

Appendix

Market Responses to Global Governance: International Climate Cooperation and Europe's Carbon Trading

Impact of Emissions Regulations on Firm Profits as Emissions Allowances Vary

To clarify how global multilateral decisions related to the supply of international carbon credits can affect the profit of private firms regulated by cap-and-trade in Europe, consider European firm i producing in the EU market. The market is represented by the demand curve, $P(q_i + q_{\neq i})$, where $q_{\neq i}$ represents total production by other firms. The total cost of production is C_i . Each regulated firm is subject to a trading scheme of greenhouse gas emissions, which is a function of its emissions rate, r_i , its total production, q_i , and level of abatement, I_i (Bushnell et al 2013).

Under cap-and-trade the level of abatement determines an emission rate $r_i(q_i, I_i)$, and an abatement cost, $k(I_i)$. Now assume that the per-unit price of emissions allowances is τ , a direct compliance cost. If the firm possesses allowances A_i equal to its initial allocation less net sales, considering both input and environmental costs the profits of firm i can be represented as π .

$$\pi_i = P(q_i + q_{\neq i}) q_i - C_i(q_i) + \tau A_i - \tau r_i(q_i, I_i) q_i - k(I_i).$$

An exogenous shock to permit prices that does not hurt production costs but, de facto, strengthens options for zero-cost abatement should increase the profits of firm i , because the derivative for profits $(\delta\pi_i / \delta\tau)$ are always **positive** with positive quantities of allowances A_i . Thus, an event that provides a firm with always-cheaper options for status-quo production should boost the firm stock value, ceteris paribus.

Table A.1: Sampled EU ETS companies

ATKINS	EADS
ASTRAZENECA	ERAMET
BAE SYSTEMS	EIFFAGE
BRITISH AMERICAN TOBACCO	AKZO NOBEL
BG GROUP	ENEL
BHP BILLITON	ENI
BP	FORTUM
CENTRICA	CIMPOR
CRH	EDP ENERGIAS DE PORTUGAL
BMW	KONINKLIJKE DSM
CONTINENTAL	ABB
CLARIANT	CIBA N
E ON	SHELL
FRESENIUS	ATEL HOLDING
DIAGEO	BOLIDEN
DANISCO	MOLLER - MAERSK
ACERINOX	AIR LIQUIDE
AIR LIQUIDE	ALSTOM
ALSTOM	DANONE

This table lists the 38 selected EU ETS firms analyzed in this paper.

Table A.2: Coding of the UNFCCC Outcome Variable: Emission Trading Scheme Debates at the UNFCCC and Excerpts from the Earth Negotiations Bulletin

Date	Decision Excerpt	Outcome (Code)
28 November 2005	COP 11's agenda included items on capacity building and technology transfer, the adverse effects of climate change on developing and least developed countries, and several financial and budget related issues, including the report of the Global Environment Facility [its impacts on capacity building]. [...] Parties took decisions on technology transfer, LULUCF, the UNFCCC's financial mechanisms, and education, training and public awareness.	Agreement on support for capacity building for emission trading credits (Good Outcome = 1)
30 November 2005	On implications of the establishment of new facilities to obtain credits under the CDM for the destruction of HFC-23 (FCCC/SBSTA/2005/INF.8 and /MISC.10 and /MISC.11), Parties stressed the need to [proceed with financial mechanisms and] avoid perverse incentives.	Agreement on sustaining credit provision via CDM integration (Good Outcome = 1)
1 December 2005	The delegates noted the linking of the EU emissions trading scheme to the Kyoto mechanisms, and concerns that the CDM process needs to be improved to deliver projects and CERs on the scale sought by Parties.	Agreement on sustaining credit provision via CDM integration (Good Outcome = 1)
6 December 2005	The Co-Chairs introduced a draft decision, noting that while the decision would apply, mutatis mutandis, the MOU with respect to guidance to the entity entrusted with the operation of the financial mechanism of the Convention, it would not apply to the Adaptation Fund, as no decision has been taken on the operational entity for that fund. [...] Highlighting the need to assist vulnerable countries, developing countries suggested levying 2% of JI Emissions Reduction Units (ERUs) for the Adaptation Fund.	Agreement on sustaining credit provision via CDM integration (Good Outcome = 1)
14 November 2006	The contact group convened briefly in the evening to introduce the Co-Chairs' draft conclusions on the GEF's report to the COP; a draft decision on the review of the financial mechanism; and a draft decision on additional guidance to the GEF.	Agreement on support for capacity building for emission trading credits (Good Outcome = 1)
15 November 2006	Tina Guthrie (Canada) reported on the outcomes of the contact group where delegates resolved the outstanding issue on the fourth review of the financial mechanism. [...] With agreement on the majority of items under the financial mechanism, some delegates reportedly glimpsed the first steps in the confidence building process that will be required to pull together a post-2012 regime.	Agreement on sustaining credit provision (Good Outcome = 1)
17 November 2006 (from ENB summary of 20 November 2008)	[The group] welcomes the fact that Belarus will use any revenue generated under emissions trading for further greenhouse gas abatement measures, subject to approval by the relevant authorities in the country. [...] The EU emissions trading scheme is likely to form the cornerstone of a global scheme. [...] Parties agreed on the need to continue deliberating on this option, but disagreements surfaced on the institutions to which the CERs would be issued, and on what to do with the 'remaining' credits left after the project costs were met. [...] China supported issuing the credits to the host government account rather than to another institution and that the credits be used to fund other activities beneficial to the global environment. [...] Brazil, the EU and others supported issuing the credits to another institution and either canceling the credits or using them to fund activities that include means to phase out the production and consumption of HCFCs.	Agreement on sustaining credit provision (Good Outcome = 1)

continues

Date	Decision Excerpt	Outcome (Code)
8 December 2007	Delegates discussed issues such as costs, the inclusion of non-CO2 gases in the EU Emissions Trading Scheme (ETS), and the agriculture sector. [...] Senegal, Argentina and others opposed crediting the destruction of HFC-23 in new facilities under the CDM.	Partial agreement on capacity building; disagreement on sectoral divisions of credits (Good Outcome = 0)
15 December 2007 (from ENB summary of 18 December 2007)	While parties agreed to request submissions on extending the share of proceeds to JI and emissions trading, Ukraine and the Russian Federation expressed reservations at the closing plenary, stating that this proposal would hinder the implementation of these mechanisms in their countries	Partial agreement on capacity building; disagreement on sectoral divisions of credits (Good Outcome = 0)
2-3 December 2008	The Least Developed Countries (LDCs) supported enhancing the financial mechanism under the COP, and highlighted the importance of national adaptation programmes of action (NAPAs).	Agreement on support for capacity building for emission trading credits (Good Outcome = 1)
4 December 2008	In the contact group, delegates discussed the heavily bracketed text for a draft decision on the fourth review compiled at SBI 28. China and South Africa supported simplifying accreditation of Designated Operational Entities (DOEs) and China and others called for more transparency. The EU warned that reduction goals could be weakened depending on the rules adopted for LULUCF, carbon credits and bunker fuels.	Agreement on sustaining credit provision via auditors (Good Outcome = 1)
10 December 2008	Delegates met on Tuesday afternoon to consider a new draft text, which contains, inter alia: three different options on extending the share of proceeds to JI and emissions trading. [...] The mood seemed less upbeat, with some frustration expressed after talks bogged down on the financial mechanism, Adaptation Fund and LDC Fund. [...] Informal consultations focusing on the operational aspects and distribution of CDM projects continued on Tuesday, based on a new draft text addressing, inter alia, transparency of the CDM Executive Board's decision making, accreditation of DOEs and application of financial penalties to non-complying DOEs.	Disagreement on credit provision (Good Outcome = -1)
13 December 2008 (from ENB summary of 15 December 2008)	[There was] lack of agreement on extending the share of proceeds (or "adaptation levy") to Joint Implementation and emissions trading under the second review of the Protocol under Article 9. [...] Developed countries generally expressed their satisfaction with the GEF's performance, while developing countries had numerous concerns, particularly with regard to the GEF's fifth replenishment, complementarity of the financial mechanism to other sources of financing, proliferation of funds outside of the Convention and outcomes of the mid-term review of the Resource Allocation Framework (RAF).	Disagreement on credit provision (Good Outcome = -1)

continues

Date	Decision Excerpt	Outcome (Code)
10-12 December 2009	On the fourth review of the financial mechanism, the EU proposed streamlining the draft conclusions. [...] The EU representative] highlighted actions taken to operationalize the Adaptation Fund, including: adoption of policies and guidelines for accessing funds; commencement of the monetization of Certified Emission Reductions (CERs); and the decision to accept Germany's offer to confer legal capacity on and host the Board. [...] Some parties preferred to house a matching function or registry within a financial mechanism, while others said that matching functions should remain within the purview of the drafting group [...] Co-Chair Lei noted progress made under this agenda item but said that the contact group needs more time to finish its work.	Partial agreement on capacity building and issuing of credits (Good Outcome = 0)
15 December 2009	On emissions trading, New Zealand noted interest in extending emissions trading to developing countries and proposed text reflecting this. The EU, supported by NEW ZEALAND and others, proposed a paragraph establishing new market-based mechanisms. This was opposed by ARGENTINA and VENEZUELA. [...] Venezuela opposed the establishment of new market-based-mechanisms and proposed inserting a footnote stating that this would require a Protocol amendment, and also noted that this issue is being addressed under the AWG-LCA.	Disagreement on credit provision and market integration (Good Outcome = -1)
18 December 2009	The COP adopted a decision on the fourth review of the financial mechanism referred to it by the SBI. In its decision (FCCC/SBI/2009/L.29), the COP requests the SBI to continue its consideration of the fourth review of the financial mechanism at SBI 32, with a view to recommending a draft decision for adoption by COP 16. The COP also decides to complete the consideration of the fourth review of the financial mechanism at COP 16.	Disagreement on credit provision and market integration; agreement on continuing discussion at next COP (Good Outcome = -1)
3-4 December 2010	[...] Parties discussed whether progress could be made on various issues including: nuclear power under the CDM; use of standardized baselines; co-benefits; use of Certified Emission Reductions (CERs) from project activities in certain host countries; discount factors; share of proceeds; emissions trading; and supplementarity. [...] Parties then discussed whether credits can be issued from projects in countries such as Belarus that are in the process of becoming Protocol Annex B parties. [...] AWG-KP Vice-Chair Macey said the group had refined options on the possible inclusion of carbon capture and storage (CCS) under the CDM and that parties are consulting on the use of Certified Emission Reductions (CERs) generated from projects in certain countries.ä	Partial agreement on capacity building and issuing of credits (Good Outcome = 0)
8-10 December 2010 (also from ENB summary of 15 December 2008)	On the flexibility mechanisms, AWG-KP Vice-Chair Adrian Macey (New Zealand) highlighted the focus of discussions on enhancing co-benefits under the CDM and increasing the use of Certified Emission Reductions from certain host countries. [...] Parties discussed a paragraph allowing crediting from JI projects after the first commitment period, using Assigned Amount Units (AAUs) from the first commitment period. Parties [engaged] in extensive debate over text dealing with [...] the process and requirements for the accreditation of national implementing entities. [...] Going through the text, parties agreed on all paragraphs apart from par. 52 on the Executive Board revising the procedures for CDM project registration to allow the crediting period to start from the date that a complete request for registration has been submitted, which was bracketed at the request of Bolivia.	Partial agreement on capacity building and issuing of credits (Good Outcome = 0)

Table A.3: The impact of UNFCCC decisions on the returns of EU ETS firms, 2005-07

	<i>AAR_{it} Models</i>		<i>AR_{it} Models</i>	
	(1)	(2)	(3)	(4)
<i>Good UNFCCC Outcome</i>	0.070*** (0.019)	0.068*** (0.020)	0.088+ (0.050)	0.17* (0.082)
<i>National Elections</i>		0.076*** (0.022)		-0.14* (0.061)
<i>Domestic Policy</i>		0.077+ (0.044)		0.37+ (0.22)
<i>Relevant Web Searches δ</i>		0.003*** (0.008)		0.027+ (0.014)
<i>Relevant Web Searches_{t-1}</i>		0.005*** (0.001)		0.016** (0.005)
<i>Carbon Price δ</i>		0.024** (0.0078)		0.057 (0.043)
<i>Carbon Price_{t-1}</i>		0.026** (0.0090)		0.11* (0.048)
<i>Constant</i>	-0.060*** (0.004)	-0.78*** (0.23)	-0.077*** (0.0070)	-2.68** (1.03)
N	1582	1094	1360	983
Firms	38	38	38	38
Fixed effects	yes	yes	yes	yes
R ²	0.016	0.004	0.002	0.004

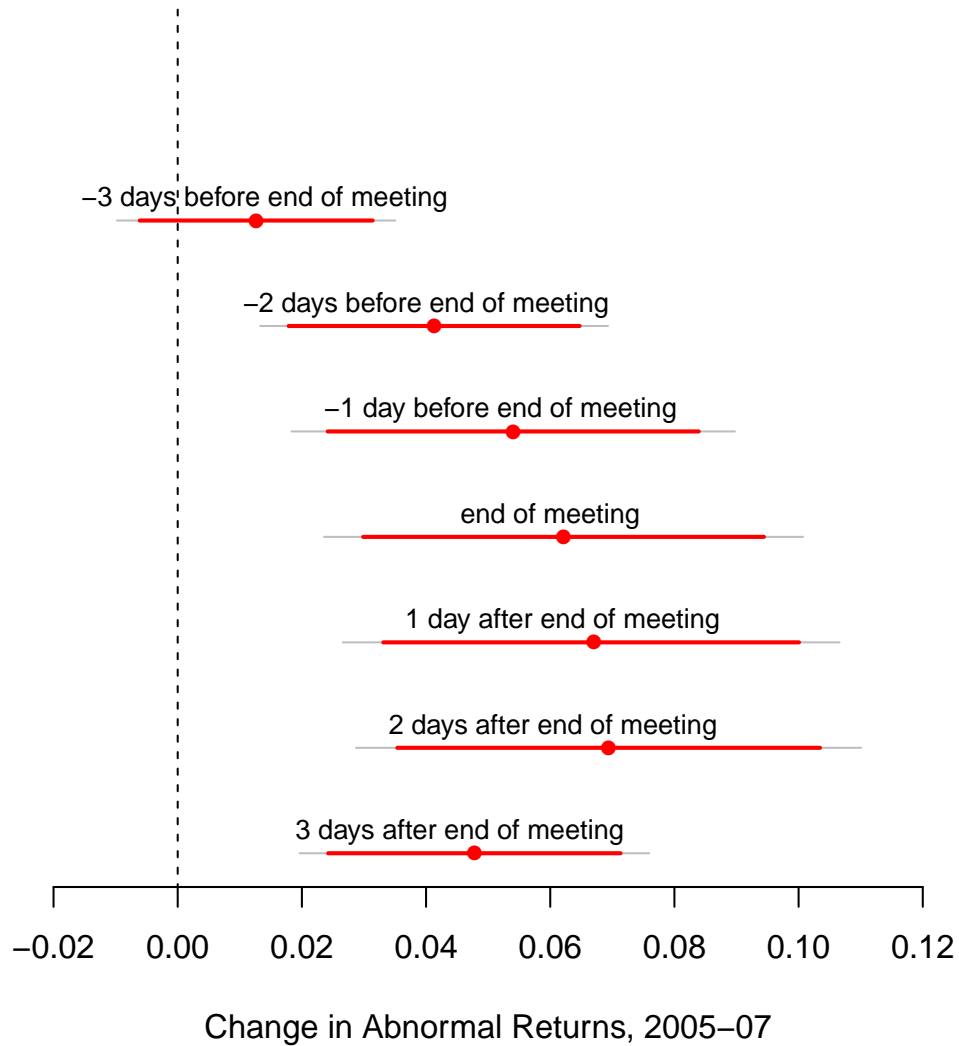
Linear coefficients. Robust standard errors in parentheses. The outcome variable for Models 1 and 2 is AAR_{it} , while the outcome variable for Models 3 and 4 is AR_{it} . Firm, country and COP fixed effects estimated but not reported. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table A.4: The impact of UNFCCC decisions on the returns of EU ETS firms: Alternative Event Windows, 2005-07

	<i>AAR_{it} Models</i>						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	<i>Cop end -3</i>	<i>Cop end -2</i>	<i>Cop end -1</i>	<i>Cop end</i>	<i>Cop end +1</i>	<i>Cop end +2</i>	<i>Cop end +3</i>
<i>Good UNFCCC Outcome</i>	0.013 (0.012)	0.041** (0.015)	0.054** (0.019)	0.062** (0.020)	0.069** (0.022)	0.072** (0.022)	0.051** (0.020)
<i>National Elections</i>	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.001 (0.004)	0.013+ (0.007)	0.016* (0.006)	0.076** (0.022)
<i>Domestic Policy</i>	0.048 (0.053)	0.073 (0.055)	0.090 (0.058)	0.094 (0.059)	0.10+ (0.060)	0.11+ (0.060)	0.075+ (0.044)
<i>Relevant Web Searches δ</i>	0.000 (0.001)	0.001 (0.001)	0.002+ (0.001)	0.002* (0.001)	0.003* (0.001)	0.003** (0.001)	0.003** (0.001)
<i>Relevant Web Searches_{t-1}</i>	0.004* (0.002)	0.005** (0.002)	0.005** (0.002)	0.005** (0.002)	0.005** (0.002)	0.006** (0.002)	0.005** (0.001)
<i>Carbon Price δ</i>	0.001 (0.008)	0.013 (0.008)	0.019+ (0.009)	0.020* (0.009)	0.024* (0.010)	0.027** (0.009)	0.024** (0.008)
<i>Carbon Price_{t-1}</i>	0.028* (0.011)	0.029* (0.011)	0.029* (0.011)	0.029** (0.011)	0.030** (0.011)	0.031** (0.011)	0.026** (0.0089)
<i>Constant</i>	-0.72** (0.25)	-0.79** (0.26)	-0.83** (0.27)	-0.84** (0.27)	-0.87** (0.28)	-0.91** (0.28)	-0.77** (0.22)
N	566	679	792	867	980	1018	1094
Firms	38	38	38	38	38	38	38
Fixed effects	yes	yes	yes	yes	yes	yes	yes
R ²	0.18	0.16	0.16	0.16	0.16	0.16	0.16

Linear coefficients. Robust standard errors in parentheses. The outcome variable is AAR_{it} . The estimations are based on the time series truncated, respectively, at 3 days before the end of the COP meeting; 2 days before the end of the COP meeting; 1 day before the end of the COP meeting, the ending day of the COP meeting; 1 day after the end of the COP meeting; 2 days after the end of the COP meeting; and 3 days after the end of the COP meeting. Firm, country and COP fixed effects estimated but not reported. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure A.1: The Impact of UNFCCC Decisions About Abatement Credits ('Good Outcomes') on EU ETS returns: Time Span of the Effect



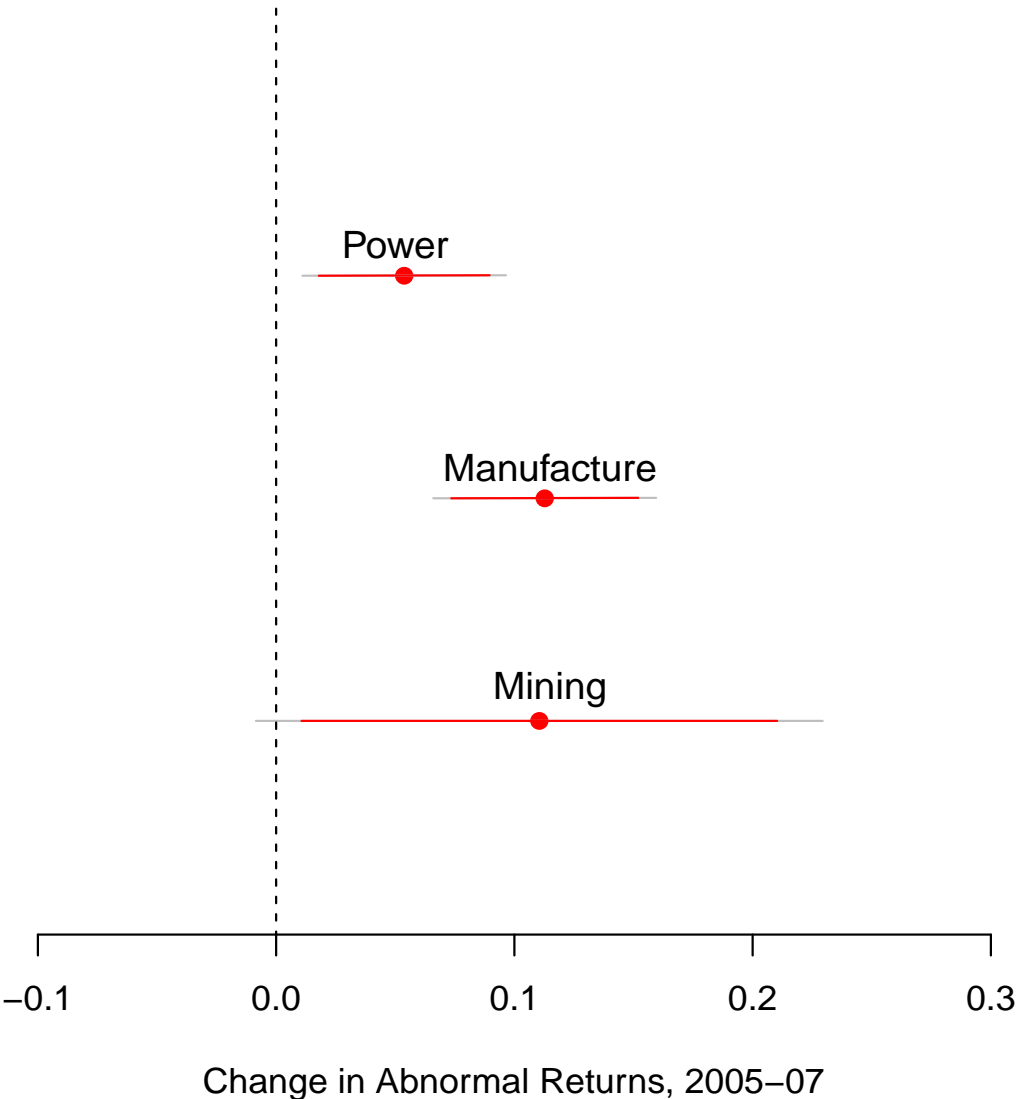
The figure illustrates the effect of *Good UNFCCC Outcome* as estimated in several fully specified linear models where the estimation window is truncated at the noted date of the COP. The outcome variable is the firms' Average Abnormal Returns. Each dot corresponds to the estimated coefficient, while the grey and coloured lines correspond to the 95% and 90% confidence intervals, respectively. See Appendix for the regression tables with the complete set of estimated parameters.

Table A.5: The impact of UNFCCC decisions on the returns of EU ETS firms: Average Abnormal Returns by Sector, 2005-07

	<i>AAR_{it} Models</i>		
	(1) Mining	(2) Manufacture	(3) Power
<i>Good UNFCCC Outcome</i>	0.11 ⁺ (0.061)	0.11*** (0.024)	0.054* (0.022)
<i>National Elections</i>	0.061 (0.076)	0.060* (0.030)	0.032 (0.027)
<i>Domestic Policy</i>	0.15 (0.093)	0.060 ⁺ (0.033)	-0.075* (0.031)
<i>Relevant Web Searches δ</i>	0.001 (0.005)	0.001 (0.002)	0.001 (0.002)
<i>Relevant Web Searches_{t-1}</i>	0.005* (0.002)	0.005*** (0.001)	0.003*** (0.001)
<i>Carbon Price δ</i>	0.034 (0.028)	0.013 (0.011)	-0.006 (0.010)
<i>Carbon Price_{t-1}</i>	0.044*** (0.009)	0.022*** (0.003)	-0.005 ⁺ (0.003)
<i>Constant</i>	-1.19*** (0.19)	-0.72*** (0.070)	-0.070 (0.066)
N	203	377	398
Firms	7	13	14
Fixed effects	yes	yes	yes
R ²	0.18	0.28	0.098

Linear coefficients. Robust standard errors in parentheses. The outcome variable is AAR_{it} . Firm and country fixed effects estimated but not reported. ⁺ $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure A.2: The Impact of UNFCCC Decisions About Abatement Credits ('Good Outcomes') on EU ETS returns: Subgroup Results by Sector



The figure illustrates the effect of *Good UNFCCC Outcome* as estimated in three fully specified linear fixed effects models based on three sector-based subsamples. These subsamples include power companies, manufacture companies, and mining companies, respectively. The outcome variable is the firms' Average Abnormal Returns. Each dot corresponds to the estimated coefficient, while the grey and coloured lines correspond to the 95% and 90% confidence intervals, respectively.

Table A.6: The impact of UNFCCC decisions on the returns of EU ETS firms: Phase II, 2008-10

	AAR_{it}		AR_{it}		AAR_{it}		AR_{it}	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Good UNFCCC Outcome</i>	0.050 (0.043)	-0.001 (0.016)	-0.45 (0.36)	-0.62 (0.56)				
<i>Good Outcome: Binary</i>					0.68 (0.51)	0.11 (0.11)	0.16 (0.17)	-0.43 ⁺ (0.24)
<i>National Elections</i>		0.24 (0.22)	-0.81 (0.54)			0.24 (0.22)		-0.82 (0.56)
<i>Domestic Policy</i>		0.67 (0.54)	-2.11 (1.95)			0.67 (0.54)		-2.05 (1.89)
<i>Relevant Web Searches_{t-1}</i>		-0.004 (0.005)	0.028 (0.023)			-0.004 (0.005)		0.023 (0.018)
<i>Carbon Price δ</i>		0.015 (0.021)	-0.76 (1.16)			0.020 (0.023)		-0.66 (1.07)
<i>Carbon Price_{t-1}</i>		-0.10 (0.092)	-0.24 (0.23)			-0.10 (0.092)		-0.24 (0.23)
<i>Constant</i>	-0.12*** (0.003)	1.75 (1.73)	-0.16*** (0.029)	2.56 (2.92)	-0.15*** (0.016)	1.76 (1.73)	-0.13*** (0.005)	2.78 (3.13)
N	3626	2849	3626	2849	3626	2849	3626	2849
Firms	38	38	38	38	38	38	38	38
Fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
R ²	0.001	0.023	0.001	0.001	0.001	0.023	0.001	0.001

Linear coefficients. The outcome variable for Models 1-2 and 5-6 is AAR_{it} , while the outcome variable for Models 3-4 and 7-8 is AR_{it} . Firm, country and COP fixed effects estimated but not reported, while *Relevant Web Searches* δ is omitted because of collinearity. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table A.7: The impact of UNFCCC decisions on the returns of EU ETS firms, 2005-07: Excluding UK Companies

	2005-07		2008-2010	
	(1)	(2)	(3)	(4)
	AAR _{it}	AR _{it}	AAR _{it}	AR _{it}
<i>Good UNFCCC Outcome</i>	0.10*** (0.025)	0.26* (0.11)	0.006 (0.024)	-0.91 (0.80)
<i>National Elections</i>	0.12*** (0.028)	-0.11 (0.081)	0.36 (0.31)	-0.92 (0.78)
<i>Domestic Policy</i>	0.13** (0.041)	0.70+ (0.37)	0.95 (0.76)	-3.10 (2.77)
<i>Relevant Web Searches δ</i>	0.005*** (0.001)	0.038+ (0.020)	0.000 (0.000)	0.000 (0.000)
<i>Relevant Web Searches_{t-1}</i>	0.007*** (0.002)	0.024** (0.008)	-0.001 (0.007)	-0.041 (0.033)
<i>Carbon Price δ</i>	0.035** (0.010)	0.099 (0.063)	0.032 (0.030)	-1.11 (1.66)
<i>Carbon Price_{t-1}</i>	0.039** (0.011)	0.18* (0.077)	-0.15 (0.13)	-0.35 (0.33)
<i>Constant</i>	-1.14*** (0.28)	-4.22* (1.64)	2.55 (2.46)	3.64 (4.17)
N	783	702	2002	2002
Firms	27	27	26	26
Fixed effects	yes	yes	yes	yes
R ²	0.21	0.043	0.033	0.002

Linear coefficients. Robust standard errors in parentheses. Firm and COP fixed effects estimated but not reported. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table A.8: The impact of UNFCCC decisions on the returns of EU ETS firms, 2005-07: Country Clustered Standard Errors

	<i>2005-07</i>		<i>2008-2010</i>	
	(1)	(2)	(3)	(4)
	AAR _{it}	AR _{it}	AAR _{it}	AR _{it}
<i>Good UNFCCC Outcome</i>	0.068* (0.019)	0.17 (0.10)	-0.001 (0.016)	-0.62 (0.59)
<i>National Elections</i>	0.076+ (0.018)	-0.14* (0.055)	0.24 (0.22)	-0.81 (0.59)
<i>Domestic Policy</i>	0.075 (0.066)	0.37 (0.28)	0.67 (0.57)	-2.11 (2.04)
<i>Relevant Web Searches δ</i>	0.003* (0.001)	0.027 (0.017)	0.000 (0.000)	0.000 (0.000)
<i>Relevant Web Searches_{t-1}</i>	0.005* (0.001)	0.016+ (0.006)	-0.004 (0.005)	0.028 (0.024)
<i>Carbon Price δ</i>	0.024+ (0.011)	0.056 (0.032)	0.015 (0.024)	-0.76 (1.24)
<i>Carbon Price_{t-1}</i>	0.026 (0.013)	0.11 (0.060)	-0.10 (0.096)	-0.24 (0.24)
<i>Constant</i>	-0.77+ (0.29)	-2.61 (1.26)	1.75 (1.79)	2.56 (3.04)
N	1094	983	2849	2849
Firms	38	38	37	37
Fixed effects	yes	yes	yes	yes
R ²	0.16	0.031	0.034	0.001

Linear coefficients. Country clustered standard errors in parentheses. Firm and COP fixed effects estimated but not reported. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table A.9: The impact of UNFCCC decisions on the returns of EU ETS firms: Sector Clustered Standard Errors

	2005-07		2008-2010	
	(1)	(2)	(3)	(4)
	AAR _{it}	AR _{it}	AAR _{it}	AR _{it}
<i>Good UNFCCC Outcome</i>	0.068* (0.019)	0.17 (0.10)	-0.001 (0.014)	-0.62 (0.51)
<i>National Elections</i>	0.076* (0.018)	-0.14+ (0.055)	0.24 (0.19)	-0.81 (0.60)
<i>Domestic Policy</i>	0.075 (0.066)	0.37 (0.28)	0.67 (0.48)	-2.11 (1.89)
<i>Relevant Web Searches</i> δ	0.003* (0.001)	0.027 (0.017)	0.000 (0.000)	0.000 (0.000)
<i>Relevant Web Searches</i> _{t-1}	0.005*** (0.001)	0.016+ (0.006)	-0.004 (0.005)	0.028 (0.020)
<i>Carbon Price</i> δ	0.024+ (0.011)	0.056 (0.032)	0.015 (0.020)	-0.76 (1.15)
<i>Carbon Price</i> _{t-1}	0.026 (0.013)	0.11 (0.060)	-0.10 (0.081)	-0.24 (0.21)
<i>Constant</i>	-0.77+ (0.29)	-2.61 (1.26)	1.75 (1.53)	2.56 (2.72)
N	1094	983	2849	2849
Firms	38	38	37	37
Fixed effects	yes	yes	yes	yes
R ²	0.16	0.031	0.023	0.001

Linear coefficients. Standard errors clustered on sector in parentheses. Firm, country and COP fixed effects estimated but not reported. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table A.10: The impact of UNFCCC decisions on the returns of EU ETS firms: Montreal (2005) and Nairobi (2006) COPs

	Montreal COP		Nairobi COP	
	(1)	(2)	(3)	(4)
<i>Good UNFCCC Outcome</i>	0.14** (0.040)	0.10** (0.030)	0.093** (0.027)	0.038** (0.011)
<i>National Elections</i>		0.052** (0.016)		0.11** (0.032)
<i>Domestic Policy</i>		0.29*** (0.069)		-0.11** (0.031)
<i>Relevant Web Searches δ</i>		-0.009*** (0.0025)		0.002** (0.000)
<i>Relevant Web Searches_{t-1}</i>		-0.017*** (0.004)		0.003** (0.000)
<i>Carbon Price δ</i>		0.049*** (0.013)		-0.016** (0.004)
<i>Carbon Price_{t-1}</i>		0.056*** (0.014)		-0.020** (0.005)
<i>Constant</i>	-0.074*** (0.0042)	-0.59*** (0.13)	-0.11*** (0.0050)	0.073 (0.053)
N	1050	676	1026	760
Firms	38	38	38	38
Fixed effects	yes	yes	yes	yes
R ²	0.030	0.24	0.052	0.24

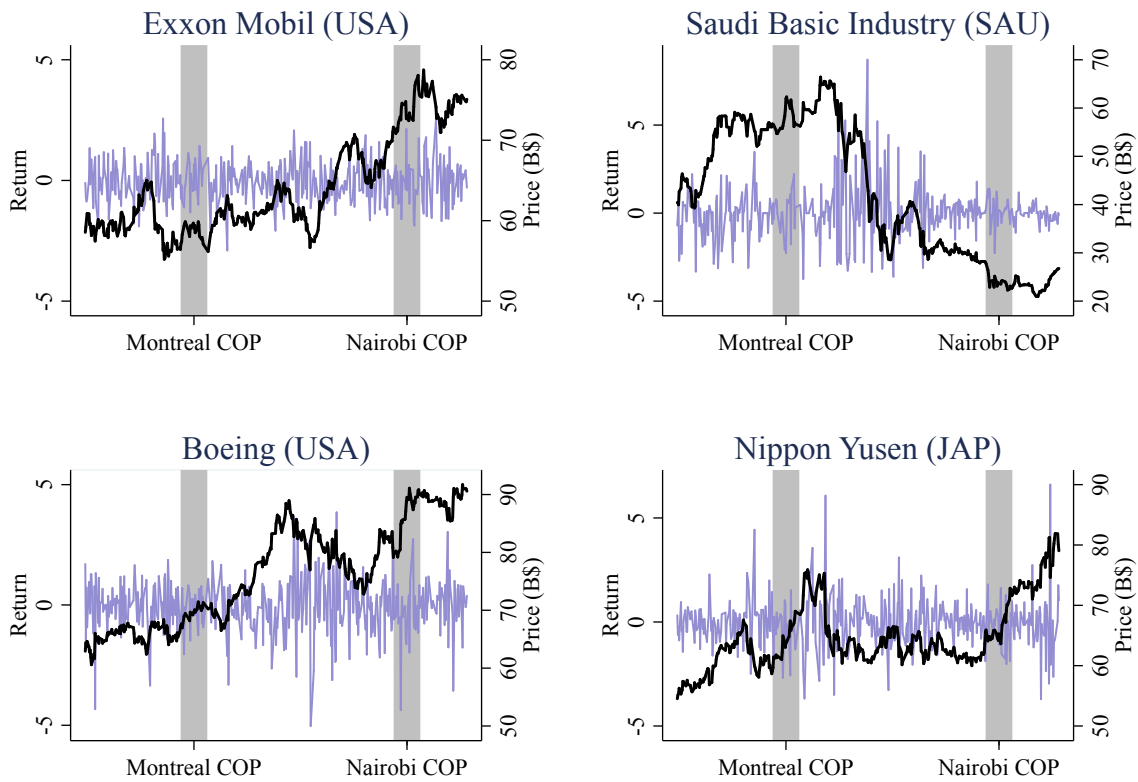
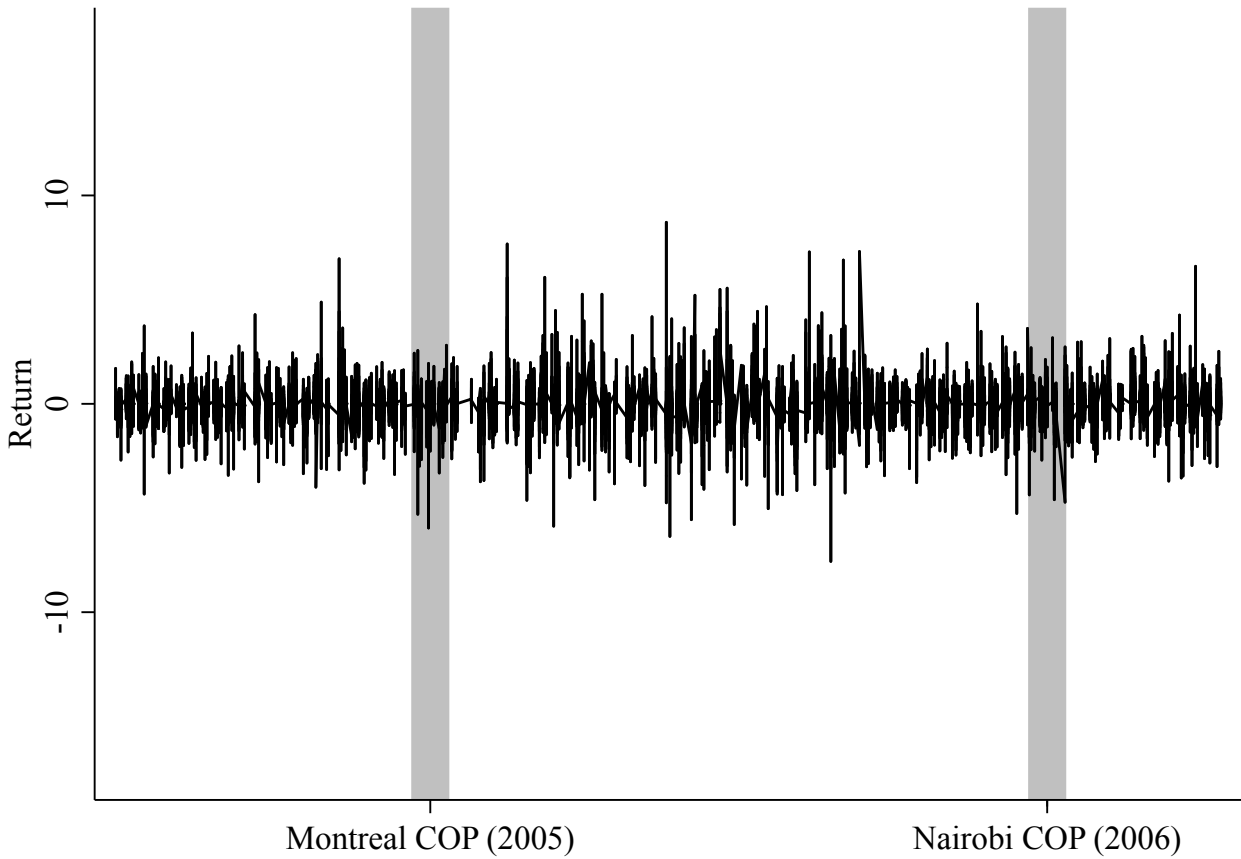
Linear coefficients. The outcome for Models 1 and 2 is the AAR calculated for the Montreal COP days, while the outcome for Models 3 and 4 is the AAR the Nairobi COP days. Firm, country and COP fixed effects estimated but not reported. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table A.11: Sampled non-EU ETS companies

SAUDI BASIC Ind. (SAU)	DOW CHEMICALS (USA)
MONDELEZ INTERNATIONAL (USA)	ARCHER DANIELS MIDLAND (USA)
FEMSA (MEX)	PEPSI Co. (USA)
FORD MOTOR (USA)	GENERAL MOTORS (USA)
DENSO (JAP)	HYUNDAI MOBIS (SKR)
MEDTRONIC (USA)	BAXTER INTERNATIONAL (USA)
INVENTEC (TWN)	NCR (USA)
FLUOR (USA)	SINOHYDRO GROUP (CHN)
PHILIP MORRIS INTERNATIONAL (USA)	JAPAN TOBACCO (JAP)
CHINA NATIONAL BUILDING (CHN)	CEMEX (MEX)
PFIZER (USA)	MERCK & Co (USA)
PPG INDUSTRIES (USA)	SHIN-ETSU CHEMICAL (JAP)
SUMITOMO CHEMICAL (JAP)	CELANESE (USA)
BOEING (USA)	LACKHEED MARTIN (USA)
ELI LILLY & Co (USA)	ABBOTT LABS (USA)
CHINA SHENHUA ENERGY (CHN)	FREEPORT-MCMORRAN COPPER (USA)
CHEVRON (USA)	GAZPROM (RUS)
PRETROCHINA (CHN)	EXXON MOBIL (USA)
ROSNEFT (RUS)	PETROBRAS (BRA)
FANUS (JAP)	ROCKWELL AUTOMATION (USA)
MANILA ELECTRIC (PHL)	FORTIS (CAN)
HONEYWELL INTERNATIONAL (USA)	3M (USA)
DUKE ENERGY (USA)	BGE (USA)
NIPPON YUSEN (JAP)	SHANGHAI INTERNATIONAL PORT (CHN)
KOREA ELECTRIC POWER (SKR)	PUBLIC SERVICE ENTERPRISE (USA)
MONSANTO (USA)	PRAXAIR (USA)
SWIRE PACIFIC (CHN)	KEPPEL CORP (SGP)
SEMPRA ENERGY (USA)	TOKYO GAS (JAP)
DUKE ENERGY (USA)	EXELON (USA)
CHINA YANGTZE POWER (CHN)	ORIGIN ENERGY (AUS)
FEDERAL GRID of UES (RUS)	ATCO (CAN)
DUKE ENERGY (USA)	HUANENG POWER INTERNATIONAL (CHN)
AMERICAN ELECTRIC (USA)	PTT PCL (THA)
SURGUTNEFTEGAS (RUS)	PECO ENERGY (USA)
BOMBARDIER (CAN)	L-3 COMMUNICATIONS (USA)

The table lists the non-European firms that have matching market characteristics to the 38 EU according to the 2010 Forbes Global 2000 dataset. See main text for more details.

Figure A.3: Non-EU Firms' Average Returns and Prices, 2005-2007



The top plot shows the average stock return of the 58 selected non-EU ETS (non-European) firms. The bottom plots show the return and price series for a selection of these firms.

Table A.12: The Impact of UNFCCC decisions on non-EU firms' returns, 2005-07

	<i>AAR_{it} Models</i>		<i>AR_{it} Models</i>	
	(1)	(2)	(3)	(4)
<i>Good UNFCCC Outcome</i>	-0.037*	-0.034**	0.031	0.038
	(0.014)	(0.011)	(0.040)	(0.039)
<i>National Elections</i>		-0.068**		0.062 ⁺
		(0.021)		(0.033)
<i>Relevant Web Searches δ</i>		-0.001*		0.007
		(0.001)		(0.005)
<i>Relevant Web Searches_{t-1}</i>		-0.001		-0.001
		(0.001)		(0.002)
<i>Carbon Price δ</i>		-0.006		-0.001
		(0.005)		(0.033)
<i>Carbon Price_{t-1}</i>		-0.009*		-0.048**
		(0.004)		(0.018)
<i>Constant</i>	0.014***	-0.028	0.013*	0.37
	(0.0026)	(0.080)	(0.0056)	(0.41)
N	2394	1656	2058	1488
Firms	58	58	58	58
Fixed effects	yes	yes	yes	yes
R ²	0.008	0.004	0.001	0.004

Linear coefficients. Robust standard errors in parentheses. The outcome variable for Models 1 and 2 is AAR_{it} , while the outcome variable for Models 3 and 4 is AR_{it} . Firm, country and COP fixed effects estimated but not reported. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table A.13: The Impact of UNFCCC decisions on non-EU firms' returns, 2005-07 – Only Annex I countries

	<i>AAR_{it} Models</i>		<i>AR_{it} Models</i>	
	(1)	(2)	(3)	(4)
<i>Good UNFCCC Outcome</i>	-0.050** (0.010)	-0.043*** (0.006)	0.059 (0.054)	0.045 (0.054)
<i>National Elections</i>		-0.057* (0.031)		0.047+ (0.024)
<i>Relevant Web Searches δ</i>		-0.002*** (0.001)		0.003* (0.002)
<i>Relevant Web Searches_{t-1}</i>		-0.002*** (0.000)		0.001 (0.001)
<i>Carbon Price δ</i>		-0.007 (0.006)		0.009** (0.036)
<i>Carbon Price_{t-1}</i>		-0.011* (0.006)		0.002* (0.001)
<i>Constant</i>	0.019*** (0.002)	0.33** (0.10)	-0.010*** (0.001)	0.00 (0.00)
N	1862	1287	14028	10579
Firms	45	45	45	45
Fixed effects	yes	yes	yes	yes

Linear coefficients. Robust standard errors in parentheses. The outcome variable for Models 1 and 2 is AAR_{it} , while the outcome variable for Models 3 and 4 is AR_{it} . Firm, country and COP fixed effects estimated but not reported. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table A.14: Emission Trading Opinions among Firms: Additional Estimations

	(1) <i>Y: CDM/JI projects will eliminate need for internal abatement in EU ETS</i> (Survey year: 2007)	(2) <i>Y: CDM/JI is the most cost-efficient way to reduce emissions</i> (Survey year: 2007)	(S3) (Survey year: 2013)
<i>EU ETS regulated</i>	0.77 (0.90)	0.53** (0.09)	1.90* (0.88)
<i>Emission: 0.1 - 0.5 Mt</i>	-1.71*** (0.60)	0.21 (0.31)	
<i>Emission: 0.5 - 1.0 Mt</i>	-0.55 (0.43)	-0.091 (0.29)	-0.81 (0.63)
<i>Emission: 1.0 - 5.0 Mt</i>	-1.57*** (0.26)	-0.18 (0.61)	1.24 (1.04)
<i>Emission: 5.0 - 10.0 Mt</i>	-1.35*** (0.30)	0.10 (0.36)	-1.53** (0.53)
<i>Emission: > 10 Mt</i>	-1.28*** (0.24)	0.29 (0.25)	0.086 (0.54)
<i>EUA access</i>	0.47 (0.83)	0.11 (0.21)	
<i>Constant</i>	-0.67*** (0.26)	2.59*** (0.20)	1.63 (0.81)
<i>Sector dummies</i>	yes	yes	yes
<i>Country dummies</i>	yes	yes	yes
N	230	231	40
<i>Log-likelihood</i>	-117.2	-347.8	-29.8

The table reports additional regression results based on the Point Carbon data at the firm level. The first model reports coefficients from a probit model (Y is binary 1 ‘yes’ or 0 ‘no’), while the second and third models report coefficients from a linear model (Y is scaled from 1 ‘completely disagree’ to 5 ‘completely agree’). *EUA Access* is a binary variable that capture whether a firm was allocated EUAs; however, it is omitted in the third model because the question was not asked in the 2013 survey. The reference category for the *Emissions* variable is ‘0’ for 2007 year, while it is ‘0 - 0.5 Mt’ for the 2013 year. Standard errors are clustered at the sector level (note that sector categories in the surveys changed slightly between 2007 and 2013). * $p < .1$, ** $p < .05$, *** $p < .01$.