12	0.06	-0.09	0.06	0.08	0.44	0.28	0.24	-0.03
6 Environmental Technology	**0.13**	**0.05**	**0.31**	**0.26**	**0.53**	**1.00**	**0.46**	**0.48**	**0.05**	**0.15**	**-0.01**	**0.45**	**-0.33**	**0.39**	**0.10**	**0.29**	**-0.09**
7 Financial Services	0.54	0.56	0.53	0.65	0.26	0.46	1.00	0.58	0.34	0.51	0.22	0.81	0.25	-0.01	0.53	0.47	0.35
8 ICT & Electronics	0.40	0.34	0.40	0.38	0.32	0.48	0.58	1.00	0.23	0.35	0.15	0.57	0.29	0.42	0.46	0.58	0.35
9 Industrial	0.32	0.28	0.16	0.24	0.12	0.05	0.34	0.23	1.00	0.53	-0.01	0.36	0.13	-0.02	0.35	0.23	0.18
10 Life sciences	0.40	0.46	0.48	0.44	0.06	0.15	0.51	0.35	0.53	1.00	0.21	0.63	0.16	0.05	0.45	0.48	0.27
11 Physical Sciences	0.17	0.23	0.17	0.19	-0.09	-0.01	0.22	0.15	-0.01	0.21	1.00	0.17	0.19	-0.06	0.22	0.23	0.14
12 Professional Services	0.54	0.44	0.56	0.73	0.06	0.45	0.81	0.57	0.36	0.63	0.17	1.00	0.15	0.03	0.44	0.64	0.36
13 Retail Trade	0.06	0.03	0.02	0.03	0.08	-0.33	0.25	0.29	0.13	0.16	0.19	0.15	1.00	0.05	0.07	0.50	0.60
14 Tourism	-0.12	-0.09	0.08	-0.16	0.44	0.39	-0.01	0.42	-0.02	0.05	-0.06	0.03	0.05	1.00	0.01	0.12	0.01
15 Transport Equipment	0.45	0.45	0.29	0.41	0.28	0.10	0.53	0.46	0.35	0.45	0.22	0.44	0.07	0.01	1.00	0.40	0.33
16 Transportation & Warehousing	0.34	0.23	0.39	0.35	0.24	0.29	0.47	0.58	0.23	0.48	0.23	0.64	0.50	0.12	0.40	1.00	0.44
17 Wood, Apparel & Related Products	0.35	0.20	0.23	0.24	-0.03	-0.09	0.35	0.35	0.18	0.27	0.14	0.36	0.60	0.01	0.33	0.44	1.00

▸ Cluster definitions

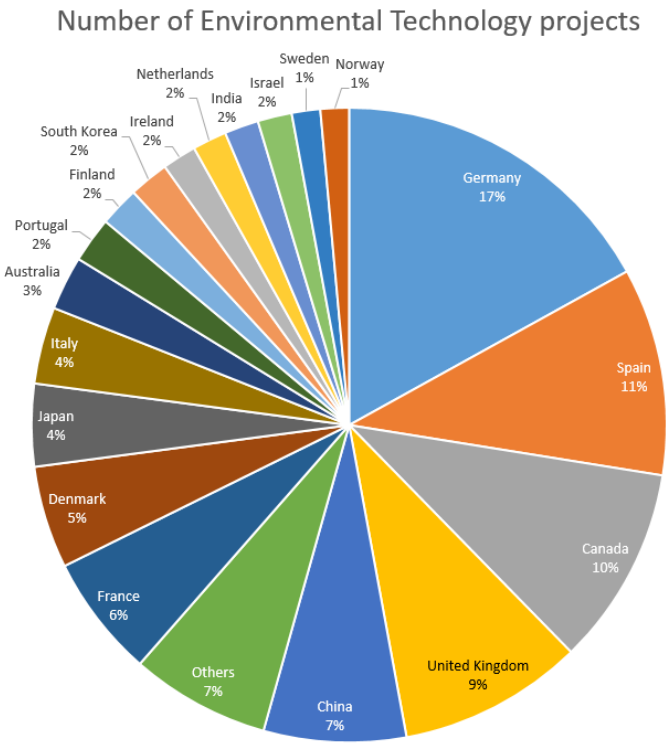
Data cont'd

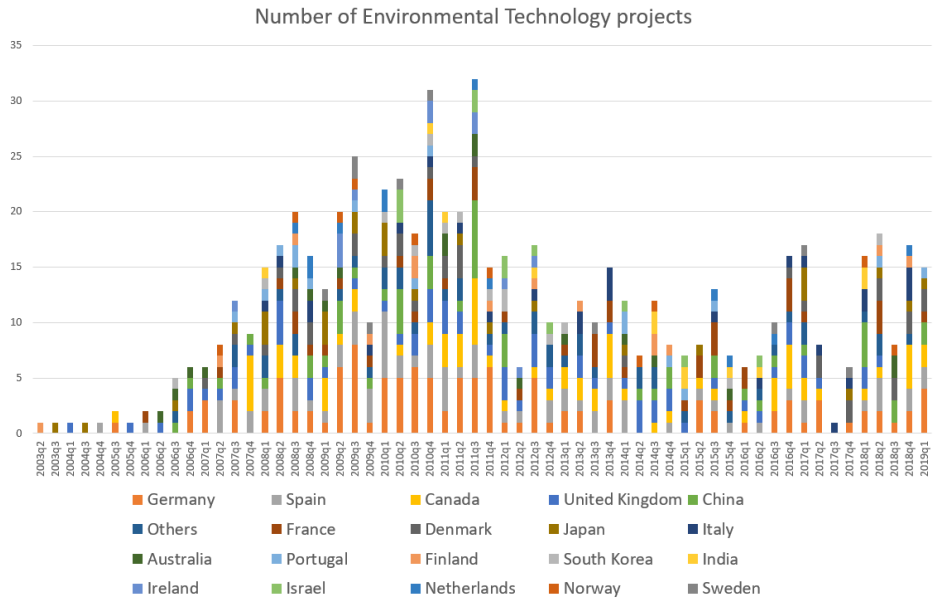
3. The ET cluster represents small share of all projects in the US.



Data cont'd

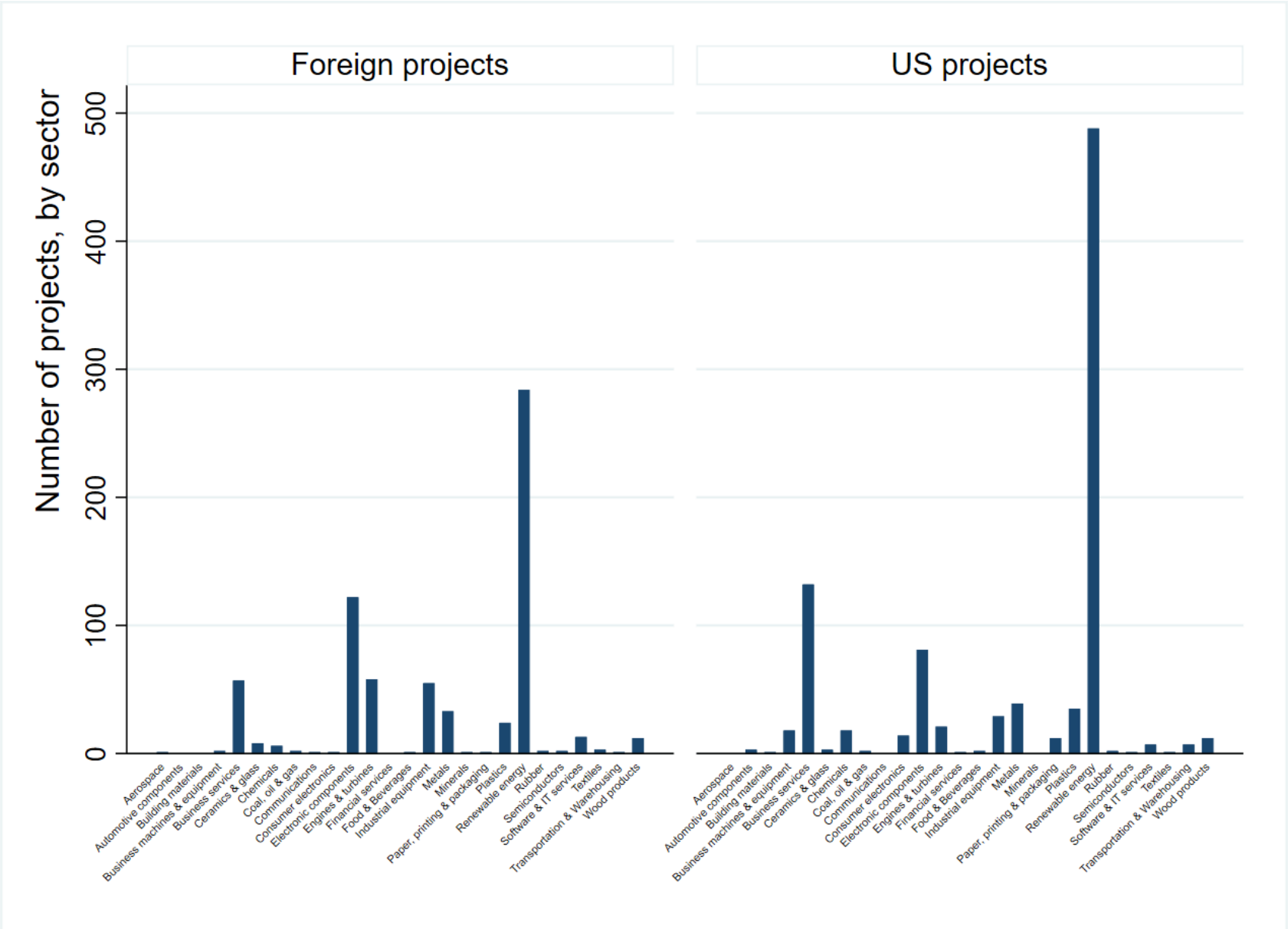
4. ET deals are quite diversified across source countries with no visible market dominance over time.





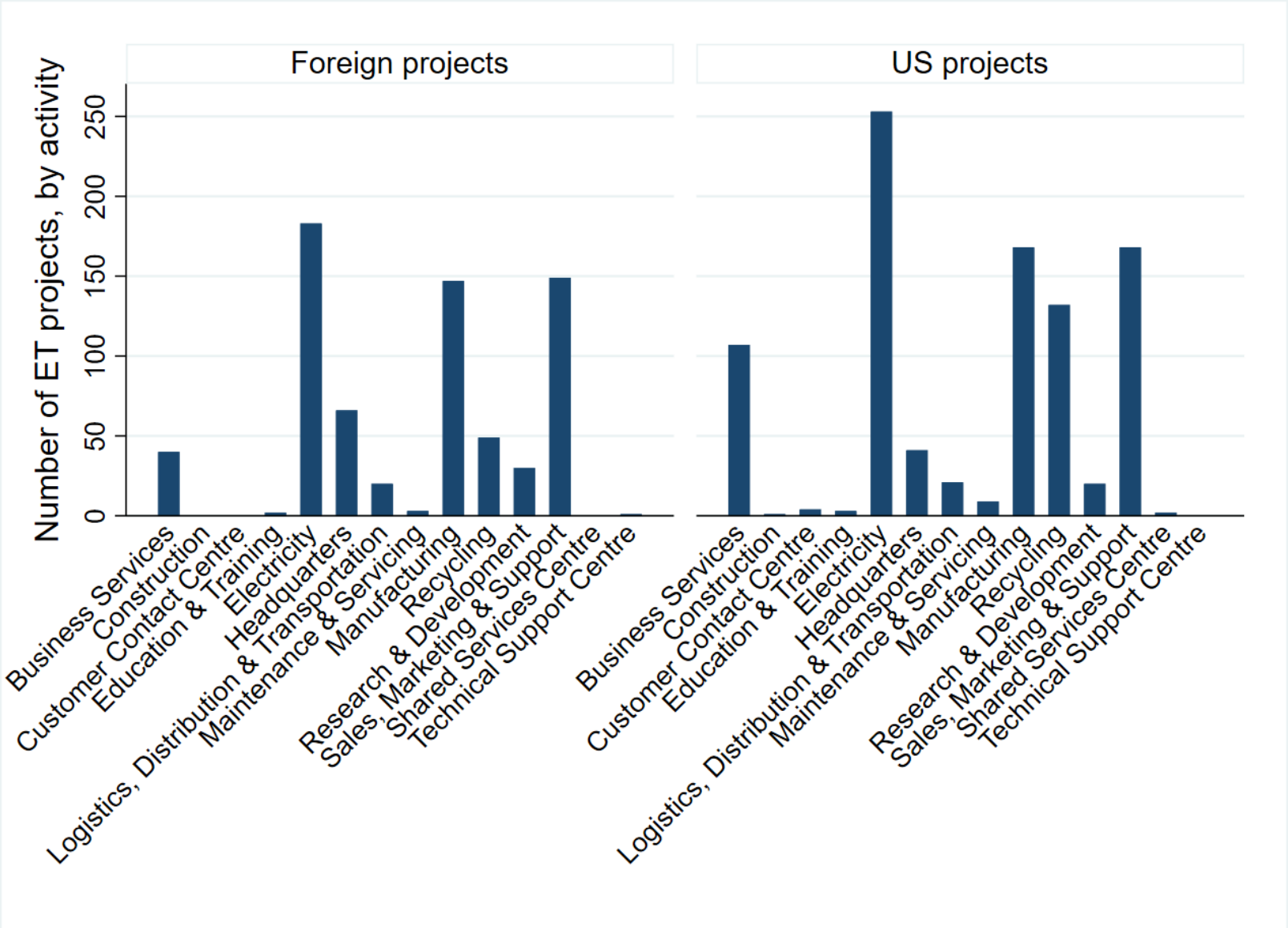
Data cont'd

5. The bulk of ET projects are located in the ren. energy sector.



Data cont'd

6. ET projects are more diverse ito activity: 1) electricity, 2) sales, marketing & support, 3) manufacturing.



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- Agglomeration benefits (lagged cumulative # projects or capex)
- Heterogeneity (firm FE)

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Env controls (source: fDi Markets, IEA, OECD):

- Market size (installed capacity in renewables)
- Energy prices (total real energy end-use price index)
- Green technology (# green patents)

Macro controls (sources: FRED, US census, IMF IFS):

- (F)DI Seasonality (dummies for quarters 1-3 or quarter FE)
- Trade openness $\left(\frac{\text{Imports + Exports from/to RoW}}{\text{Real GDP}}\right)$
- Monetary policy (Fed funds rate)
- Inflation (annual CPI growth)
- State of economy (annual real GDP growth)
- Geographic and language proximity (source-country FE)
- Economic ties with the US (Δ bilateral trade volume)
- Relative wealth of source-country vis-a-vis US investors (Δ bilateral ER)
- Oil spot price

Empirical strategy

Empirical strategy

Objective:

- H1: estimate association between EnvP uncertainty and # of ET greenfield investment & capex of ET greenfield investments in the US ($-$).
- H2: check whether previous result differs by whether source country is US versus foreign ($+/-$).

Steps:

1. Firm-level regressions
   - Poisson regression for # deals (ext. margin)
   - OLS for capex (int. margin)
2. GMM

Empirical strategy cont'd

1. Poisson/OLS regression

$$y_{ijt} = \beta_0 + \beta_1 ET_i \times EnvPU_{t-1} + \beta_2 ET_i \times EnvP_{t-1} + X_t'\theta_1 + X_{t-1}'\theta_2 + \chi_t^{a\prime}\theta_3 + \gamma_i + \gamma_j + \gamma_t + \epsilon_{ijt}$$

where

- y is either ln(#*deals*) or *ln*(*capex*).
- i: firm; j: source country, t: quarter (unless otw noted)
- ET $= 1$ if a firm had an ET deal at some point in the sample.
- X_t and X_{t-1} are vectors of quarterly controls.
- χ_t^a is a vector of annual controls.
- γ's represent fixed effects.
- ϵ_{ijt} is double clustered at the firm and quarter level.

Empirical strategy cont'd

Endogeneity concerns:

1. **Simultaneity**: feedback from ET investment to EnvPU via anticipation of policy-uncertainty induced ET investment fluctuations (lobbies).
   - (i) US EnvP uncertainty is to large extent driven by exogenous presidential elections and Partisan conflict.
   - (ii) The pool of source countries is quite well diversified (even if US firms might organize via lobbies to petition against EnvPs, thereby generating policy uncertainty, less likely the case for foreign firms) $\Longrightarrow$ Verify that effect remains when considering foreign-sourced projects only.

Empirical strategy cont'd

Endogeneity concerns cont'd:

2. **Omitted variable bias**: unobserved factors driving both ET investment flows and US EnvPU.
   - Other forms of policy uncertainty $\Longrightarrow$ Control for EPU.
   - Expectations over business cycle conditions $\Longrightarrow$ Control for consumer confidence and leading index.
3. **Measurement error**: EnvPU index and/or ET investments might be noisy.

Results

Results: # deals (ext margin)

1. Full sample

	(1) Log # deals	(2) Log # deals	(3) Log # deals	(4) Log # deals	(5) Log # deals	(6) Log # deals
EnvPU	0.0019	-0.0079	0.0509		0.0554*	0.0397
	(0.0565)	(0.0531)	(0.0354)		(0.0336)	(0.0369)
EnvP	0.3752***	0.3749***	-0.0268		-0.0265	-0.0094
	(0.0683)	(0.0693)	(0.0570)		(0.0559)	(0.0580)
ET=1	0.0645					
	(0.0585)					
ET=1 × EnvPU	-0.0961**	-0.0957**	-0.1321*	-0.1410*	-0.1334*	-0.1329*
	(0.0436)	(0.0439)	(0.0696)	(0.0745)	(0.0699)	(0.0700)
ET=1 × EnvP	0.2268***	0.2266***	0.3491***	0.3545***	0.3490***	0.3509***
	(0.0433)	(0.0433)	(0.1287)	(0.1285)	(0.1285)	(0.1292)
EPU US					0.0588*	
					(0.0357)	
Sentiment US						-0.0169
						(0.0768)
Leading Index US						0.0706
						(0.0582)
Constant	-4.1114***	-3.8398***	-5.7119***	-2.3364***	-5.9613***	-5.1409***
	(0.0636)	(0.1241)	(0.6681)	(0.5895)	(0.6744)	(0.7999)
Source-country FE	No	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	No	No	Yes	No	No
Seasonal adjustment	Yes	Yes	Yes	No	Yes	Yes
Macro/Env controls	No	No	Yes	Yes	Yes	Yes
Observations	1,500,096	1,496,576	308,089	308,089	308,089	308,089
Firms	23,000	23,000	52,000	52,000	52,000	52,000

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Results: # deals (ext margin)

2. Foreign-only sample

	(1) Log # deals	(2) Log # deals	(3) Log deals	(4) Log # deals	(5) Log # deals	(6) Log # deals
EnvPU	0.0346	0.0500	0.0509		0.0554*	0.0397
	(0.0395)	(0.0462)	(0.0354)		(0.0336)	(0.0369)
EnvP	0.1913***	0.2296***	-0.0268		-0.0265	-0.0094
	(0.0415)	(0.0530)	(0.0570)		(0.0559)	(0.0580)
ET=1	0.1526**					
	(0.0733)					
ET=1 × EnvPU	-0.1116*	-0.0775	-0.1321*	-0.1410*	-0.1334*	-0.1329*
	(0.0597)	(0.0587)	(0.0696)	(0.0745)	(0.0699)	(0.0700)
ET=1 × EnvP	0.3399***	0.3302***	0.3491***	0.3545***	0.3490***	0.3509***
	(0.0628)	(0.0553)	(0.1287)	(0.1285)	(0.1285)	(0.1292)
EPU US					0.0588*	
					(0.0357)	
Sentiment US						-0.0169
						(0.0768)
Leading Index US						0.0706
						(0.0582)
Constant	-4.2703***	-3.9834***	-5.7119***	-2.3364***	-5.9613***	-5.1409***
	(0.0405)	(0.1224)	(0.6681)	(0.5895)	(0.6744)	(0.7999)
Source-country FE	No	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	No	No	No	No	No
Seasonal adjustment	Yes	Yes	Yes	No	Yes	Yes
Macro/Env controls	No	No	Yes	Yes	Yes	Yes
Observations	689,233	685,380	308,089	308,089	308,089	308,089
Firms	11,000	11,000	5,200	5,200	5,200	5,200

Results: # deals (ext margin)

2. Foreign-only sample

	(1) Log # deals	(2) Log # deals	(3) Log deals	(4) Log # deals	(5) Log # deals	(6) Log # deals
EnvPU	0.0346	0.0500	0.0509		0.0554*	0.0397
	(0.0395)	(0.0462)	(0.0354)		(0.0336)	(0.0369)
EnvP	0.1913***	0.2296***	-0.0268		-0.0265	-0.0094
	(0.0415)	(0.0530)	(0.0570)		(0.0559)	(0.0580)
ET=1	0.1526**					
	(0.0733)					
ET=1 × EnvPU	-0.1116*	-0.0775	-0.1321*	-0.1410*	-0.1334*	-0.1329*
	(0.0597)	(0.0587)	(0.0696)	(0.0745)	(0.0699)	(0.0700)
ET=1 × EnvP	0.3399***	0.3302***	0.3491***	0.3545***	0.3490***	0.3509***
	(0.0628)	(0.0553)	(0.1287)	(0.1285)	(0.1285)	(0.1292)
EPU US					0.0588*	
					(0.0357)	
Sentiment US						-0.0169
						(0.0768)
Leading Index US						0.0706
						(0.0582)
Constant	-4.2703***	-3.9834***	-5.7119***	-2.3364***	-5.9613***	-5.1409***
	(0.0405)	(0.1224)	(0.6681)	(0.5895)	(0.6744)	(0.7999)
Source-country FE	No	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	No	No	No	No	No
Seasonal adjustment	Yes	Yes	Yes	No	Yes	Yes
Macro/Env controls	No	No	Yes	Yes	Yes	Yes
Observations	689,233	685,380	308,089	308,089	308,089	308,089
Firms	11,000	11,000	5,200	5,200	5,200	5,200

Results: capex (int margin)

1. Full sample

	(1) Log capex	(2) Log capex	(3) Log capex	(4) Log capex	(5) Log capex	(6) Log capex
EnvPU	0.0009	0.0007	0.0027	0.0000	0.0027	0.0029
	(0.0028)	(0.0027)	(0.0018)	(0.0000)	(0.0017)	(0.0018)
EnvP	0.0185***	0.0187***	-0.0032	0.0000	-0.0032	-0.0035
	(0.0025)	(0.0025)	(0.0021)	(0.0000)	(0.0021)	(0.0023)
ET=1	0.0389***	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.0058)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
ET=1 × EnvPU	-0.0064	-0.0061	-0.0019	-0.0019	-0.0019	-0.0019
	(0.0044)	(0.0044)	(0.0068)	(0.0068)	(0.0068)	(0.0068)
ET=1 × EnvP	0.0283***	0.0291***	0.0292***	0.0292***	0.0292***	0.0293***
	(0.0042)	(0.0045)	(0.0070)	(0.0070)	(0.0070)	(0.0070)
EPU					0.0011	
					(0.0018)	
Sentiment US						0.0025
						(0.0033)
Leading Index US						-0.0021
						(0.0024)
Constant	0.0578***	0.0562***	-0.0442	0.1006***	-0.0482	-0.0616*
	(0.0029)	(0.0060)	(0.0303)	(0.0260)	(0.0308)	(0.0359)
Source-country FE	No	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	No	No	Yes	No	No
Macro/Env controls	No	No	Yes	Yes	Yes	Yes
Firm controls	No	No	No	No	No	No
Observations	1,500,096	1,500,096	320,557	320,557	320,557	320557
Firms	23,000	23,000	5,400	5,400	5,400	5,400
R^2	0.003	0.04	0.03	0.03	0.03	0.03

Results: capex (int margin)

1. Full sample

	(1) Log capex	(2) Log capex	(3) Log capex	(4) Log capex	(5) Log capex	(6) Log capex
EnvPU	0.0009	0.0007	0.0027	0.0000	0.0027	0.0029
	(0.0028)	(0.0027)	(0.0018)	(0.0000)	(0.0017)	(0.0018)
EnvP	0.0185***	0.0187***	-0.0032	0.0000	-0.0032	-0.0035
	(0.0025)	(0.0025)	(0.0021)	(0.0000)	(0.0021)	(0.0023)
ET=1	0.0389***	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.0058)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
ET=1 × EnvPU	-0.0064	-0.0061	-0.0019	-0.0019	-0.0019	-0.0019
	(0.0044)	(0.0044)	(0.0068)	(0.0068)	(0.0068)	(0.0068)
ET=1 × EnvP	0.0283***	0.0291***	0.0292***	0.0292***	0.0292***	0.0293***
	(0.0042)	(0.0045)	(0.0070)	(0.0070)	(0.0070)	(0.0070)
EPU					0.0011	
					(0.0018)	
Sentiment US						0.0025
						(0.0033)
Leading Index US						-0.0021
						(0.0024)
Constant	0.0578***	0.0562***	-0.0442	0.1006***	-0.0482	-0.0616*
	(0.0029)	(0.0060)	(0.0303)	(0.0260)	(0.0308)	(0.0359)
Source-country FE	No	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	No	No	Yes	No	No
Macro/Env controls	No	No	Yes	Yes	Yes	Yes
Firm controls	No	No	No	No	No	No
Observations	1,500,096	1,500,096	320,557	320,557	320,557	320557
Firms	23,000	23,000	5,400	5,400	5,400	5,400
R^2	0.003	0.04	0.03	0.03	0.03	0.03

Results: capex (int margin)

1. Foreign-only sample

	(1) Log capex	(2) Log capex	(3) Log capex	(4) Log capex	(5) Log capex	(6) Log capex
EnvPU	0.0023	0.0023	0.0027	0.0000	0.0027	0.0029
	(0.0019)	(0.0019)	(0.0018)	(0.0000)	(0.0017)	(0.0018)
EnvP	0.0075***	0.0083***	-0.0032	0.0000	-0.0032	-0.0035
	(0.0017)	(0.0019)	(0.0021)	(0.0000)	(0.0021)	(0.0023)
ET=1	0.0383***		0.0000	0.0000	0.0000	0.0000
	(0.0068)		(0.0000)	(0.0000)	(0.0000)	(0.0000)
ET=1 × EnvPU	-0.0063	-0.0050	-0.0019	-0.0019	-0.0019	-0.0019
	(0.0054)	(0.0053)	(0.0068)	(0.0068)	(0.0068)	(0.0068)
ET=1 × EnvP	0.0289***	0.0322***	0.0292***	0.0292***	0.0292***	0.0293***
	(0.0050)	(0.0051)	(0.0070)	(0.0070)	(0.0070)	(0.0070)
EPU US					0.0011	
					(0.0018)	
Sentiment US						0.0025
						(0.0033)
Leading Index US						-0.0021
						(0.0024)
Constant	0.0488***	0.0505***	-0.0442	0.1006***	-0.0482	-0.0616*
	(0.0018)	(0.0041)	(0.0303)	(0.0260)	(0.0308)	(0.0359)
Source-country FE	No	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	No	No	Yes	No	No
Macro/Env controls	No	No	Yes	Yes	Yes	Yes
Firm controls	No	No	No	No	No	No
Observations	689,233	689,231	320,557	320,557	320,557	320,557
Firms	11,000	11,000	5,400	5,400	5,400	5,400
R^2	0.001	0.02	0.03	0.03	0.03	0.03

Results: capex (int margin)

1. Foreign-only sample

	(1) Log capex	(2) Log capex	(3) Log capex	(4) Log capex	(5) Log capex	(6) Log capex
EnvPU	0.0023	0.0023	0.0027	0.0000	0.0027	0.0029
	(0.0019)	(0.0019)	(0.0018)	(0.0000)	(0.0017)	(0.0018)
EnvP	0.0075***	0.0083***	-0.0032	0.0000	-0.0032	-0.0035
	(0.0017)	(0.0019)	(0.0021)	(0.0000)	(0.0021)	(0.0023)
ET=1	0.0383***		0.0000	0.0000	0.0000	0.0000
	(0.0068)		(0.0000)	(0.0000)	(0.0000)	(0.0000)
ET=1 × EnvPU	-0.0063	-0.0050	-0.0019	-0.0019	-0.0019	-0.0019
	(0.0054)	(0.0053)	(0.0068)	(0.0068)	(0.0068)	(0.0068)
ET=1 × EnvP	0.0289***	0.0322***	0.0292***	0.0292***	0.0292***	0.0293***
	(0.0050)	(0.0051)	(0.0070)	(0.0070)	(0.0070)	(0.0070)
EPU US					0.0011	
					(0.0018)	
Sentiment US						0.0025
						(0.0033)
Leading Index US						-0.0021
						(0.0024)
Constant	0.0488***	0.0505***	-0.0442	0.1006***	-0.0482	-0.0616*
	(0.0018)	(0.0041)	(0.0303)	(0.0260)	(0.0308)	(0.0359)
Source-country FE	No	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	No	No	Yes	No	No
Macro/Env controls	No	No	Yes	Yes	Yes	Yes
Firm controls	No	No	No	No	No	No
Observations	689,233	689,231	320,557	320,557	320,557	320,557
Firms	11,000	11,000	5,400	5,400	5,400	5,400
R^2	0.001	0.02	0.03	0.03	0.03	0.03

Conclusions

Conclusions

- Results for EnvP - investments relatively robust for both intensive and extensive margin.
- Results for EnvPU - investments robust for extensive but not intensive margin.
- Possible interpretation: firms withhold new ET deals altogether when faced with EnvPU rather than engaging in less capital-intensive ones.
- Future work: address endogeneity via GMM.

Thanks for your attention.

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Motivation

- Correlation between capex of greenfield investment deals in ‘environmental technology’ (ET) in mln USD and environmental policy (EnvP) in the US.
  - Domestic: 0.63
  - Foreign: 0.61

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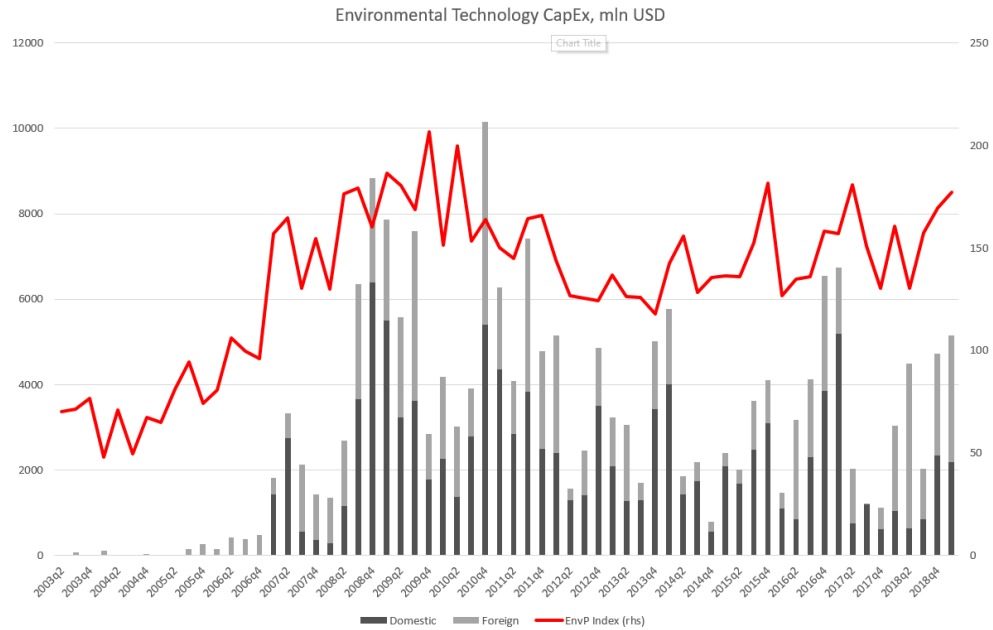

Cluster definitions

Cluster ('who is the company providing it for?')	Definition
Construction	Real estate and building, construction materials, construction machinery & equipment, building products and parts (e.g. windows, doors, insulation etc)
Consumer Goods	Consumer electronics, Accessories, cutlery, DIY, jewellery, toys etc (not retail projects)
Creative Industries	Digital media, media, multi-media, video games, education, training, publishing, news, printing, music, design services, film, broadcasting, TV, architecture, advertising, market research, PR, theatre, cinema.
Energy	Coal, Oil & Gas sector (no retail)
Environmental Technology	Includes alternative/renewable energy sector, recycling, environmental control systems, services for environment etc (no retail)
Financial Services	Accountants, legal advisors, financial analysts, banks, trading
Food, Beverages & Tobacco	Includes all food, beverage and tobacco related projects other than retail projects
ICT & Electronics	Electronics, software & IT services, communications (including broadcasting), business machines & office equipment. Communications related space & defence sector (no retail)
Life sciences	Healthcare, Medical Devices
Industrial	Projects supplying products/services to more than one manufacturing cluster (e.g. transport equip and ICT and food)
Physical Sciences	Chemicals, plastics & rubber, metals, minerals (for each of these, processed industrial products - should not be included and should go into the correct end-user cluster the project is serving)
Professional Services	Legal, accountancy, real estate advisors, consultancy, HR, market research etc
Retail Trade	All consumer products retail, all retail from other sectors, all restaurants
Tourism	Hotels, tourism, leisure & entertainment (no retail)
Transport Equipment	Auto components, Automotive OEM, Misc. transport equipment, space & defence projects, except communications related (no retail)
Transportation, Warehousing & Stor	Includes production of bulk container, bulk storage, transportation pipe production e.g. for gas, water etc
Wood, Apparel & Related Products	Paper, packaging, (not packaging machines, metals or plastics), textiles, wood, (No retail)

Source: fDi Markets.

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