Pollution Permits and Financing Costs

Discussion

Johannes Poeschl*

*Danmarks Nationalbank

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Relevance

Big picture question: can finance contribute to a green transition?

Antoniou, Delis, Ongena, and Tsoumas (2021): studies effects of moving from phase II to phase III of the European Union Emission Trading System (EU ETS) on borrowing costs.

Surprising & novel finding: firms participating in EU ETS saw a decline in borrowing costs relative to firms not participating after phase III was introduced (opposite finding to Ivanov, Kruttli, and Watugala (2021)!).

Real effects: Absent this decline, exposed firms would have reduced carbon emissions by 7.9% more.

Key theoretical mechanism

Firms have an incentive to store emission certificates pre-phase III:

Storage decision of a firm in phase II:

$$\frac{\partial \text{Equity Value}_{pre}}{\partial \text{Stored Emissions}_{pre,post}} = \underbrace{\Delta_{pre,post}\text{Carbon Price}}_{\text{Arbitrage}} \underbrace{- \frac{\partial \text{Lending Rate}_{post}}{\partial \text{Stored Emissions}_{pre,post}} \times \text{Firm Leverage}_{post}}_{\text{Precautionary Saving}}$$

Arbitrage motive: firms can benefit from higher (expected) emission certificate prices in phase III.

Precautionary savings motive: firms use stored emissions as a savings technology (in fact, this is their only means of saving in the model) to "outsave" default risk in phase III.

Comment #1: direct evidence on storage

Null hypothesis: firms did not use or sell the certificates in phase II because they didn't need them and selling them was too much of a hassle.

Suggestion: it would be very useful to have some direct evidence on firm behavior consistent with forward-looking emission storage.

For example, your model implies that firms should store more emission certificates if:

- expected emission certificate price growth is higher
- firms are more leveraged
- firms' interest rates are more sensitive to fundamentals

Note that firms should use any other types of savings policies in the same way.

Comment #2: where is the mispricing?

Narrative of the paper: effect of lower borrowing costs offsets a desirable tightening in regulation for polluting firms.

But isn't it a good thing that the EU ETS seemingly didn't create transition risk, and that this *lack of risk* was priced?

- Pricing of risks seems to otherwise work as intended (see Table 7, Ivanov et al. (2021), Huang et al. (2021)).
- There is evidence that it was effective in cutting emissions without having adverse carbon leakage effects (Dechezleprêtre et al. (2019)) or impairing economic activity (Colmer et al. (2020)).

Whether banks should charge a "carbon premium" seems to me a separate issue from whether banks should price default risk (see also Table 9).

Suggestion: could you discuss to what extent the reduction in credit spreads is driven by a reduction in default risk as opposed to a lower risk premium?

Pricing of fundamentals seems to work as expected

	(1)	(2)	(3)	(4)	(5)
Treated	-0.220	-0.155	-0.144	-0.151	-0.147
	(-1.56)	(-1.21)	(-1.21)	(-1.19)	(-1.20)
3rd phase dummy	0.315***	0.051	0.040	0.041	0.144
	(2.91)	(1.00)	(0.73)	(0.76)	
Treated × 3rd phase dummy	-0.751***	-1.423***	-0.275***	-0.253**	-2.473***
	(-3.55)	(-3.01)	(-2.84)	(-2.55)	
EUA price	0.058***	0.061***	0.063***	0.063***	0.055***
	(4.22)	(5.35)	(5.67)	(5.64)	(4.12)
Treated × EUA price	0.018				0.015
	(0.87)				(0.69)
3rd phase dummy × EUA price	-0.153**				-0.053
	(-2.49)				
Treated × 3rd phase dummy × EUA price	0.306***				0.364**
	(2.71)				
Costly allocated allowances	0.204	0.208	0.077	0.192	0.090
	(1.10)	(1.13)	(0.39)	(1.08)	(0.45)
Treated × 3rd phase dummy × Costly allocated allowances			0.197		0.230
			(1.26)		(1.35)
Allocated allowances	-0.036	-0.076	0.000	-0.050	-0.034
	(-0.82)	(-1.21)	(0.00)	(-1.01)	(-0.42)
Treated × 3rd phase dummy × Allocated allowances				0.061	0.116*
				(0.83)	(1.76)
Bought / sold allowances		-0.144***			-0.138***
		(-4.41)			
Treated × 3rd phase dummy × Bought / sold allowances		0.161**			0.200***
		(2.49)			

Antoniou et al. (2021), Table 7

Even UNEPFI banks do not price differently

	(1)	(2)	(3)
Treated	0.028	0.027	0.031
	(0.27)	(0.25)	(0.29)
Treated × 3rd phase dummy	-0.259***	-0.275***	-0.276***
	(-3.53)	(-3.64)	(-3.74)
Treated × UNEPFI banks	-0.005	-0.007	-0.006
	(-0.58)	(-0.97)	(-0.42)
3rd phase dummy × UNEPFI banks	-0.023**	-0.025**	-0.027
	(-2.15)	(-2.30)	(-1.24)
Treated × 3rd phase dummy × UNEPFI banks	0.032*	0.038**	0.026
	(1.89)	(2.23)	(0.98)

Antoniou et al. (2021), Table 9

Comment #3: what about the long-run effect?

Pro-active storage of CO2 emission certificates helps firms to smooth transition to a tighter regulatory regime.

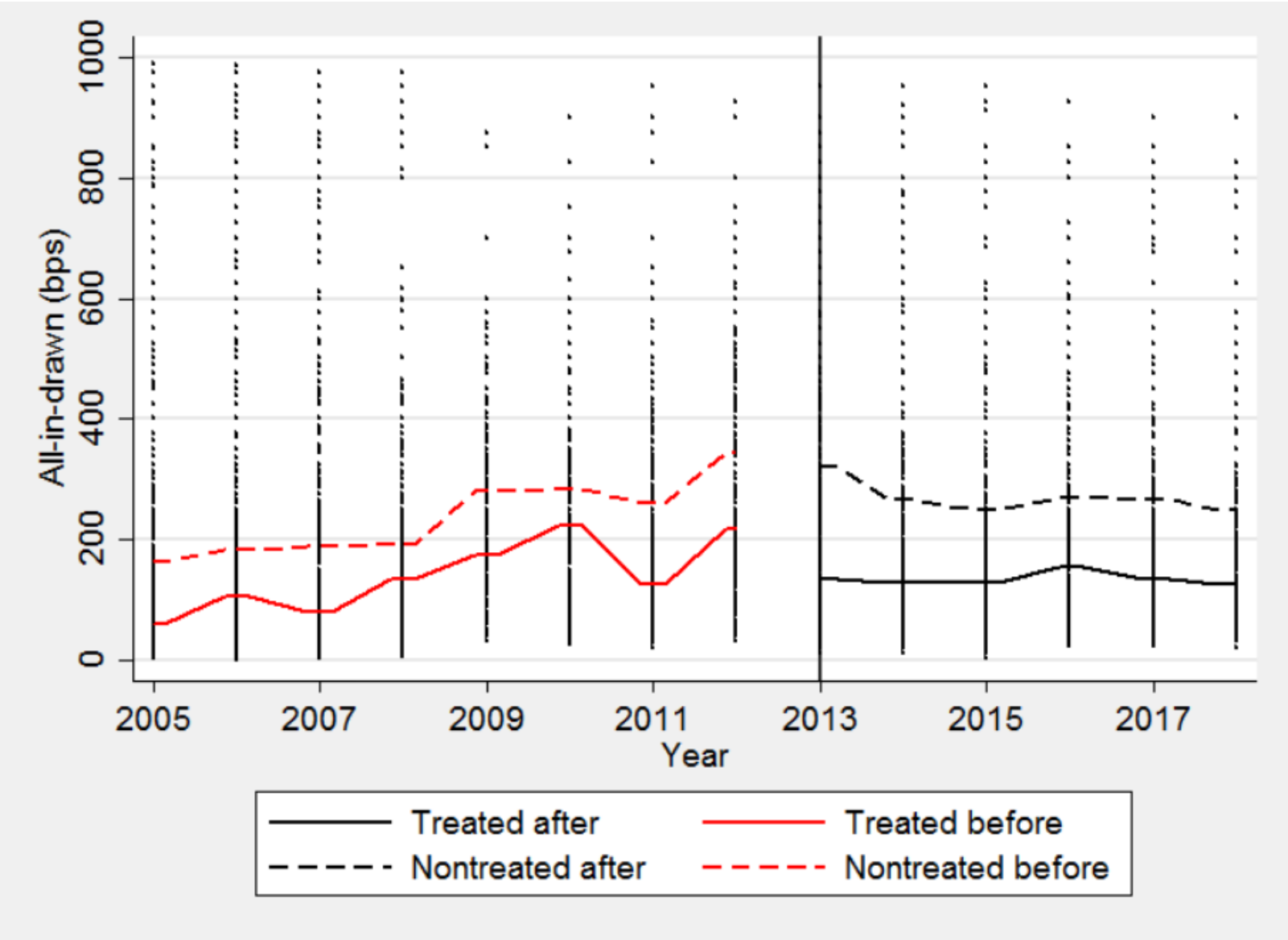
That will only work for so long, before firms adjust to the new long-run equilibrium.

The difference in spreads that you identify seems to narrow after a few years (see Figure 4).

Is the effect you identify relevant for the long-run effectiveness of the emission trading system?

Suggestion: could you repeat your exercise excluding the transition years, or do an event study type exercise?

Effect seems to be driven by short-run adjustment



Antoniou et al. (2021), Figure 4

- Antoniou, Fabio et al. (2021). "Pollution permits and financing costs." In: *Unpublished Manuscript*.
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- Dechezleprêtre, Antoine et al. (2019). "Searching for Carbon Leaks in Multinational Companies." In: *Unpublished Manuscript*.
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- Ivanov, Ivan T et al. (2021). "Banking on Carbon: Corporate Lending and Cap-and-Trade Policy." In: *Unpublished Manuscript*.